1.Quick Reference

This chapter provides a quick reference source of technical specifications and information for the KYMCO MXU 700i and MXU 500i models.

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Break In Procedure

A new ATV and an overhauled ATV engine require a "break-in" period. The first 10 hours (or 200 miles) are most critical to the life of this ATV. Proper operation during this break-in period will help assure maximum life and performance from the ATV.

During the first 10 hours (or 200 miles) of operation, always use less than 1/2 throttle. Varying the engine RPM during the break-in period allows the components to "load" (aiding the mating process) and then "unload" (allowing components to cool). Although it is essential to place some stress on the engine components during break-in, care should be taken not to overload the engine too often. Do not pull a trailer or carry heavy loads during the 10-hour break-in period.

When the engine starts, allow it to warm up properly. Idle the engine several minutes until the engine has reached normal operating temperature. Do not idle the engine for excessively long periods of time.

During the break-in period, a maximum of 1/2 throttle is recommended; however, brief full-throttle accelerations and variations in driving speeds contribute to good engine break-in.

After the completion of the break-in period, the engine oil and oil filter should be changed. Other maintenance after break-in should include checking of all prescribed adjustments and tightening of all fasteners.

General Information

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Gasoline - Oil - Lubricant

RECOMMENDED GASOLINE

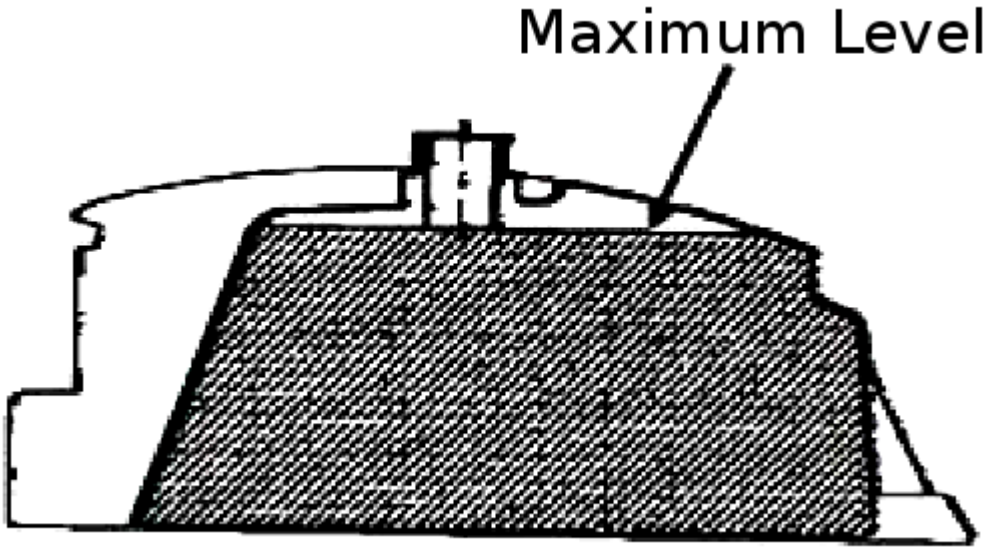
The recommended gasoline to use is 87 minimum octane regular unleaded. In many areas, oxygenates (either ethanol or MTBE) are added to the gasoline. Oxygenated gas containing up to 10% ethanol, 5% methane, or 5% MTBE are acceptable gas.

When using ethanol blended gasoline, it is not necessary to add a gasoline antifreeze since ethanol will prevent the accumulation of moisture in the fuel system.

FILLING THE GAS TANK

WARNING: Always fill the gas tank in a well-ventilated area Never add fuel to the ATV gas tank near any open flames or with the engine running. DO NOT SMOKE while filling the gas tank.

WARNING: Do not overflow gasoline when filling the gas tank. A fire hazard could materialize. Always allow the engine to cool before filling the gas tank.



Since gasoline expands as its temperature rises, the gas tank must be filled to its rated capacity only. Expansion room must be maintained in the tank particularly if the tank is filled with cold gasoline and then moved to a warm area.

RECOMMENDED OIL

CAUTION: Any oil used in place of the recommended oil could cause serious engine damage. Do not use oils which contain graphite or molybdenum additives. These oils can adversely affect clutch operation. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils.

Engine Oil (Recommended)	SAE 5W-30

RECOMMENDED FRONT DIFFERENTIAL/REAR

DRIVE LUBRICANT

The recommended lubricant is KYMCO Gear Lube or an equivalent gear lube which is SAE approved 80W-90 hypoid. This lubricant meets all of the lubrication requirements of the KYMCO ATV front differentials and rear drives.

CAUTION: Any lubricant used in place of the recommended lubricant could cause serious front differential/rear drive damage.

Genuine Parts

When replacement of parts is necessary, use only genuine KYMCO ATV parts. They are precision-made to ensure high quality and correct fit. Refer to the appropriate Illustrated Parts Manual for the correct part number, quantity, and description.

Preparation For Storage

CAUTION: Prior to storing the ATV. it must be properly serviced to prevent rusting and component deterioration.

KYMCO recommends the following procedure to prepare the ATV for storage.

1. Clean the seat cushion (cover and base) with a damp cloth and allow it to dry.

2. Clean the ATV thoroughly by washing dirt, oil, grass, and other foreign matter from the entire ATV. Allow the ATV to dry thoroughly. DO NOT get water into any part of the engine or air intake.

3. Either drain the gas tank or add Fuel Stabilizer to the gas in the gas tank. Remove the air filter housing cover and air filter. Start the engine and allow it to idle; then using KYMCO Engine Storage Preserver, rapidly inject the preserver into the air filter opening for a period of 10 to 20 seconds; then stop the engine. Install the air filter and housing cover.

CAUTION: If the interior of the air filter housing is dirty, clean the area before starting the engine.

4. Empty the fuel in the fuel tank.

5. Plug the exhaust outlet on the muffler with a clean cloth.

6. Apply light oil to the upper steering post bushing and plungers of the shock absorbers.

7. Tighten all nuts, bolts, cap screws, and screws. Make sure rivets holding components together are tight. Replace all loose rivets. Care must be taken that all calibrated nuts, cap screws, and bolts are tightened to specifications.

8. Disconnect the battery cables; then remove the battery, clean the battery posts and cables, and store in a clean, dry area.

9. Store the ATV indoors in a level position.

CAUTION: Avoid storing outside in direct sunlight and avoid using a plastic cover as moisture will collect on the ATV causing rusting.

Preparation After Storage

Taking the ATV out of storage and correctly preparing it will assure many miles and hours of trouble-free riding. KYMCO recommends the following procedure to prepare the ATV.

1. Clean the ATV thoroughly.

2. Clean the engine. Remove the cloth from the muffler.

3. Check all control cables for signs of wear or fraying. Replace if necessary.

4. Change the engine/transmission oil and filter.

5. Charge the battery; then install. Connect the battery cables.

Caution: The ignition switch must be in the OFF position prior to installing the battery or damage may occur to the ignition system. Connect the positive battery cable first, then the negative.

6. Check the entire brake systems (fluid level, pads, etc.), all controls, lights, and headlight aim; adjust or replace as necessary.

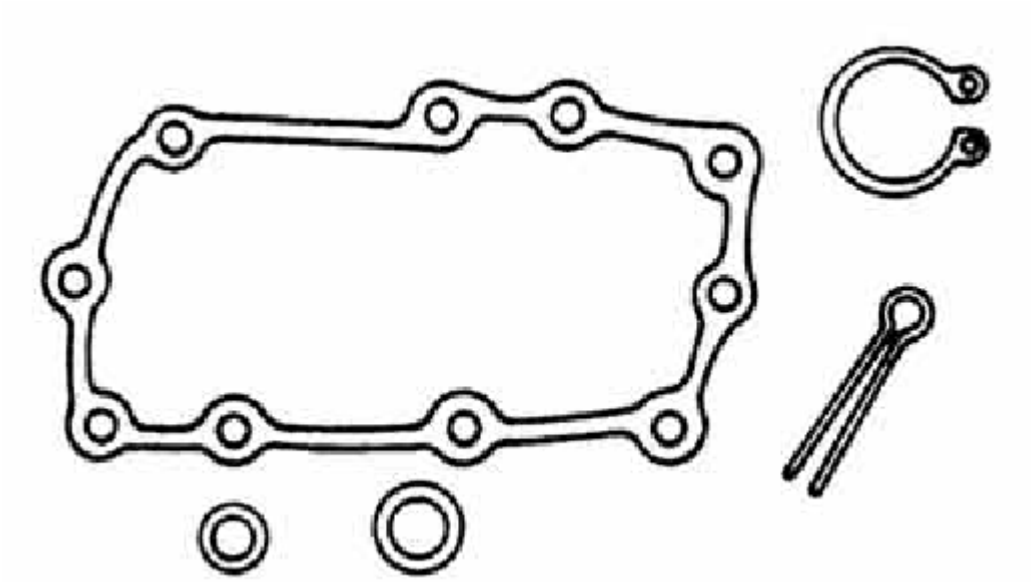
7. Tighten all nuts, bolts, cap screws, and screws making sure all calibrated nuts, cap screws, and bolts are tightened to specifications.

8. Check tire pressure, Inflate to recommended pressure as necessary.

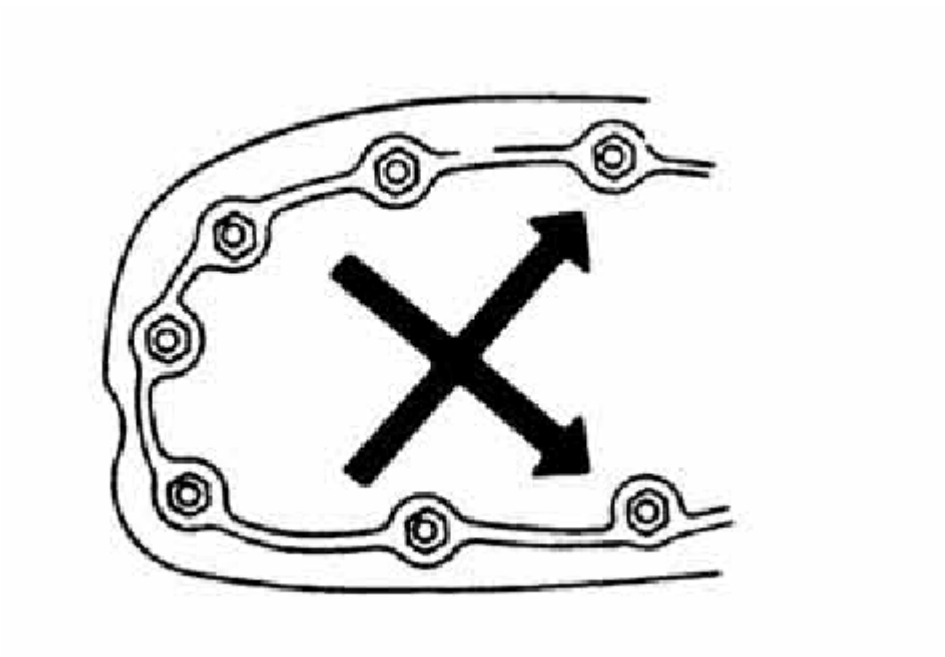
9. Make sure the steering moves freely and does not bind.

10.Check the spark plug. Clean or replace as necessary.

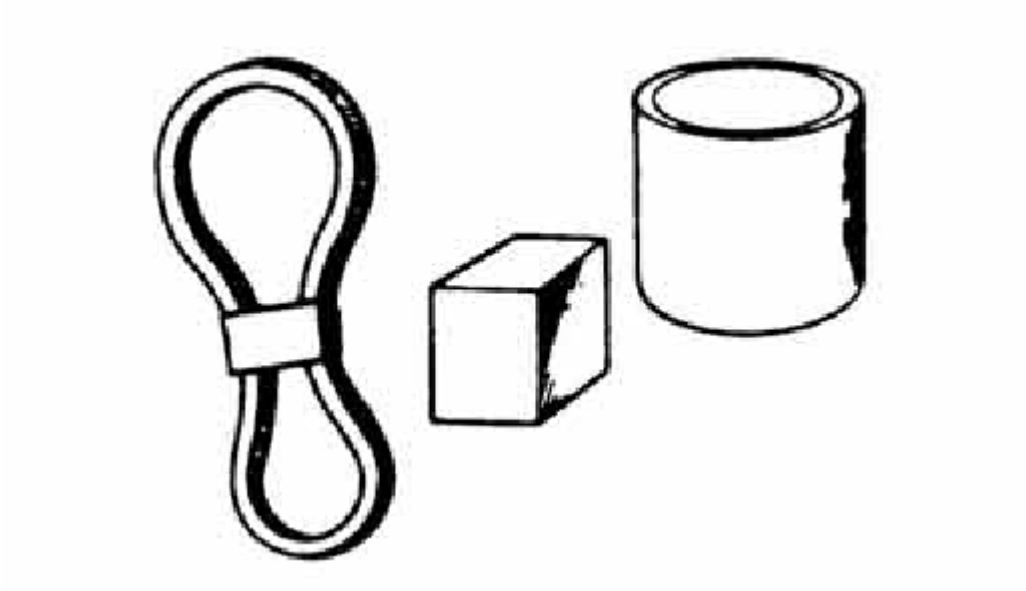
General Service Instructions



Make sure to install new gaskets, O-rings, circlips, cotter pins, etc. when reassembling.

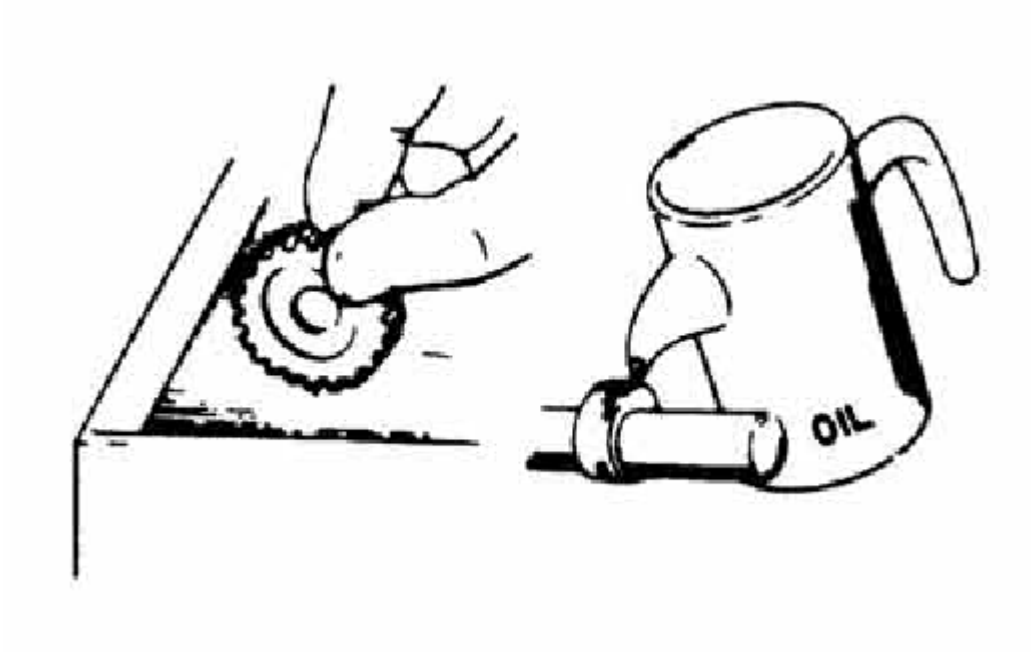


When tightening bolts or nuts, begin with larger-diameter and move to smaller ones. Tighten bolts evenly and tighten to the specified torque diagonally.

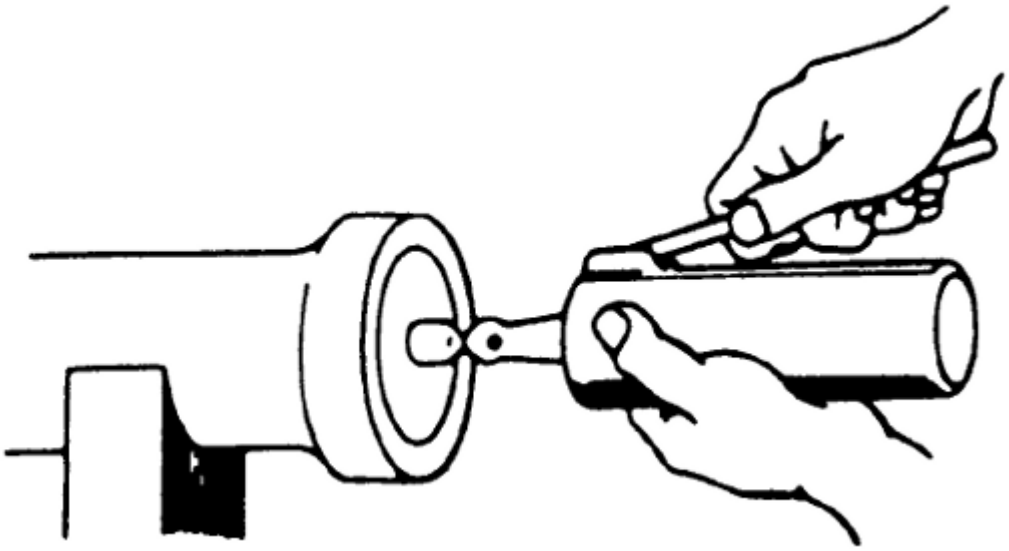


Use genuine parts and lubricants.

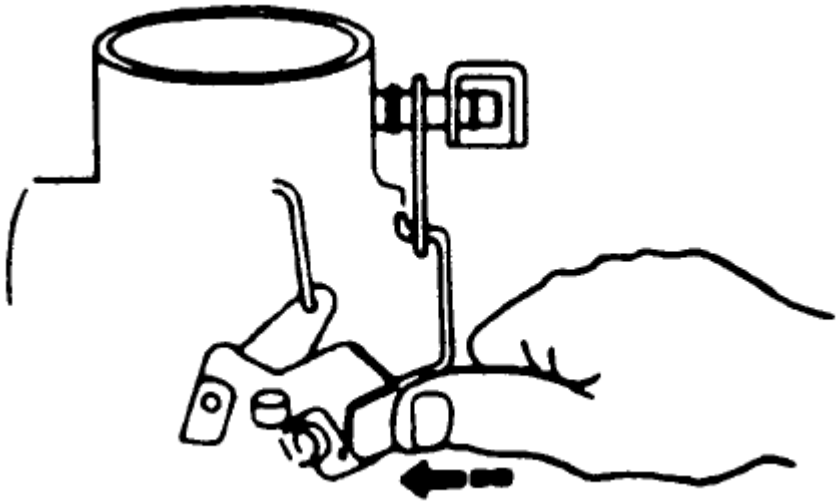
When servicing the motorcycle, be sure to use the indicated special tools for removal and installation.



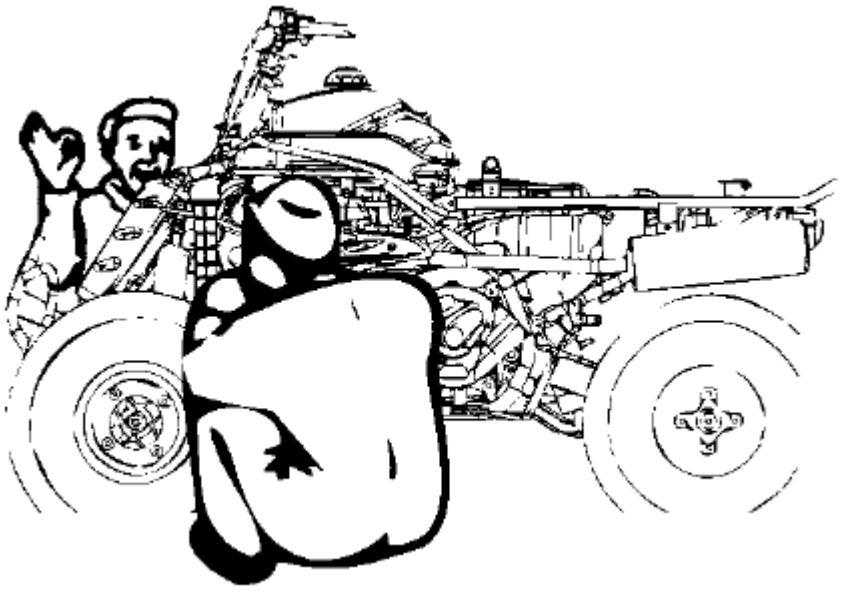
After disassembly, clean and inspect the removed parts. Lubricate sliding surfaces with engine oil before reassembly.



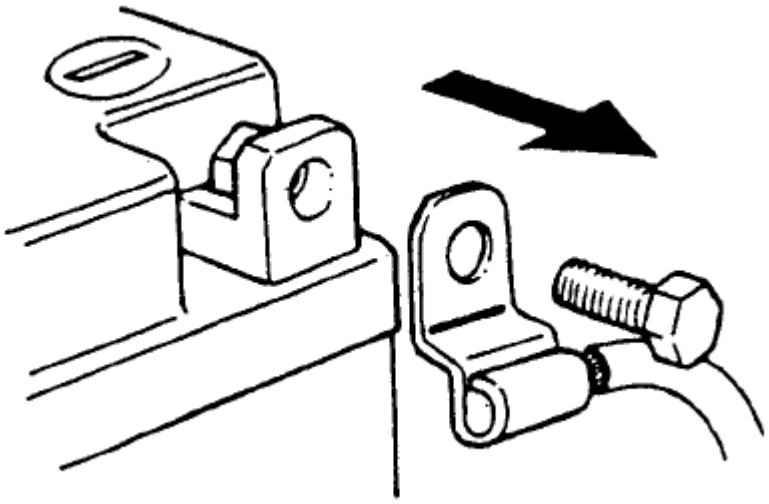
Apply or add designated greases and lubricants to the specified lubrication points.



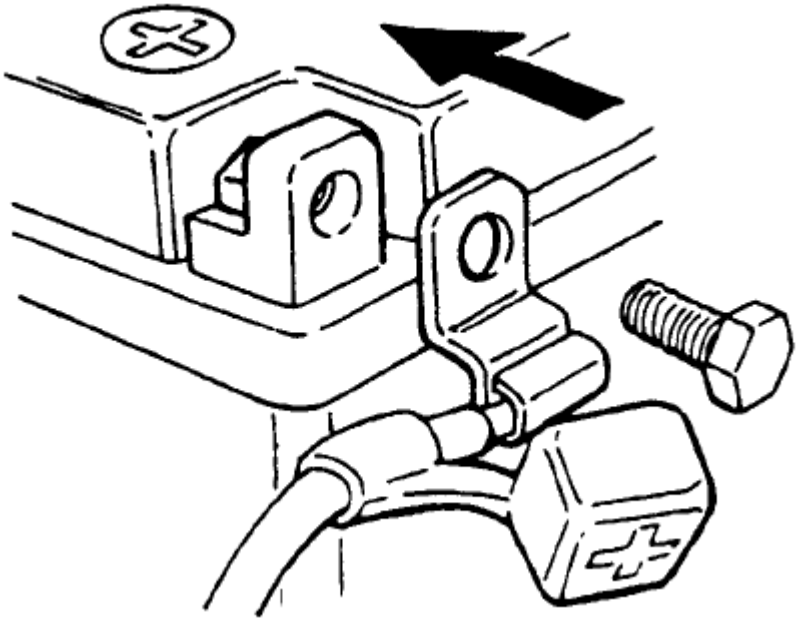
After reassembly, check all parts for proper tightening and operation.



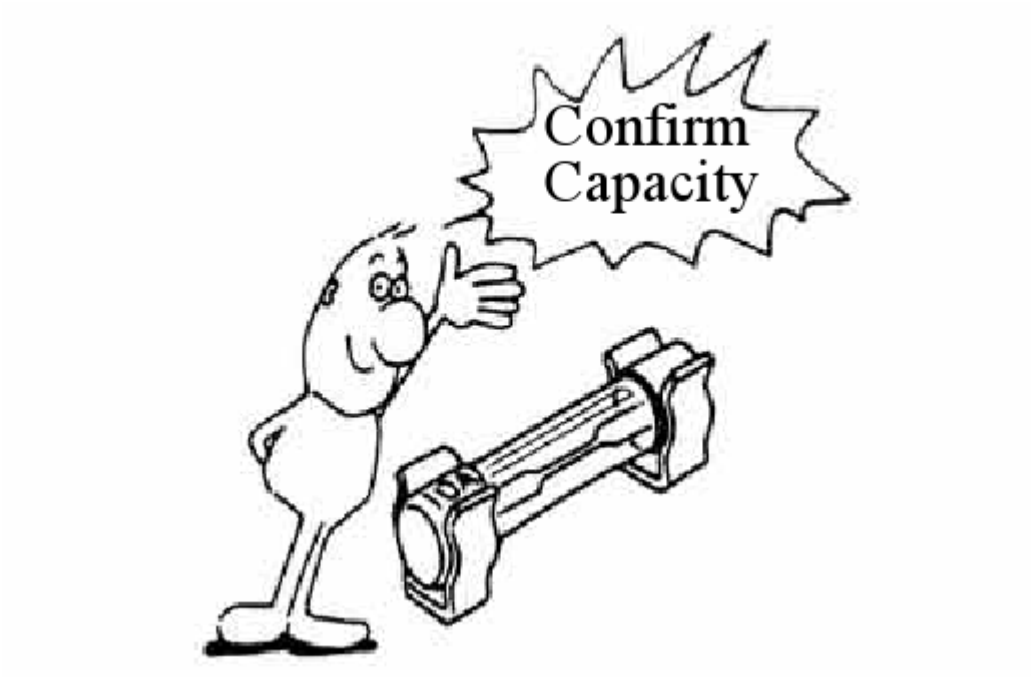
When two persons work together, pay attention to the mutual working safety.



Disconnect the battery negative (-) terminal before working on the vehicle.
When using a spanner or other tools, make sure not to damage the motorcycle surface.

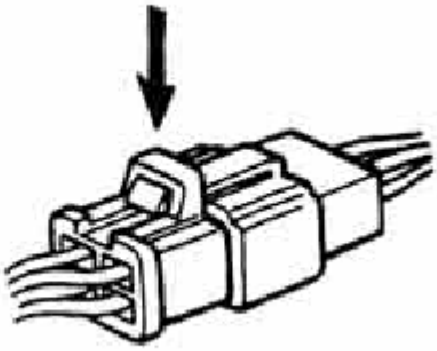


After working on the vehicle, check all connecting points, fasteners, and lines for proper connection and installation. When connecting the battery, the positive (+) terminal must be connected first. After connection, apply grease to the battery terminals. Terminal caps must be installed securely.

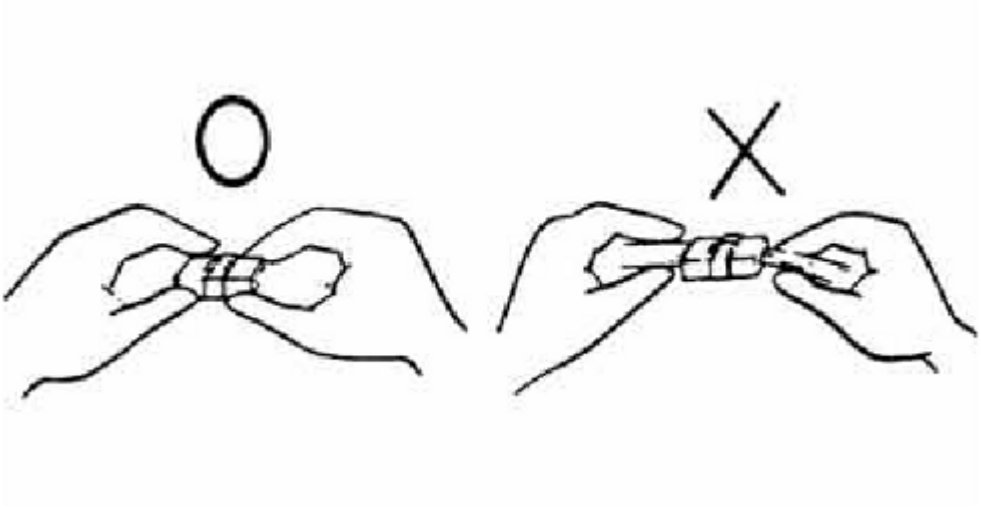


If the fuse is burned out find the cause and repair it. Replace the fuse with a new one according to the specified capacity.

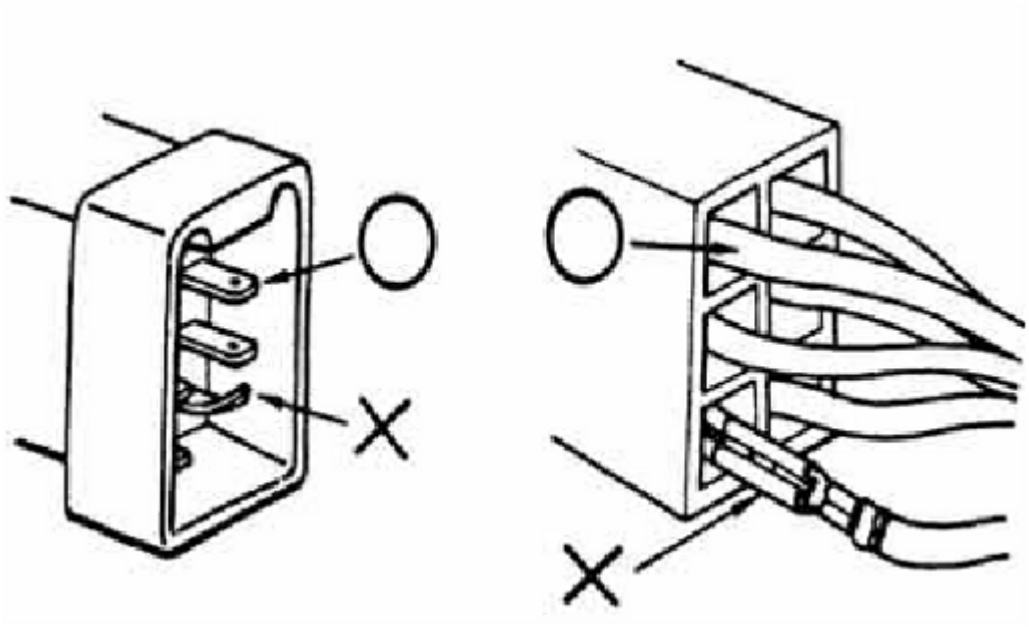
After working on the vehicle make sure terminal caps shall have been installed securely.



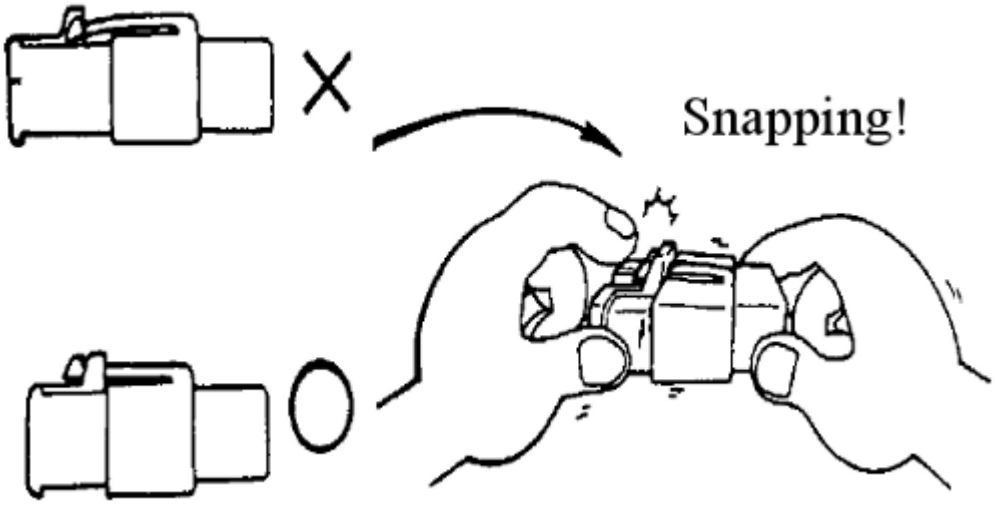
Disengage the lock on locking electrical connectors before attempting to unplug them.



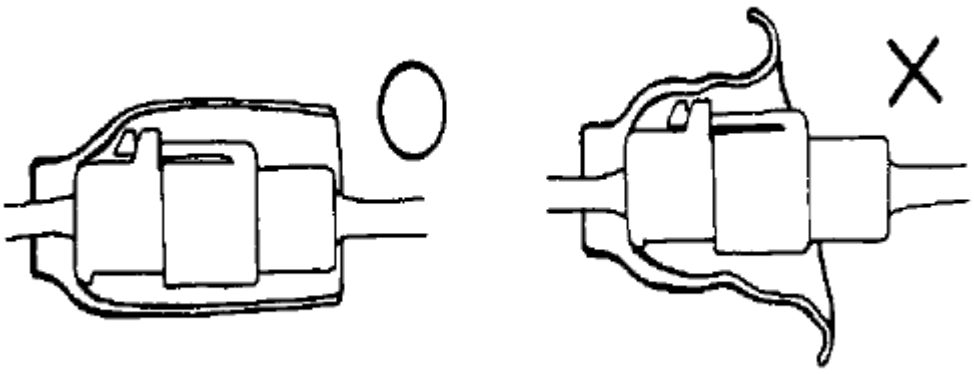
Hold the connector body when connecting or disconnecting it. Do not pull the connector wire.



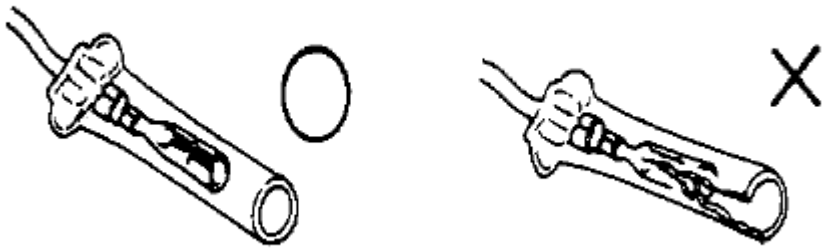
Check for faulty connector terminals. There shouldn't be any bent, protruding or loose terminals.



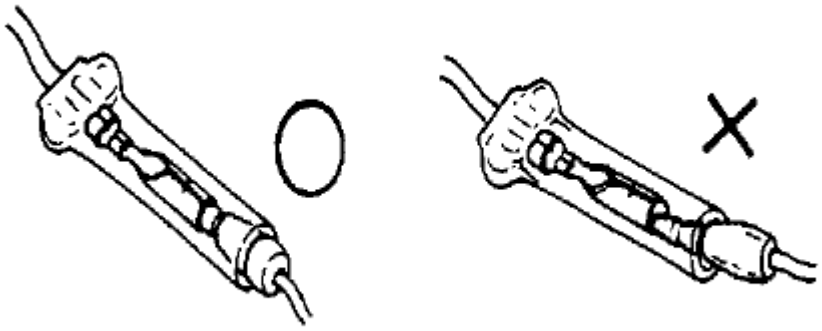
Make sure the connector is plugged in completely. Make sure the connector locks correctly if a lock is present. Make sure there are not any loose wires.



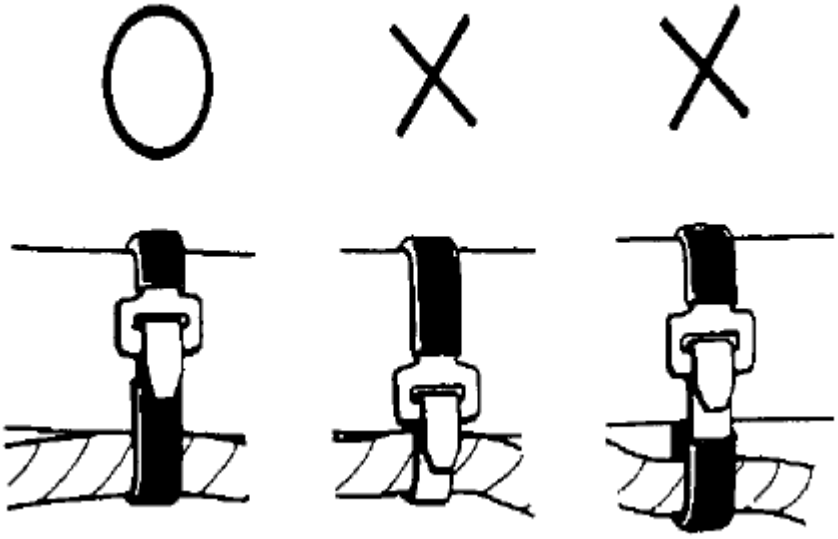
Before connecting an electrical connector, check for damaged terminal cover or loose negative terminal.



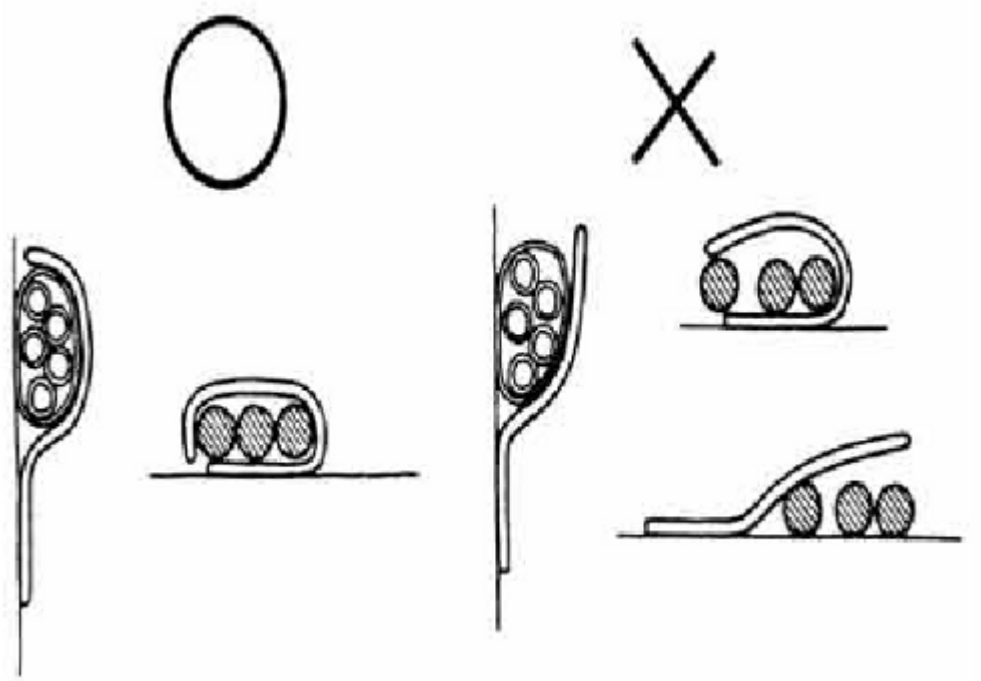
Check the bullet connector cover for proper coverage and installation.



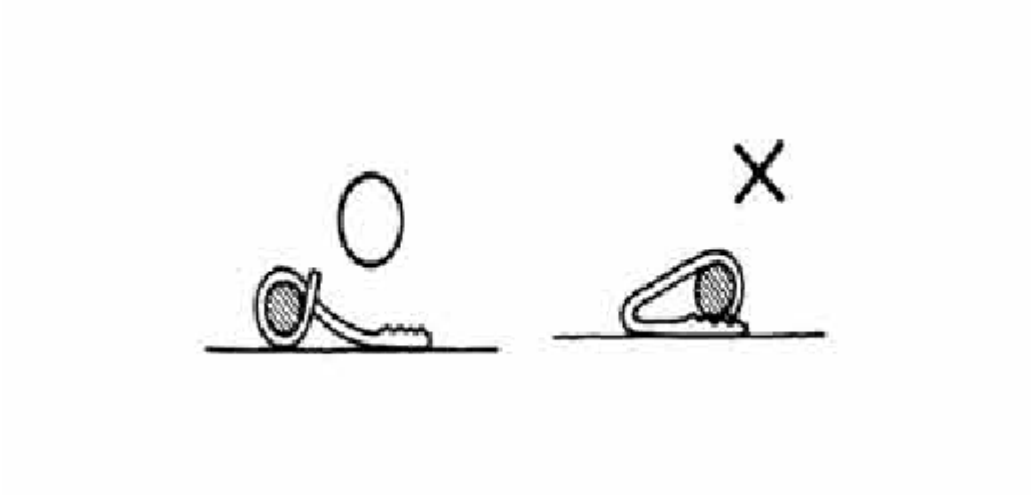
Join the terminals completely in bullet connectors. Check the cover for proper coverage. Do not make the cover opening face up.



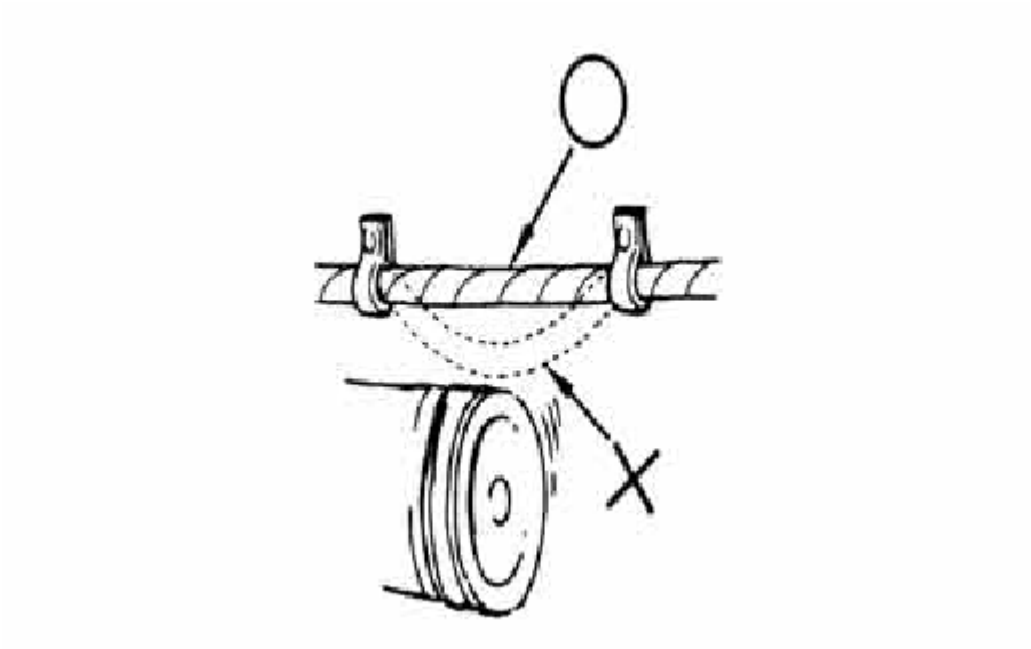
Secure wire harnesses to the frame with the respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wire harnesses.



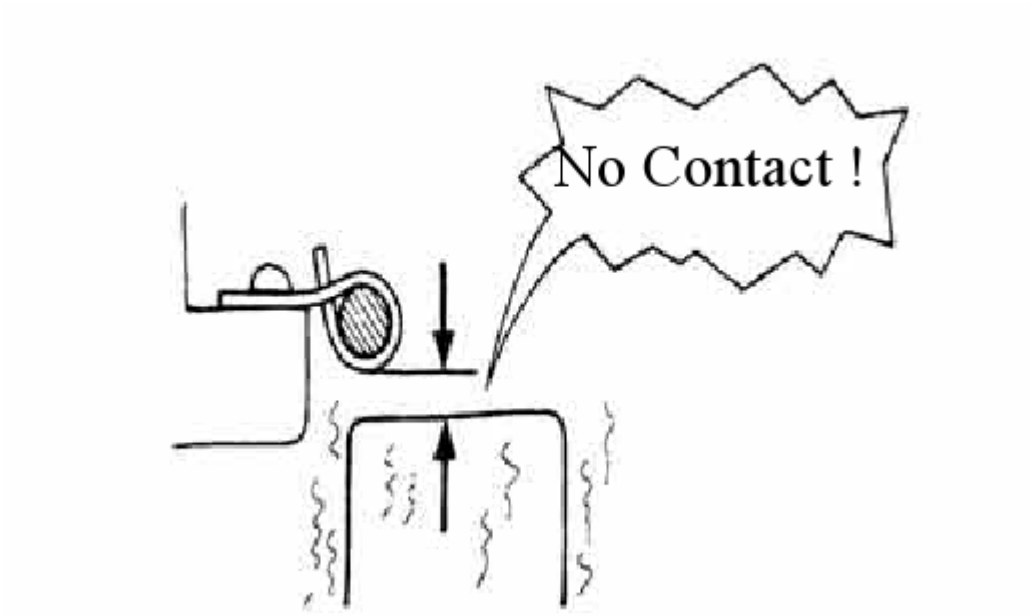
After clamping, check each wire to make sure it is secure.



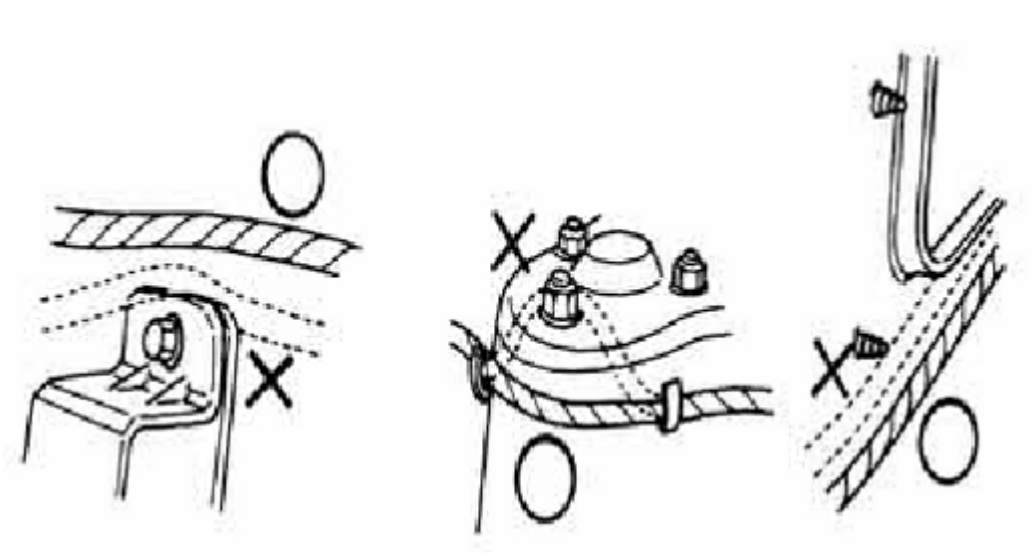
Do not squeeze wires against the weld or its clamp.



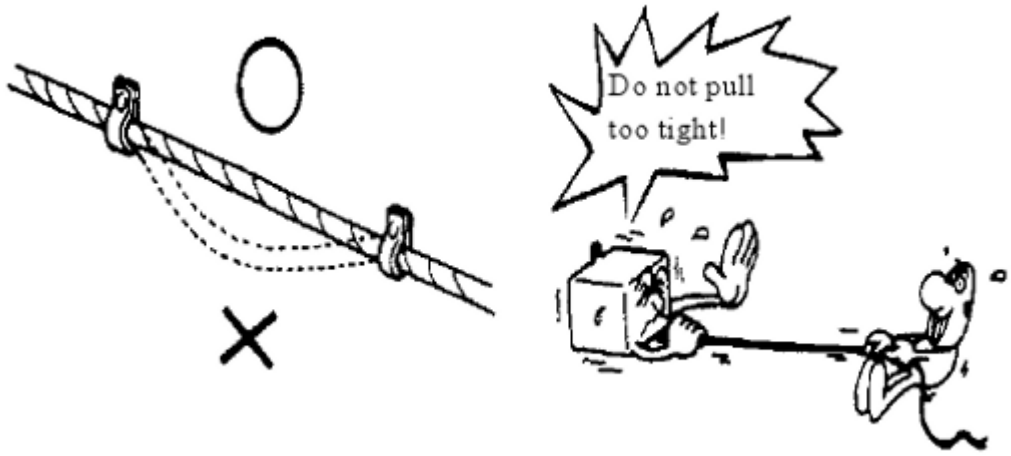
After clamping, check each harness to make sure that it is not interfering with any moving or sliding parts.



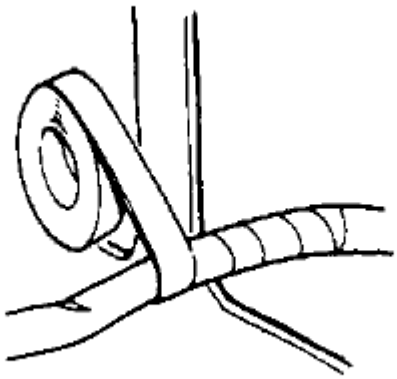
Secure the wire harness so that it will not make contact with parts which will generate high heat.



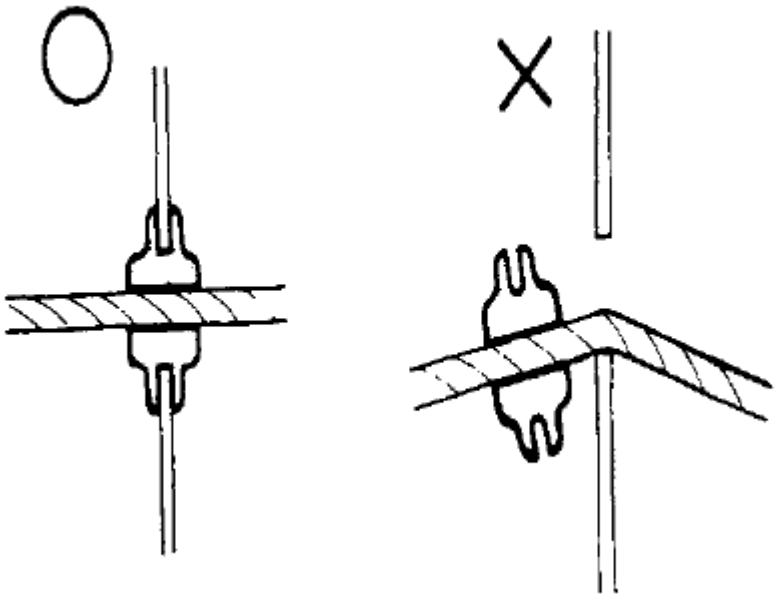
Route wire harnesses to avoid sharp edges or corners. Avoid the projected ends of bolts and screws. Route wire harnesses passing through the side of bolts and screws.



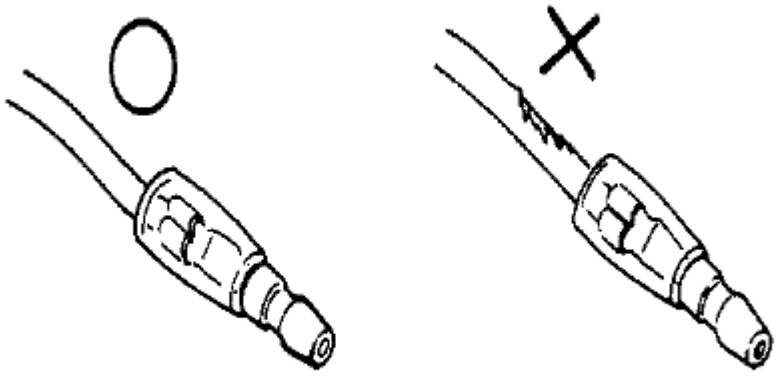
Route harnesses so they are neither pulled tight nor have excessive slack.



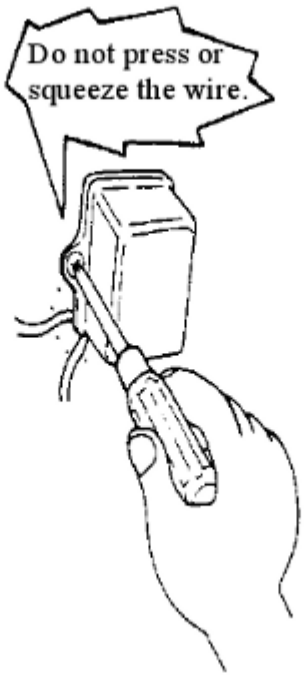
Protect wires and harnesses with electrical tape or tube if they contact a sharp edge or corner.



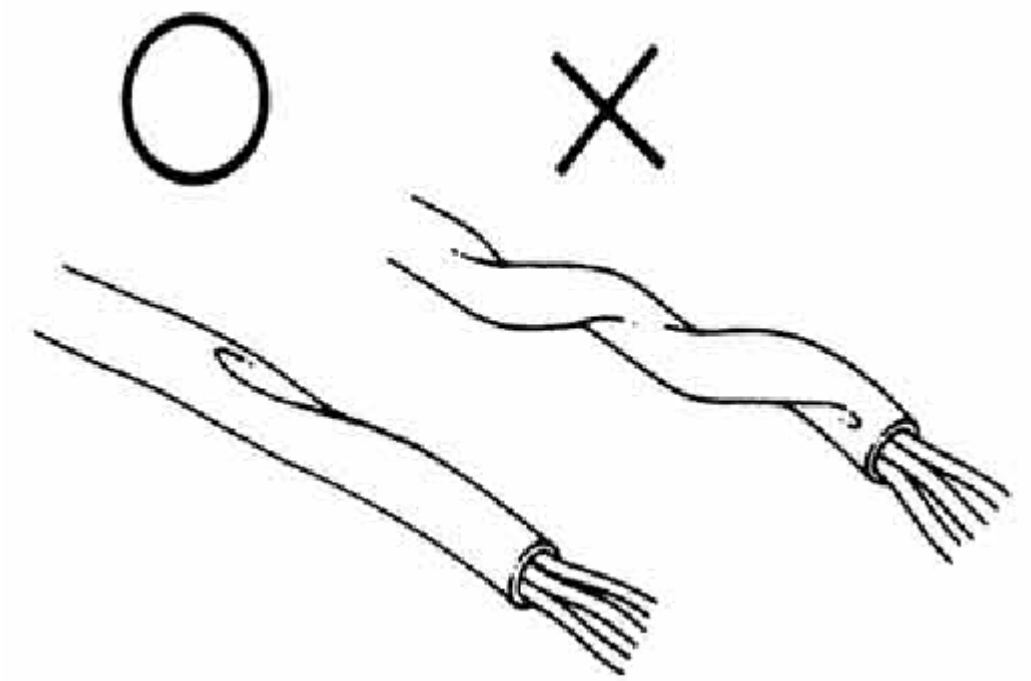
Make sure rubber wire grommets are installed correctly.



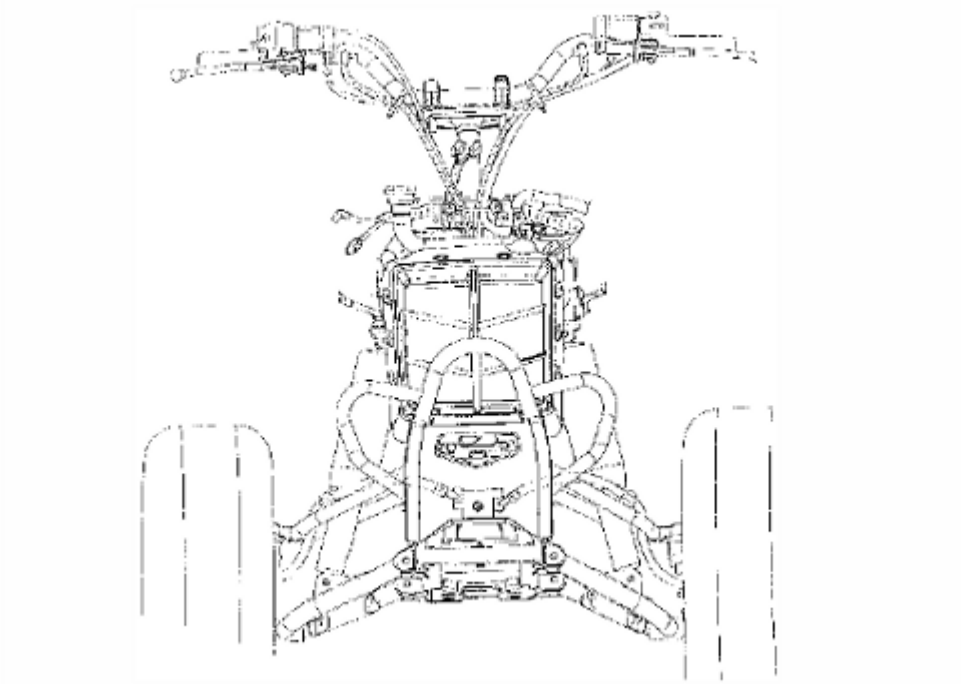
Do not break the sheath of wire. If a wire or harness has a broken sheath, repair it by wrapping it with protective tape or replace it if needed.



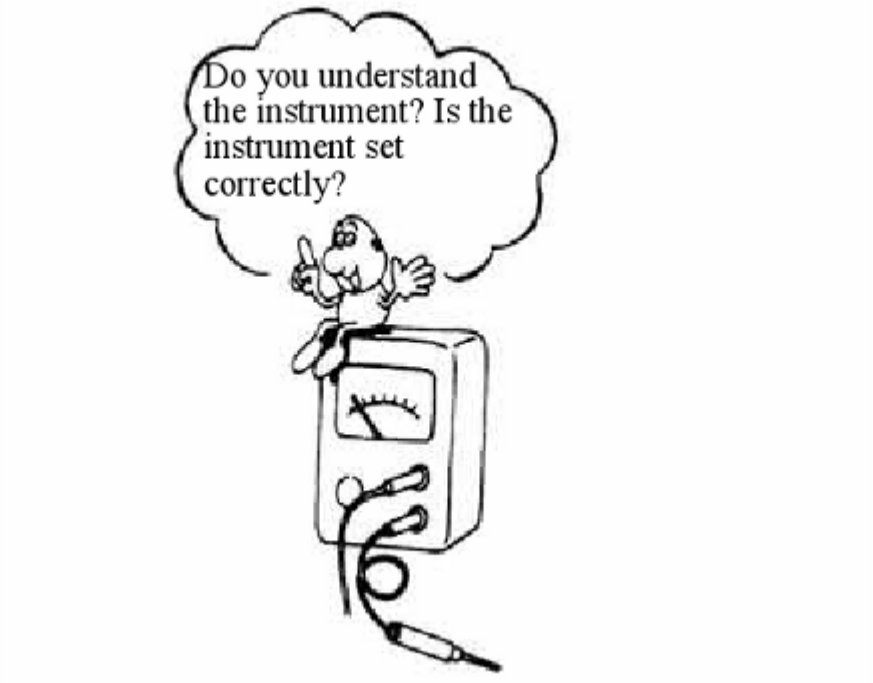
When installing other parts, do not press or squeeze the wires.



After routing, check that the wire harnesses are not twisted or kinked.



Wire harnesses routed along with handlebar should not be pulled tight, have excessive slack or interfere with adjacent or surrounding parts in all steering positions.



When a testing device is used, make sure to understand the operating methods thoroughly and operate according to the operating instructions.

Be careful not to drop any parts.

When rust is found on a terminal, remove the rust with sand paper or equivalent before connecting.

VIN and Engine Number Location

The VIN stamped into the front of the frame just in front of the front differential.

The engine number is located near the bottom of the left crankcase half.

Special Tools

Tool Name	Tool No.
Oil seal and bearing installer	A120E00014
Valve adjuster	A120E00080
Bearing puller	A120E00037
Valve spring compressor	A120E00040
Universal holder	A120E00056
Drive pulley holder	A120E00058

Tool Name	Tool No.
Clutch Spring Compressor Fittings 46mm HEX	A120E00057
Flywheel puller	A120E00060
Oil filter cartridge wrench 67 mm	A120E00052
Output shaft bearing nut wrench	A120E00066
Crankshaft bearing puller	A120E00068
LOCK NUT WRENCH	A120E00079

Tool Name	Tool No.
CLUTCH SPRING COMPRESSOR	A120E00053
Drive shaft puller	A120F00017
Pinion bearing lock nut wrench	A120F00020
LOCK NUT WRENCH M54 x 15 With 6 angle	A120F00025
PINION GEAR PULLER	A120F00026
BEARING PULLER	A120F00027

Specifications

General Specifications

Model No. MXU 500i		LDA0CA
Model No. MXU 700i		LAADAA(US)
Overall length		2210 mm
Overall width		1220 mm
Overall height		1265 mm
Wheel base		1297 mm
Engine type		4 stroke D.O.H.C.
Displacement	MXU 500i	498.5 cc
	MXU 700i	694.6 cc
Fuel used		92# nonleaded gasoline
Dry weight	Front wheel	170 kg
	Rear wheel	159 kg
	Total	329 kg
Curb weight	Front wheel	178 kg
	Rear wheel	169 kg
	Total	349 kg
Tires (standard models)	Front wheel	AT25 X 8-12
	Rear wheel	AT25 X 10-12
Ground clearance		265 mm
Min. turning radius		3450 mm

Tires (LE models)	Front wheel	AT 26 X 9-14
	Rear wheel	AT 26 X 11-14

Starting system	Electric

Type		Gasoline, 4-stroke
Cylinder arrangement		Single cylinder
Combustion chamber type		Semi-sphere
Valve arrangement	MXU 500i	DOHC, chain drive
	MXU 700i	SOHC, chain drive
Bore x stroke	MXU 500i	92 X 75 mm
	MXU 700i	102 X 85 mm
Compression ratio		10.5:1
Compression pressure		15 kg/cm^2 (213 psi)
Intake valve (at 1mm lift) MXU 500i	Opens	-1° BTDC
	Closes	48° ABDC
Exhaust valve (at 1mm lift) MXU 500i	Opens	45° BBDC
	Closes	5° ATDC
Intake valve (at 1mm lift) MXU 700i	Opens	-5° BTDC
	Closes	54° ABDC
Exhaust valve (at 1mm lift) MXU 700i	Opens	50° BBDC
	Closes	3° ATDC
Valve clearance (cold)	Intake	0.1 mm
	Exhaust	0.1 mm
Idle speed (rpm)	MXU 500i	1400 ± 100 rpm
	MXU 700i	1500 ± 100 rpm
Cooling type		Liquid cooled

Lubrication type	Forced pressure & Wet sump
Oil pump type	Trochoid
Oil filter type	Full-flow filtration
Oil capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)
Air cleaner type & No	Wet type element
Fuel capacity	16.5 L

Throttle body	TYPE	KYMCO PTA1
	VENTURE DIA	38 mm
Ignition System	Type	Full transistor digital ignition
	Ignition timing	5° at idle rpm (MXU 500i) 10° at idle rpm (MXU 700i)
	Spark plug	CR7E (NGK)
	Spark plug gap	0.6~0.7 mm
Battery	Capacity	12V18AH

Clutch type		Wet, centrifugal automatic
Clutch operation system		Automatic (V-belt)
Primary reduction system		V-belt
Secondary reduction system		Shaft drive
Forward drive high radio		8.770~30.067
Forward drive low radio		16.279~55.814
Reverse drive ratio		13.381~45.878
FR/RR tire rolling circumference		1995/1995
Tire pressure	Front (standard)	0.35 kgf/cm^2 (35 Kpa, 5.0 psi)
	Rear (standard)	0.32 kgf/cm^2 (32Kpa, 4.5 psi)
	Front (LE)	0.7 kgf/cm^2 (70 Kpa, 10 psi)
	Rear (LE)	0.97 kgf/cm^2 (97 Kpa, 14 psi)
Turning angle	Left	41°
	Right	41°

Brake system type	Front	Disk brake
	Rear	Disk brake
Suspension type	Front	Dual A-Arm
	Rear	Dual A-Arm

Lubrication Specifications

ITEM		STANDARD	SERVICE LIMIT
Recommended engine oil		KYMCO 4-stroke oil or equivalent motor oil API service classification SJ Viscosity: SAE 5W-50	—
Oil pump rotor	Tip clearance	0.15 max	0.2
	Body clearance	0.15 - 0.2	0.25
	Side clearance	0.04 - 0.09	0.12

Lubrication type	Forced pressure & Wet sump
Oil pump type	Trochoid
Oil filter type	Full-flow filtration
Oil capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)

Front gear box oil	
Recommended oil:	SAE 80
At disassembly:	270 cc
At change:	250 cc
Rear gear box oil	
Recommended oil:	SAE 80
At disassembly:	250 cc
At change:	230 cc

Fuel Injection Specifications

ITEM		SPECIFICATIONS
Throttle body identification number		PTA1
Throttle cable free play		3 ~ 5 mm
Fuel injector resistance (at 20°C/68°F)		10.6 - 15.9 Ω
Fuel pump resistance (at 20°C/68°F)	Float at full position	About 101 Ω
	Float at empty position	About 3 Ω
Fuel pump standard pressure (at 80 L/Hr)		300 ± 10 kPa (43.5 psi)
Water temperature sensor resistance	At -20°C/-4°F	28.6 KΩ
	At 40°C/104°F	1.46 KΩ/3.51 KΩ ±1 0%
	At 100°C/212°F	0.176 KΩ
T-MAP sensor resistance (20°C) (1 and 2 pins)		1613 - 2544 Ω
Inductive ignition coil		Primary: 0.55-0.75 Ω
Throttle position sensor (TPS) resistance (at 20°C/68°F)		3500-6500 Ω (1.2 pin)
Crank position sensor resistance		96 -144 Ω
Roll sensor voltage	Standard	0.4 -1.4 V
	Over 65° (fall down)	3.7- 4.4 V

Engine Specifications

MXU 500i Engine

Item		Standard mm (in)	Service Limit
Valve clearance (cold)	IN	0.1 mm (0.004 in)	-
	EX	0.1 mm (0.004 in)	-
Cylinder head compression pressure		15 kg/cm^2(1500 kPa, 213 psi)	-
Cylinder head warpage		-	0.05 (0.002)
Camshaft runout		-	0.05 (0.002)
Camshaft cam height	IN	37.2614 (1.4905)	37.11 (1.4844)
	EX	37.0084 (1.4803)	36.86(1.4744)
Valve rocker arm I.D.	IN	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)
	EX	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)
Valve rocker arm shaft O.D.	IN	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)
	EX	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)
Rocker arm to shaft clearance		0.009 - 0.042 (0.0004 - 0.0017)	0.1 (0.004)
Valve stem O.D.	IN	4.975 - 4.99 (0.199 - 0.1996)	4.925 (0.197)
	EX	4.955 - 4.97 (0.1982 - 0.1988)	4.915 (0.1966)
Valve guide I.D.	IN	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
	EX	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	0.08 (0.0032)
	EX	0.03 - 0.057 (0.0012 - 0.0023)	0.1 (0.004)

Item		Standard mm (in)	Service Limit
Cylinder	I.D.	92.005 - 92.015 (3.6802 - 3.6806)	92.1 (3.684)
	Warpage	0.01 (0.0004)	0.05 (0.002)
	Taper	0.01 (0.0004)	0.1 (0.004)
	Out-of-round	0.01 (0.0004)	0.1 (0.004)

Piston	Ring-to-groove clearance	top	0.03 - 0.065 (0.0012 - 0.0026)	0.08 (0.003)
		Second	0.015 - 0.05 (0.0006 - 0.002)	0.065 (0.0026)
	Ring end gap	top	0.15 - 0.3 (0.006 - 0.012)	0.5 (0.02)
		Second	0.03 - 0.45 (0.012 - 0.018)	0.65 (0.026)
		Oil side rail	0.2 - 0.7(0.008 - 0.028)	1 (0.04)
	Piston O.D.		91.96 - 91.98 (3.6784 - 3.6793)	91.9 (3.676)
	Piston O.D. measuring position		10 mm from bottom of skirt	-
	Piston-to-cylinder clearance		0.01 - 0.045 (0.0004 - 0.0018)	0.1 (0.004)
	Piston pin hole I.D.		22.002 - 22.008 (0.8801 - 0.8803)	22.04 (0.8816)
Piston pin O.D.			21.994 - 22 (0.8798 - 0.88)	21.96 (0.8784)
Piston-to-piston pin clearance			0.002 - 0.014 (0.0001 - 0.0006)	0.02 (0.001)
Connecting rod small end I.D. bore			22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

Item	Standard mm (in)	Service Limit
Drive belt width	34.1 (1.364)	30.8 (1.232)
Clutch shoe thickness	1.5 (0.06)	1 (0.04)
Driven pulley spring	124.3 (4.972)	121.3 (4.852)
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)
	Connecting rod big end radial clearance		0 - 0.008 (0 - 0.00032)	0.05 (0.002)
	Runout		-	0.1 (0.004)

MXU700i Engine

Item		Standard mm (in)	Service Limit
Valve clearance (cold)	IN	0.1 mm (0.004 in)	-
	EX	0.18 mm (0.007 in)	-
Cylinder head compression pressure		15 kg/cm^2(1500 kPa, 213 psi)	-
Cylinder head warpage		-	0.05 (0.002)
Camshaft runout		-	0.05 (0.002)
Camshaft cam height	IN	37.9809 (1.4953)	-
	EX	37.3412 (1.4701)	-
Valve rocker arm I.D.	IN	12 - 12.018 (0.4724 - 0.4731)	-
	EX	12 - 12.018 (0.4724 - 0.4731)	-
Valve rocker arm shaft O.D.	IN	11.975 - 11.987 (0.471 - 0.4719)	-
	EX	11.975 - 11.987 (0.471 - 0.4719)	-
Rocker arm to shaft clearance		0.009 - 0.042 (0.0004 - 0.0017)	0.1 (0.004)
Valve stem O.D.	IN	5.975 - 5.99 (0.235 - 0.2358)	-
	EX	5.955 - 5.97 (0.2344 - 0.2350)	-
Valve guide I.D.	IN	6 - 6.012 (0.2362 - 0.2367)	-
	EX	6 - 6.012 (0.2362 - 0.2367)	-
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	-
	EX	0.03 - 0.057 (0.0012 - 0.0023)	-

Item		Standard
Valve Spring Free Length (IN and EX)	INNER	43 mm
	OUTER	37.5 mm

Item		Standard mm (in)	Service Limit
Cylinder	I.D.	102 - 102.01 (4.0158 - 4.0161)	102.1 (4.0197)
	Warpage	0.01 (0.0004)	0.05 (0.002)
	Taper	0.01 (0.0004)	0.1 (0.004)

	Out-of-round		0.01 (0.0004)	0.1 (0.004)
Piston	Ring-to-groove clearance	top	0.03 - 0.07 (0.0012 - 0.0028)	0.08 (0.003)
		Second	0.02 - 0.06 (0.0008 - 0.0024)	0.065 (0.0026)
	Ring end gap	top	0.25 - 0.35 (0.0098 - 0.0138)	0.5 (0.02)
		Second	0.7 - 0.9 (0.0276 - 0.0354)	-
		Oil side rail	0.2 - 0.7(0.008 - 0.028)	1 (0.04)
	Piston O.D.		101.975 - 101.985 (4.0148 - 4.0152)	-
	Piston O.D. measuring position		10 mm from bottom of skirt	-
	Piston-to-cylinder clearance		0.015 - 0.035 (0.0006 - 0.0014)	0.1 (0.004)
	Piston pin hole I.D.		23.006 - 23.012 (0.9057 - 0.9060)	23.04 (0.9071)
Piston pin O.D.			22.997 - 23 (0.9053 - 0.9055)	
Piston-to-piston pin clearance			0.006 - 0.015 (0.0002 - 0.0006)	0.02 (0.001)
Connecting rod small end I.D. bore			22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

Item	Standard mm (in)	Service Limit
Drive belt width	34.1 (1.364)	30.8 (1.232)
Clutch shoe thickness	1.5 (0.06)	1 (0.04)
Driven pulley spring	124.3 (4.972)	121.3 (4.852)
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)
	Connecting rod big end radial clearance		0 - 0.008 (0 - 0.00032)	0.05 (0.002)

	Runout	-	0.1 (0.004)

Cooling System Specifications

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.4 liter, 2.54 US qt. (MXU700i) 1.95 liter, 2.06 US qt. (MXU500i)
	Reserve tank	0.3 liter, 0.32 US qt.
Radiator cap relief pressure		90 kPa (0.9 kgf/cm^2, 12.8 psi)
Thermostat	Begin to open	69 - 73°C (156 - 163°F)
	Fully open	85°C (185°F)
	Valve lift	8 mm (0.3 in) minimum
Standard coolant concentration		1:1 mixture with soft water

COOLANT GRAVITY CHART											
	Temperature °C										
Coolant Concentration	0	5	10	15	20	25	30	35	40	45	50
5%	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.009	0.997
10%	1.018	1.107	1.017	1.016	1.015	1.014	0.013	1.011	1.009	1.007	1.005
15%	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20%	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25%	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30%	1.053	1.051	1.051	1.049	1.047	1.045	1.043	1.041	1.038	1.035	1.032
35%	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40%	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45%	1.080	1.078	1.076	1.074	1.072	1.069	1.056	1.063	1.062	1.057	1.054
50%	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55%	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60%	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

Wheel and Brake Specifications

Item		Standard		Service Limit
Wheel rim run out	Radial	—		2 mm (0.08 in)
	Axial	—		2 mm (0.08 in)
Toe in		0~15 mm	(0~0.59 in)	—

Item	Standard mm (in)	Service Limit
Brake disk thickness	FR: 4.0 (0.156) RR: 5.0 (0.195)	FR: 3 (0.12) RR: 4 (0.156)
Brake disk runout	—	0.3 (0.012)
Brake fluid	DOT-4	—

Electrical Specifications

ITEM			SPECIFICATIONS
Battery	Capacity		12V - 18 Ah
	Current leakage		0.5 Ma max.
	Voltage (20°C/68°F)	Full charged	13.0 - 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.8 A/5 - 10 h
		Quick	9 A/1 h
Alternator	Capacity MXU 500i		310 - 400 W/5000 rpm
	Capacity MXU 700i Standard		308 W/5000 rpm
	Capacity MXU 700i LE		500 W/5000 rpm
Charging coil resistance (20°C/68°F)			0.1 - 0.3 Ω

Item	Standard
Spark plug	NGK-CR7E
Spark plug gap	0.6 - 0.7 mm (0.024 - 0.028 in.)

Ignition system	Full transistor digital ignition
Ignition timing	5° at idle rpm (MXU 500i) 10° at idle rpm (MXU 700i)

Spark Pug Type	NGK CR7E
Spark Plug Cap	4000-6000 ohms
Ignition Coil Resistance (primary)	Less than 1 ohm (terminal to terminal)
Ignition Coil (primary/CDI) Peak Voltage	250-375 DC volts (black/yellow to black)
Crank Position Sensor Resistance	90-110 ohms (green/white to blue/yellow)
Stator Coil Resistance	Less than 1 ohm (yellow to yellow)
Peak Voltage (trigger)	7.8-9.3 volts (green/white to blue/yellow)
AC Generator (no load) Output	60 AC volts @ 3000 RPM (black to black)

Specifications are subject to change without notice.

Torque Specifications

Use the MXU 500i torque specs for the MXU 700i except for the specific MXU 700i Engine Torque Specs.

If a specific torque spec is not given consult the General Torque Specifications.

MXU500i Torque Specs

Item	Q'ty	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)	Remarks
MAINTENANCE:				
Spark plug	1	10	1.2 (12, 8.6)	
Tappet ADJ nut	4	5	0.9 (9, 6.5)	
Engine oil filter cap	1	30	1.5 (15, 11)	Apply oil
Engine oil filter cartridge	1	20	1 (10, 7.2)	Apply oil
Engine drain plug	1	12	2.5 (25, 18)	
LUBRICATION SYSTEM:				
Oil pump screw	1	4	0.3 (3, 2)	
Oil pipe bolt	2	16	3.5 (35, 25.2)	Apply oil
COOLING SYSTEM:				
Water pump bolt	2	6	1.3 (13, 9)	
Fan motor bolt	4	5	0.53 (5, 2.8)	
Fan motor switch	1	16	1.8 (17, 13)	

Item	Q'ty	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)	Remarks
CYLINDER HEAD:				

Cylinder head bolt	4	10	4.8 (48, 34.6)	Apply oil
Cylinder head bolt	9	8	2.3 (23, 17)	Apply oil
Cylinder head nut	2	6	1 (10, 7)	
Cylinder head cover	4	6	1 (10, 7)	
Breather separator bolt	3	6	1.3 (13, 9)	
Cam chain tensioner bolt	2	6	1.2 (12, 8.6)	
Tensioner sealing bolt	1	10	1 (10, 7)	
Rocker arm shaft	2	18	4.5 (45, 32.4)	Apply oil
Chain guide pivot bolt	2	8	2 (20, 15)	
Water joint bolt	2	6	1.2 (12, 8.6)	
CYLINDER:				
Cylinder bolt	2	6	1 (10, 7.2)	
DRIVE/DRIVEN PULLEY:				
Drive pulley nut	1	20	14 (140, 100.8)	Apply oil
Wet clutch nut	1	25	14 (140, 100.8)	
Driven pulley nut	1	16	10 (100, 72)	Apply oil
Driven pulley assembly plate nut	1	36	7.5 (75, 54)	
TRANSMISSION:				
Crankcase bolt	19	6	1.2 (12, 8.6)	Apply oil
Drive bevel gear nut	1	20	14 (140, 100.8)	Apply oil
Driven bevel gear nut	1	20	14 (140, 100.8)	Apply oil
Stopper lever bolt	1	8	2.5 (25, 18)	
Stopper lever boss nut	1	12	3 (30, 21.6))	
Shift came stopper plug	1	20	4.8 (48, 35)	
Output shaft bearing nut	1	85	11 (110, 79.2)	Apply oil
Drive shaft bearing bolt	4	8	3 (30, 21.6)	
STARTER SYSTEM:				
Starter pulley nut	1	14	5.5 (55, 40)	

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)	Remarks
MAINTENANCE:				

Rear drive gear oil drain bolt	1	8	2 (20, 15)	
Rear drive gear oil filler cap	1	30	1.5 (15, 11)	
Rear drive gear oil level check bolt	1	8	2 (20, 15)	
Front drive gear oil drain bolt	1	14	3.2 (32, 23)	
Front drive gear oil filler cap	1	18	3.5 (35 25.5)	
Front drive gear oil level check bolt	1	6	1 (10, 7.2)	
Tie-rod adjusting nut	4	10	3.5 (35, 25.5)	
Front wheel hub nut	2	18	7 (70, 50)	Castle nut
Rear wheel hub nut	2	16	10 (100, 72)	Castle nut
EXHAUST MUFFLER:				
Exhaust muffler mounting bolt	2	8	3.5 (35, 25)	
Exhaust pipe mounting nut	2	8	3.5 (35, 25)	
Exhaust muffler band bolt	1	8	2.1 (21, 15)	
ENGINE ASSEMBLY:				
Engine mounting bolt/nut	3	10	6 (60, 43.5)	
Engine hanger nut	4	8	3.5 (35, 25)	
DRIVE TRAIN:				
Front drive:				
Front propeller shaft bolt	3	10	4.5 (45, 32.4)	
Front drive gear case mounting bolt	2	10	4 (40, 29)	Apply threebond: 1215
Shifting fork shaft plug	1	8	1.5 (15, 11)	Apply threebond: 1215
Front drive gear case bolt	9	8	2.3 (23, 16.5)	Apply threebond: 1215
2WD/4WD shift motor mounting bolt	1	8	2.3 (23, 16.5)	Apply threebond: 1215
2WD/4WD shift motor mounting bolt	2	6	1.2 (12, 8.5)	
Rear drive:				
Rear drive gear case mounting nut	8	10	5.5 (55, 40)	Apply threebond: 1215
Rear drive gear case bolt	2	10	5 (49, 36)	Apply threebond:

				1215
Rear drive gear case bolt	6	8	2.5 (25, 19)	

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)	Remarks
STEERING :			
Handlebar and holder post	10	2.7 (27, 19)	
Upper/lower housing and frame	8	2.7 (27, 19)	
Steering knuckle and tie-rod	10	4.2 (42, 30)	
Steering stem and tie-rod	10	4.2 (42, 30)	
Tie-rod lock nut	10	2.5 (25, 18)	
Steering post lower pivot	10	5.5 (55, 40)	
Bearing flange and frame	10	2.8 (28, 20)	
WHEEL:	8	2.8 (28, 20)	
Front/rear wheel and hub	10	6.1 (61, 44)	
Front wheel hub and front halfshaft(CVJ)	22	28 (280, 202)	Castle nut
Rear wheel hub and rear halfshaft(CVJ)	22	28 (280, 202)	Castle nut
Front wheel hub and stud axle(2WD only)	22	28 (280, 202)	Castle nut
SUSPENSION:			
Front:			
Front shock upper joint and frame	10	4.8 (48, 35)	
Front upper arm and frame	10	4.8 (48, 35)	
Front lower arm and frame	10	4.8 (48, 35)	
Front shock joint and front upper arm	10	4.8 (48, 35)	
Front shock joint and front lower arm	10	4.8 (48, 35)	
Rear:			
Rear shock upper joint and frame	10	4.8 (48, 35)	
Rear upper arm and frame	10	4.8 (48, 35)	
Rear lower arm and frame	10	4.8 (48, 35)	
Rear shock joint and rear upper arm	10	4.8 (48, 35)	
Rear shock joint and rear lower arm	10	4.8 (48, 35)	
Stabilizer and frame	8	2.7 (27, 19)	
Stabilizer joint and stabilizer	10	5.5 (55, 40)	

Stabilizer joint and rear lower arm	10	5.5 (55, 40)	
BRAKE SYSTEM:			
Front brake disc and front hub	6	2.0 (20, 14)	
Rear brake disc and rear hub	8	3.5 (35, 25)	
Brake hose oil bolt	10	3.5 (35, 25)	
Master cylinder holder bolt	6	1.2 (12, 7)	
Secondary master cylinder holder	6	1.2 (12, 7)	

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Front caliper and knuckle	8	2.7 (27, 19)
Rear caliper and bracket	8	2.7 (27, 19)
Master cylinder cap screw	4	0.15 (1.5, 1.1)
Brake caliper bleed valve	8	0.55 (5.5, 4.0)
Brake pedal adjusting nut	6	0.9 (9, 6.5)
Rear disc holder and gear box	10	4.5 (45, 34)
FRAME		
Exhaust pipe and head	8	2.0 (20, 14)
Muffler bracket and frame	10	3.5 (35, 25)
Upper engine nut	10	6.0 (60, 43)
Front and rear lower engine nut	10	6.0 (60, 43)
Lower engine hanger	8	2.7 (27, 19)
Shift rod	8	2.7 (27, 19)
Front gear case and frame	10	5.3 (53, 38)
Rear gear case and frame	10	5.3 (53, 38)
Thermo switch ASSY	16	2.2 (22, 16)
Set start MAG		0.3 (3, 2)

MXU700 Engine Torque Specs

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
		N-m	ft-lb	
CRANKCASE SET	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M8 x 1.0	24.5	18	APPLY OIL
CYLINDER HEAD	BOLT UBS M10 x 196. 5	9.8	7.2	STUD SIDE
	NUT M10 x 1.0	47	34.7	APPLY OIL
	BOLT M6 x 1.0	11.8	8.7	APPLY OIL
	BOLT M6 x 1.0	11.8	8.7	APPLY OIL
	BOLT M8 x 1.25	10.8± 0.1	8	APPLY OIL
	NUT M8 x 1.25	24.5± 1 .2	18	APPLY OIL
ROCKER COVER	M6 x 1.0	9.8	7.2	
SPARK PLUG	M10 x 1.0	9.8-13.7	7.2-10.1	
TAPPET ADJ. NUT	M5 x 0.5	6.9-10.8	5.1-7.9	
TENSIONER LIFTER	SHF M6 x 1.0	9.8-13.7	7.2-10.1	
SHAFT ROCKER ARM	SPECIAL SCREW M18 x 1.5	39.2-49	28.9-36.1	
CAM CHAIN TENSIONER PIVOT	SPECIAL BOLT M18 x 1.25	17.7-21.6	13-15.9	
ACG ONE WAY	BOLT SOCKET M8x1.25	17.7-21 .6	13-15.9	APPLY THREAD LOCK
SPROCKET CAMSHAFT	SPECIAL BOLT M6 x 1.0	10.8-14.7	8-10.8	APPLY OIL
ACG FLYWHEEL	N.F. M14	49-58.9	36.1-43.4	
OIL FILTER	M20 x 1.5	7.8-11 .8	5.8-8.7	
HOLE CAP	M30 x 1.5	49-58.9	36.1-43.4	

NUT,FINAL SHAFT	M85X2.0	107.8	79.5	APPLY OIL
L CASE DRAIN PLUG	M12 x 1 .5	20-30	14.8	^^^
WET CLUTCH	M25 x 1.5	156.8	115.6	APPLY OIL
DRIVE FACE	M20 x 1.0	137.2	101.2	APPLY OIL
GUIDE COMP., CAM CHAIN	SPECIAL BOLT M8 x 1.25	17.7-21.6	13.1	
PULLEY,DRIVEN	M16 x 1.5	98	72.3	APPLY OIL
PIPE COMP., OIL	M16 x 1.5	34. 3	25.3	APPLY OIL
BEVEL GEAR, DRIVE	M20 x 1.0	137.2	101.2	APPLY OIL
BEVEL GEAR., DRIVEN	M20 x 1.0	137.2	101.2	APPLY OIL
04 BEARING	SPECIAL BOLT M8 x 1.25	27.5-31.4	20.3-23.1	

General Torque Specifications

General torque specifications are only to be used when specific torque specifications for a fastener are not provided. These specifications are for clean unlubricated threads. The size given is for thread diameter not bolt head size.

Item	Torque	
	kgf-m	ft-lb
5 mm bolt, nut	0.45 - 0.6	3.25 - 4.34
6 mm bolt, nut	0.8 - 1.2	5.79 - 8.68
8 mm bolt, nut	1.8 - 2.5	13.02 - 18.08
10 mm bolt, nut	3.0 - 4.0	21.70 - 28.93
12 mm bolt, nut	5.0 - 6.0	36.17 - 43.40
5 mm screw	0.45 - 0.6	3.25 - 4.34
6 mm screw, SH bolt	0.7 - 1.1	5.06 - 7.96
6 mm flange bolt, nut	1.0 - 1.4	7.23 - 10.13
8 mm flange bolt, nut	2.4 - 3.0	17.36 - 21.70
10 mm flange bolt, nut	3.0 - 4.5	21.70 - 32.55

Troubleshooting

- Engine and Fuel System
- Final Drive
- Electrical
- Brake
- Suspension and Steering

Engine and Fuel System

Troubleshooting

Problem: Engine will not start or is hard to start (Compression too low)	
Condition	Remedy
1. Valve clearance out of adjustment	1. Adjust clearance
2. Valve guides worn	2. Replace cylinder head
3. Valves mistimed	3. Adjust valve timing
4. Piston rings worn excessively	4. Replace rings
5. Cylinder bore worn	5. Replace - bore cylinder
6. Spark plug seating poorly	6. Tighten plug
7. Starter motor cranks too slowly - does not turn	7. Check - replace starter motor
Problem: Engine will not start or is hard to start (No spark)	
Condition	Remedy
1. Spark plug fouled	1. Clean replace plug

2. Spark plug wet	2. Clean - dry plug
3. Magneto defective	3. Replace magneto
4. Ignition coil defective	4. Replace ignition coil
5. High-tension lead open - shorted	5. Replace high tension lead
6. ECU defective	6. Replace ECU unit
Problem: Engine will not start or is hard to start (No fuel reaching the fuel Injector)	
Condition	Remedy
1. Gas tank vent hose obstructed	1. Clean vent hose
2. Throttle body obstructed	2. Clean Throttle body
3. Fuel hose obstructed	3. Clean - replace hose
4. Fuel filter obstructed	4. Clean - replace fuel filter
5. Fuel pump defective	5. Replace fuel pump
Problem: Engine stalls easily	
Condition	Remedy
1. Spark plug fouled	1. Clean plug
2. Magneto defective	2. Replace magneto
3. Throttle Body obstructed	3. Clean Throttle Body
4. Valve clearance out of adjustment	4. Adjust clearance
5. ECU unit defective	5. Replace ECU
Problem: Engine noisy (Excessive valve chatter)	
Condition	Remedy
1. Valve clearance too large	1. Adjust clearance
2. Valve spring(s) weak - broken	2. Replace spring(s)
3. Rocker arm - rocker arm shaft worn	3. Replace arm - shaft
4. Camshaft worn	4. Replace camshaft
5. Valve tappets worn	5. Replace tappets
Problem: Engine noisy (Noise seems to come from piston)	
Condition	Remedy
1. Piston - cylinder worn	1. Replace - service piston - cylinder
2. Combustion chamber carbon buildup	2. Clean chamber
3. Piston pin bore worn	3. Replace piston
4. Piston pin worn	4. Replace piston pin

5. Piston rings - ring groove(s) worn	5. Replace rings - piston

Problem: Engine noisy (Noise seems to come from timing chain)	
Condition	Remedy
1. Chain stretched	1. Replace chain
2. Sprockets worn	2. Replace sprockets
3. Tension adjuster malfunctioning	3. Repair - replace adjuster
Problem: Engine noisy (Noise seems to come from crankshaft)	
Condition	Remedy
1. Bearing worn - burned	1. Replace bearing
2. Lower rod-end bearing worn - burned	2. Replace crankshaft
3. Connecting rod side clearance too large	3. Replace crankshaft
Problem: Engine noisy (Noise seems to come from transmission)	
Condition	Remedy
1. Gears worn - rubbing	1. Replace gears
2. Splines worn	2. Replace shaft(s)
3. Primary gears worn - rubbing	3. Replace gears
4. Bearings worn	4. Replace bearings
5. Bushing worn	5. Replace bushing
Problem: Engine noisy (Noise seems to come from secondary bevel gear and final driven shaft)	
Condition	Remedy
1. Drive or driven bevel gears damaged or worn	1. Replace gears
2. Backlash excessive	2. Adjust backlash
3. Tooth contact improper	3. Adjust contact
4. Bearing damaged	4. Replace bearing
5. Gears worn - rubbing	5. Replace gears
6. Splines worn	6. Replace tappets
7. Final driven shaft thrust clearance too large	7. Replace thrust washer(s)
Problem: Engine idles poorly	
Condition	Remedy
1. Valve clearance out of adjustment	1. Adjust clearance
2. Valve seating poor	2. Replace - service seat - valves

3. Valve guides defective	3. Replace cylinder head
4. Rocker arms - arm shaft worn	4. Replace arms - shafts
5. Magneto defective	5. Replace magneto
6. ECU unit defective	6. Replace ECU unit
7. Spark plug fouled - gap too wide	7. Adjust gap • replace plug
8. Ignition coil defective	8. Replace ignition coil
9. Fuel Pump defective	9. Replace Fuel Pump
10. Fuel injector obstructed	10. Clean Fuel injector
11. CO screw setting improper	11. CO screw can't allowed to be adjusted
12. Fuel injector obstructed	12. Replace fuel injector

Problem: Engine runs poorly at high speed	
Condition	Remedy
1. High RPM "cut out" against RPM limiter	1. Shift into higher gear - decrease speed
2. Valve springs weak	2. Replace springs
3. Valve timing out of adjustment	3. Adjust timing
4. Cams - rocker arms - tappets worn	4. Replace cams - arms - tappets
5. Spark plug gap too narrow	5. Adjust gap
6. Ignition coil defective	6. Replace ignition oil
7. Fuel Injector obstructed	7. Clean Fuel Injector
8. Air cleaner element obstructed	8. Clean element
9. Fuel hose obstructed	9. Clean or replace hose
10. Fuel pump defective	10. Replace fuel pump
Problem: Exhaust smoke dirty or heavy	
Condition	Remedy
1. Oil (in the engine) overfilled - contaminated	1. Drain excess oil - replace oil
2. Piston rings - cylinder worn	2. Replace - service rings - cylinder
3. Valve guides worn	3. Replace cylinder head
4. Cylinder wall scored - scuffed	4. Replace - service cylinder
5. Valve stems worn	5. Replace valves
6. Stem seals defective	6. Replace seals
Problem: Engine lacks power	
Condition	Remedy

1. Valve clearance incorrect	1. Adjust clearance
2. Valve springs weak	2. Replace springs
3. Valve timing incorrect	3. Re-time valve gear
4. Piston ring(s) - cylinder worn	4. Replace - service rings - cylinder
5. Valve seating poor	5. Repair seat
6. Spark plug fouled	6. Clean - replace plug
7. Rocker arms - shafts worn	7. Replace arms - shafts
8. Spark plug gap incorrect	8. Adjust gap - replace plug
9. Fuel Injector obstructed	9 Clean Fuel Injector
10. Fuel Pump defective	10 Replace Fuel Pump
11. Air cleaner element obstructed	11. Clean element
12. Oil (in the engine) overfilled - contaminated	12. Drain excess oil - change oil
13. Intake manifold leaking air	13. Tighten - replace manifold
14. Cam chain worn	14. Replace cam chain
Problem: Engine overheats	
Condition	Remedy
1. Carbon deposit (piston crown) excessive	1. Clean piston
2. Oil low	2. Add oil
3. Octane low - gasoline poor	3. Drain - replace gasoline
4. Oil pump defective	4. Replace pump
5. Oil circuit obstructed	5. Clean circuit
6. Engine Coolant too low	6. Fill Engine Coolant to the upper limit
7. Intake manifold leaking air	7. Tighten - replace manifold
8. Fan malfunctioning	8. Check fan fuse - replace fan
9. Fan switch malfunctioning	9. Replace fan switch

Final Drive Troubleshooting

Problem: Engine power not transmitted to wheels	
Condition	Remedy
1. Rear axle shafts serration worn - broken	1. Replace shaft Condition Remedy
Problem: Engine power not transmitted to front wheels	
1. Secondary drive - driven gear teeth broke	1. Replace gear(s)
2. Propeller shaft serration worn - broken	2. Replace shaft
3. Coupling damaged	3. Replace coupling
4. Coupling joint serration worn - damaged	4. Replace joint
5. Front drive - driven bevel gears broken - damaged	5. Replace gear(s)
6. Front differential gears/pinions broken - damaged	6. Replace gears - pinions
7. Sliding dogs/shaft fork worn - damaged	7. Replace gear(s)
8. Front drive axle worn - damaged	8. Replace axle
9. Front drive axle serration worn - damaged	9. Replace axle

Electrical Troubleshooting

Problem: Spark absent or weak	
Condition	Remedy
1. Ignition coil defective	1. Replace ignition coil
2. Spark plug defective	2. Replace plug
3. Magneto defective	3. Replace magneto
4. ECU unit defective	4. Replace ECU unit
5. Pick-up coil defective	5. Replace pick-up coil
Problem: Spark plug fouled with carbon	
Condition	Remedy
1. Gasoline incorrect	1. Change to correct gasoline
2. Air cleaner element dirty	2. Clean element
3. Spark plug incorrect (too cold)	3. Replace plug

4. Valve seals cracked - missing	4. Replace seals
5. Oil rings worn - broken	5. Replace rings
Problem: Spark plug electrodes overheat or burn	
Condition	Remedy
1. Spark plug incorrect (too hot)	1. Replace plug
2. Engine overheats	2. Service cooling system
3. Spark plug loose	3. Tighten plug
Problem: Magneto does not charge	
Condition	Remedy
1. Lead wires/connections shorted - loose - open	1. Repair - replace - tighten lead wires
2. Magneto coils shorted - grounded - open	2. Replace magneto coils
3. Regulator/rectifier defective	3. Replace regulator/rectifier
Problem: Magneto charges, but charging rate is below the specification	
Condition	Remedy
1. Lead wires shorted - open - loose (at terminals)	1. Repair - tighten lead wires
2. Stator coils (magneto) grounded - open	2. Replace stator coils
3. Regulator/rectifier defective	3. Replace regulator/rectifier
4. Battery voltage low	4. Recharging battery
5. Cell plates (battery) defective	5. Replace battery

Problem: Magneto overcharges	
Condition	Remedy
1. Internal battery short circuited	1. Replace battery
2. Regulator/rectifier damaged - defective	2. Replace regulator/rectifier
3. Regulator/rectifier poorly grounded	3. Clean - tighten ground connection
Problem: Charging unstable	
Condition	Remedy
1. Lead wire intermittently shorting	1. Replace lead wire
2. Magneto internally shorted	2. Replace magneto
3. Regulator/rectifier defective	3. Replace regulator/rectifier
Problem: Starter button not effective	
Condition	Remedy

1. Battery charge low	1. Charge - replace battery
2. Switch contacts defective	2. Replace switch
3. Starter motor brushes not seating	3. Replace starter motor
4. Starter relay defective	4. Replace relay
5. Emergency stop - ignition switch off	5. Turn on switches
6. Wiring connections loose - disconnected	6. Connect - tighten - repair connections
Problem: Battery "sulfation" **(Acidic white powdery substance or spots on surfaces of cell plates)**	
Condition	Remedy
1. Charging rate too low - too high	1. Replace battery
2. Battery run-down - damaged	2. Replace battery
Problem: Battery discharges too rapidly	
Condition	Remedy
1. Charging system not charging	1. Check magneto - regulator/rectifier - circuit connections
2. Cell plates overcharged - damaged	2. Replace battery - correct charging system
3. Battery short-circuited	3. Replace battery
Problem: Battery polarity reversed	
Condition	Remedy
1. Battery incorrectly connected	1. Reverse connections - replace battery - repair damage

Brake Troubleshooting

Problem: Braking poor	
Condition	Remedy
1. Pad worn	1. Replace pads
2. Pedal free-play excessive	2. Replace pads
3. Brake fluid leaking	3. Repair - replace hydraulic system component(s)
4. Hydraulic system spongy	4. Bleed hydraulic system - correct or repair leaks
5. Master cylinder/brake cylinder seal worn	5. Replace master cylinder

Problem: Brake lever travel excessive	
Condition	Remedy
1. Hydraulic system entrapped air	1. Bleed hydraulic system
2. Brake fluid low	2. Add fluid to proper level
3. Brake fluid incorrect	3. Drain system - replace with correct fluid
4. Piston seal - cup worn	4. Replace master cylinder
Problem: Brake fluid leaking	
Condition	Remedy
1. Connection joints loose	1. Tighten joint
2. Hose cracked	2. Replace hose
3. Piston seal worn	3. Replace brake caliper

Suspension and Steering

Problem: Suspension too soft	
Condition	Remedy
1. Spring(s) weak	1. Replace spring(s)
2. Shock absorber damaged	2. Replace shock absorber
3. Shock absorber preload too low	3. Adjust shock absorber preload
Problem: Suspension too stiff	
Condition	Remedy
1. A-arm-related bushings worn	1. Replace bushing
2. Shock absorber preload too high	2. Adjust shock absorber preload
Problem: Suspension noisy	
Condition	Remedy
1. Cap screws (suspension system) loose	1. Tighten cap screws
2. A-arm-related bushings worn	2. Replace bushings
Problem: Rear wheel oscillation	
Condition	Remedy
1. Rear wheel hub bearings worn - loose	1. Replace bearings
2. Tires defective - incorrect	2. Replace tires

3. Wheel rim distorted	3. Replace rim
4. Wheel hub cap screws loose	4. Tighten cap screws
5. Auxiliary brake adjusted incorrectly	5. Adjust brake
6. Rear suspension arm-related bushing worn	6. Replace bushing
7. Rear shock absorber damaged	7. Replace shock absorber
8. Rear suspension arm nut loose	8. Tighten nut

Problem: Handling too heavy or stiff	
Condition	Remedy
1. Front wheel alignment incorrect	1. Adjust alignment
2. Lubrication inadequate	2. Lubricate appropriate components
3. Tire inflation pressure low	3. Adjust pressure
4. Tie rod ends seizing	4. Replace tie rod ends
5. Linkage connections seizing	5. Repair - replace connections
Problem: Steering oscillation	
Condition	Remedy
1. Tires inflated unequally	1. Adjust pressure
2. Wheel(s) wobbly	2. Replace wheel(s)
3. Wheel hub cap screw(s) loose - missing	3. Tighten - replace cap screws
4. Wheel hub bearing worn - damaged	4. Replace bearing
5. Tie rod ends worn - loose	5. Replace - tighten tie rod ends
6. Tires defective - incorrect	6. Replace tires
7. A-arm bushings damaged	7. Replace bushings
8. Bolts - nuts (frame) loose	8. Tighten bolts - nuts
Problem: Steering pulling to one side	
Condition	Remedy
1. Tires inflated unequally	1. Adjust pressure
2. Front wheel alignment incorrect	2. Adjust alignment
3. Wheel hub bearings worn - broken	3. Replace bearings
4. Frame distorted	4. Repair - replace frame
5. Shock absorber defective	5. Replace shock absorber
Problem: Tire wear rapid or uneven	
Condition	Remedy

1. Wheel hub bearings worn - loose	1. Replace bearings
2. Front wheel alignment incorrect	2. Adjust alignment
3. Tire inflation pressure incorrect	3. Adjust pressure
Problem: Steering noise	
Condition	Remedy
1. Cap screws - nuts loose	1. Tighten cap screws - nuts
2. Wheel hub bearings broken - damaged	2. Replace bearings
3. Lubrication inadequate	3. Lubricate appropriate components

Diagnostic Trouble Codes (DTCs)

To evaluate the DTCs see the Check Engine Lamp (CELP) and Diagnostic Tool topics.

Blinks	Failure Codes	Fault description	Priority	Fault management
1	P0217	Engine temperature overheat	1	1.Stop immediately and check CELP code. 2. Check if the engine temperature sensor or electric circuit is faulty. 3. Check engine lubrication and cooling systems. 4. Check engine ignition and fuel systems.
2	P0335	Crankshaft position sensor or circuit malfunction	2	1. Check if the crankshaft position sensor, its connector, or wiring is faulty. 2. Make sure the generator rotor is aligned with the crankshaft position sensor.
3	P1120	Throttle position sensor setting value problem	2	1.Check if the TPS connector or wiring is faulty. 2.Check if the TPS is adjusted.
4	P1121	Throttle position sensor output range problem	2	1. Make sure the TPS connector is connected correctly. 2. Inspect the TPS

Blinks	Failure Codes	Fault description	Priority	Fault management
5	P1122	Throttle position sensor movement speed problem	2	1. Make sure the TPS connector is connected correctly.

				2. Inspect the TPS adjustment.
6	P0560	Battery voltage malfunction	1	1. Check the battery voltage. 2. Inspect the charging system.
7	P0110	Intake air temperature circuit malfunction	2	Inspect the T-MAP sensor
8	P0410	Idle air valve circuit malfunction	2	1. Check if the ISC connector or wiring is faulty. 2. Check the resistance of the idle air valve.
9	P0505	Idle speed volume control range problem	3	1.Check the ISC steps range with the diagnostic tool. 2. Check throttle body for carbon deposits. 3. Check intake for air leaks
10	P0251	Injector or electric circuit problem	2	1. Make sure the fuel injector connector is connected correctly. 2. Check if the ECU sends a signal to the injector. 3. Check the power source and resistance of the injector. 4. Make sure the battery is fully charged and connected correctly.

Blinks	Failure Codes	Fault description	Priority	Fault management
11	P0350	Ignition coil or electric circuit malfunction	2	1. Make sure the ignition coil connector is connected correctly. 2. Check if the ECU sends a signal to the ignition coil. 3. Check the ignition coil power source and resistance. 4. Make sure the battery is fully charged and connected correctly.
12	P0230	Fuel pump relay or electric	2	1. Make sure the relay and pump

		circuit malfunction		connectors are connected correctly. 2. Check if the ECU sends a signal to relay. 3. Check the fuel pump relay resistance
13	P0219	Engine speed has exceeded top speed	2	Check if the CVT belt is broken.
14	P1560	Sensor doesn't receive power source from ECU	2	1. ECU output to each sensor should be 5 DCV. 2. Check if the power source for all sensors is 5 DCV. 3. Check for a problem in the wiring harness. 4. If the CELP still blinks replace the ECU with a new item even if the output power source of ECU is normal.
15	P0700	Engine starting speed exceed CVT speed limited	2	Not used.
16	P0115	Engine temperature sensor or electric circuit malfunction	2	1. Make sure the WTS connector is connected correctly. 2. Check if the ECU pin is broken. 3. Check if the resistance of the sensor is out of specification.
17	P1561	Temperature gauge electric circuit malfunction	2	Not used.

Blinks	Failure Codes	Fault description	Priority	Fault management
18	P0650	CELP electric circuit malfunction	3	1. Check if the CELP bulb is faulty. 2. Check the CELP wires for damage.
21	P0105	Atmospheric Pressure Sensor/Circuit Malfunction	2	1. Make sure the MAP sensor connector is connected correctly.

				2. Check ECU for broken pins. 3. Check the sensor voltage. 4. Use Diagnostic Tool to check the pressure.
22	P0110	Roll sensor or electric circuit malfunction	2	1. Make sure the sensor is installed in the correct position. 2. Check the sensor voltage. 3. Check ECU for broken pins.

2.Periodic Maintenance

This chapter covers the location and servicing of the periodic maintenance items for the KYMCO MXU 700i and MXU 500i models.

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

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2.Air Filter Servicing 2-6
3.Brake Fluid 2-19
4.Brake Inspection 2-26
5.Compression Check 2-31
6.Engine Idle Speed 2-34
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8.Final Drive / Differential Oil 2-46
9.Spark Arrestor 2-58
10.Spark Plug 2-63
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14.Valve Clearance 2-88

WARNING

Before running the engine, make sure that the working area is well-ventilated. Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas which may cause death to people.

- Gasoline is extremely flammable and is explosive under some conditions. The working area must be well-ventilated and do not smoke or allow flames or sparks near the working area or fuel storage area.

Periodic Maintenance Chart

Periodic maintenance is required to keep the vehicle safe and performing properly. For use exceeding the chart repeat the service intervals.

ITEM			INITIAL	EVERY	
	WHICHEVER COMES FIRST	mi	100	600	1200
		Km	150	1000	2000
	ROUTINE	MONTH	1	6	12
Engine oil	•Replace (Warm engine before draining).		o	o	o
Oil strainer	•Clean. •Replace if necessary.		o	o	o
Engine oil filter cartridge	•Replace		o	o	o
Front drive gear oil	•Check oil level/oil leakage •Replace every 12 months.		o		o
Rear drive gear oil	•Check oil level/oil leakage •Replace every 12 months,		o		o
Air filter element (for engine)	•Clean. (More often in wet or dusty areas.) •Replace if necessary.			o	o
Air filter element (for V-belt compartment)	•Clean. (More often in wet or dusty areas.) •Replace if necessary.			o	o
Throttle Body	•Check idle speed/starter operation. •Adjust if necessary.		o	o	o
Cylinder head cover breather system	•Check breather hose for cracks or damage. •Replace if necessary.			o	o
Spark plug	•Check condition,		o	o	o

	•Adjust gap and clean. •Replace if necessary.				
Fuel line	•Check fuel hose for cracks or damage. •Replace if necessary.			o	o
Valves	•Check valve clearance, •Adjust if necessary.		o	o	o
Brake	•Check operation and brake fluid. •Replace brake pad if necessary.		o	o	o
Coolant	•Check coolant leakage. •Replace if necessary. •Replace coolant every 24 months.		o	o	o
V-belt	•Check operation. •Replace if damage or excessive wear.		o		o
Exhaust system	•Check leakage. •Retighten if necessary. •Replace gasket if necessary.			o	o
Spark arrester	•Clean			o	o
Wheels	•Check balance/damage/runout. •Replace if necessary.		o	o	o
Wheel bearings	•Check bearing assembly for looseness/damage. •Replace if damaged.		o	o	o
Steering system	•Check operation. •Replace if damaged. •Check toe-in. •Adjust if necessary.		o	o	o
Drive shaft boots	•Check operation. •Replace if damaged.			o	o
Suspension (front)	•Check operation. •Correct if necessary.			o	o
Suspension (rear)	•Check operation. •Correct if necessary.			o	o
Knuckle shafts/	•Lubricate every 6 months.			o	o

Steering shaft					
Fittings and Fasteners	•Check all chassis fittings and fasteners. •Correct if necessary.		o	o	o

*Dusty or wet conditions require shorter maintenance intervals.

Air Filter Servicing

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Cover

Remove the seat. See the Seat topic for more information.

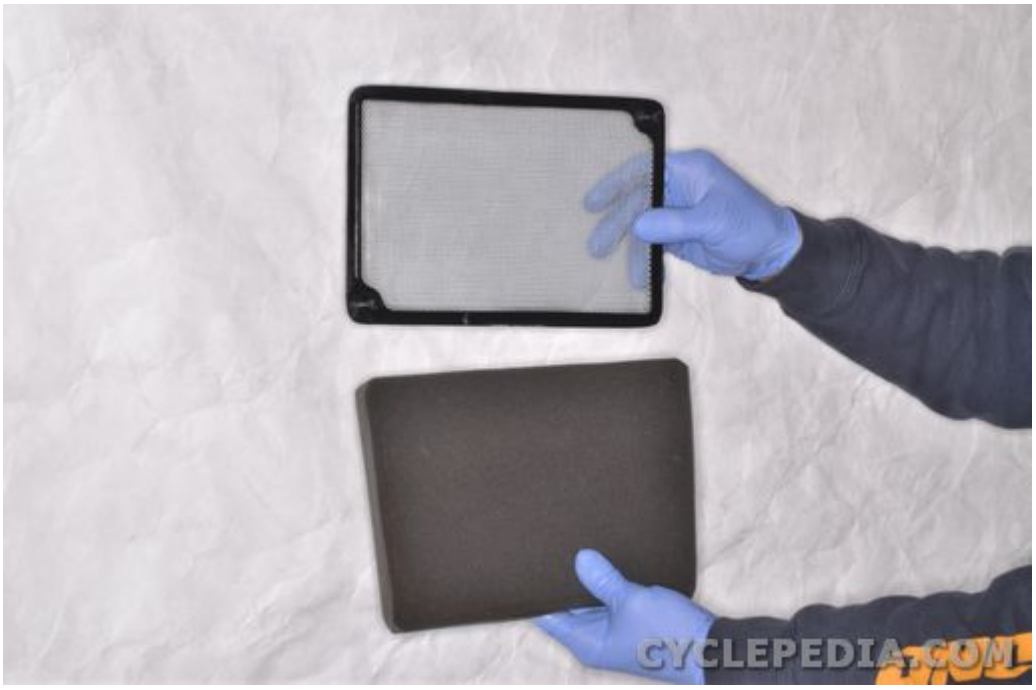
The air filter housing cover is held in place by six latches.

Unlock the air filter cover latches.

Remove the air filter housing cover. Inspect the air filter housing cover rubber seal and replace it as needed.

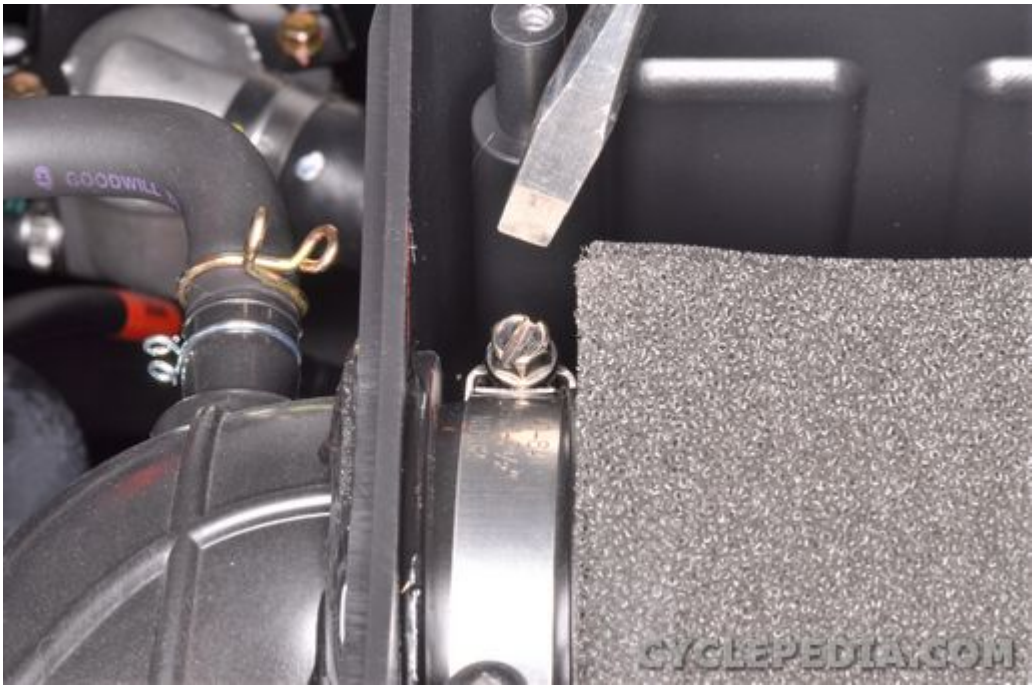
700

Lift out the air filter element and element holder.

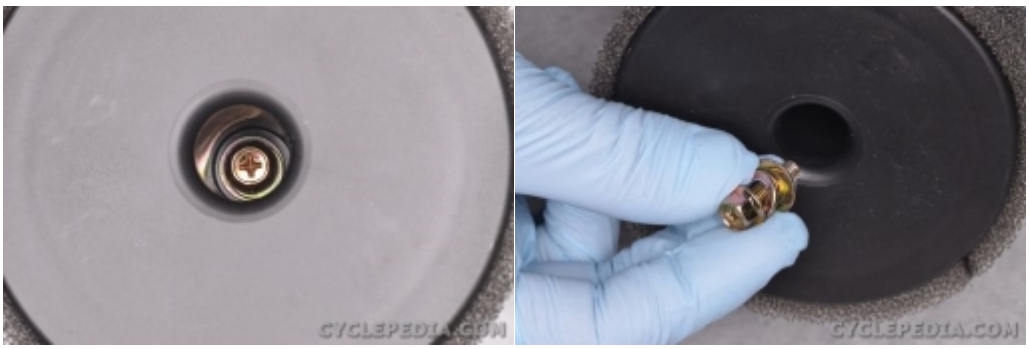


Separate the air filter element from the holder.

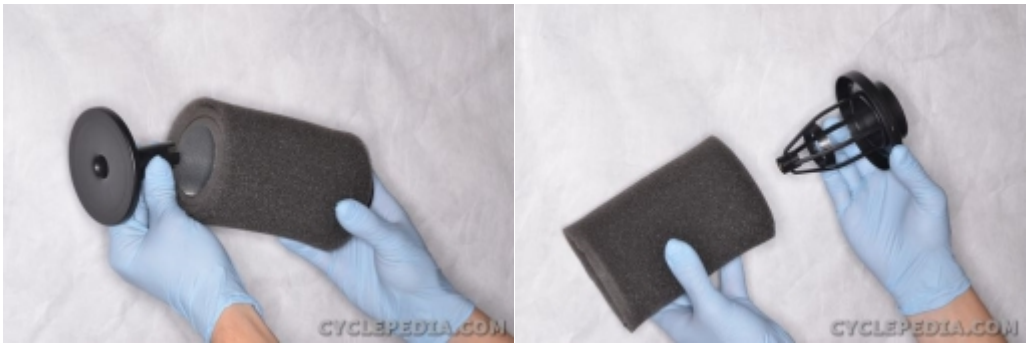
500



Loosen the air filter clamp screw with a flat blade screwdriver or an 8 mm socket. Lift out the air filter. Clean out the airbox.



Loosen the air filter holder screw with a #2 Phillips screwdriver. Remove the screw and washers from the air filter.



Remove the air filter holders from the air filter.

Slide out the air filter screen.

Separate the inner and outer air filter element pieces.

Servicing

Place the filter in a container and saturate it with a foam air filter cleaner both inside and out. Products like Simple Green, dish soap, or most non-flammable solvents will work if foam air filter cleaner is unavailable.

Let the filter soak for approximately 5 minutes - follow cleaning product instructions if different. Rinse the element in warm water until the water runs clear. You may squeeze the filter to remove excess cleaner but never twist it.

Let the air filter dry completely.

Once the element is completely dry, blow it off with low pressure compressed air or pat it down with a clean shop towel to remove any remaining debris.

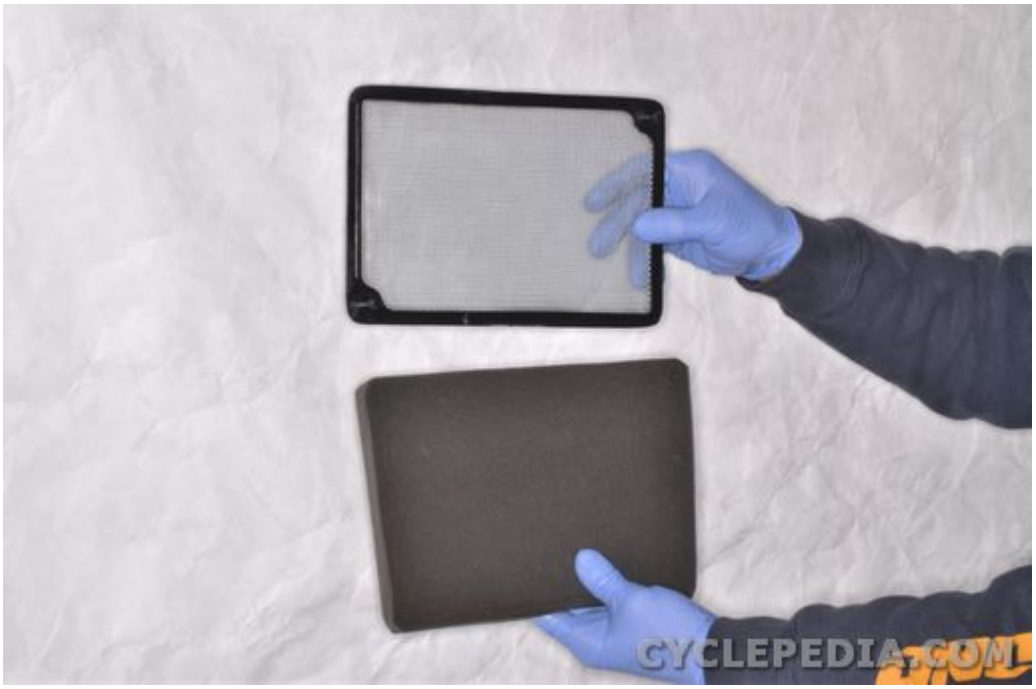
NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

Oil the filter with foam air filter oil or fresh engine oil. Squeeze out any excess oil. The element should be wet with oil, but not to the point of dripping.

Clean the out the airbox.

Installation

700



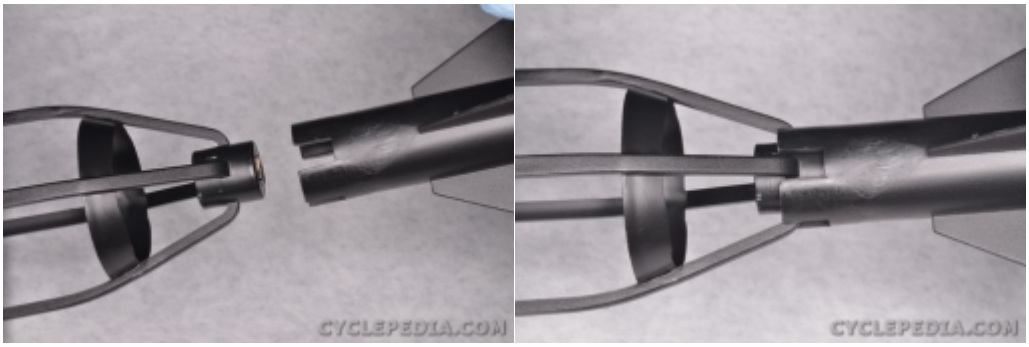
Install the air filter element onto the holder.

Fit the air filter element and holder into place. The element holder should be on the bottom.

500

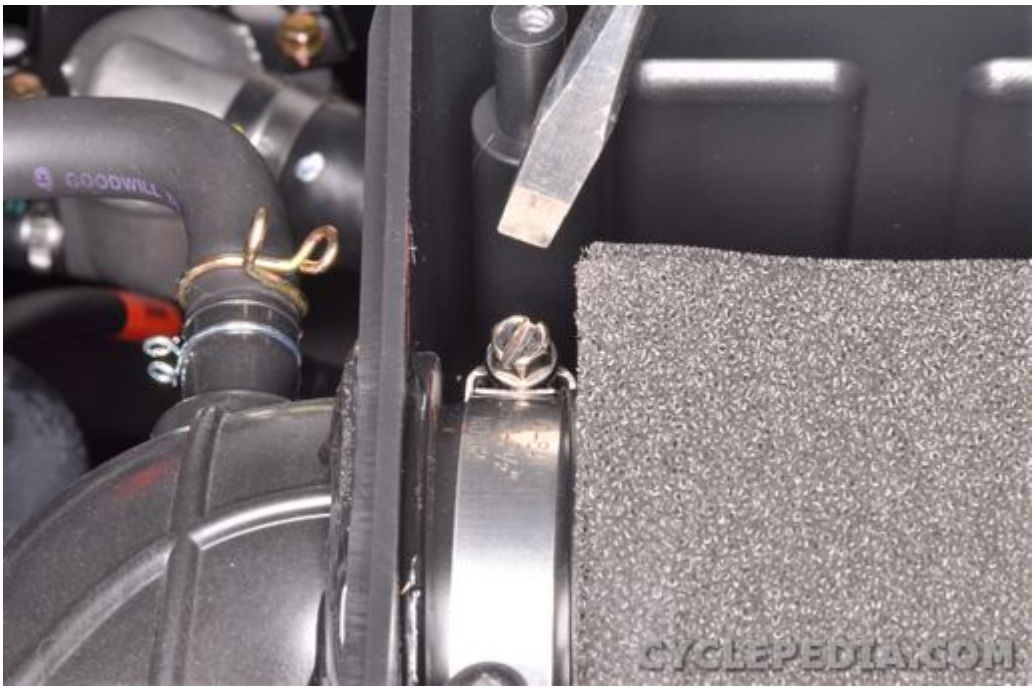
Fit the inner air filter element into the outer element.

Insert the screen into the air filter elements.



Install the air filter holders into the air filter. The holders must fit together as shown.

Install the air filter holder screw and washers. Tighten the air filter holder screw securely with a #2 Phillips screwdriver.



Fit the air filter into place. Tighten the air filter clamp screw securely with a flat blade screwdriver or an 8 mm socket.

Cover

Fit the airbox cover into place. Make sure the rubber seal is installed and in good condition.

Secure the air filter cover latches.

Airbox Drain

Inspect the airbox drain tube.

Remove the tube and drain away any fluid build up or debris that has collected.

Return the tube and secure it with the clamp.

Brake Fluid

The KYMCO MXU 700i models uses DOT 4 brake fluid. Do not mix the brake fluid types. The system should be bled whenever the brakes feel spongy, or if the brake system has been taken apart and rebuilt. Always use fresh brake fluid from a tightly sealed container.

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Brake fluid is very caustic and can damage paint, chrome and plastic. Wipe up any spills immediately.

Inspection

Place the vehicle on level ground so the master cylinder reservoirs are level.

Check the level of brake fluid. The level should be above the "L" line.

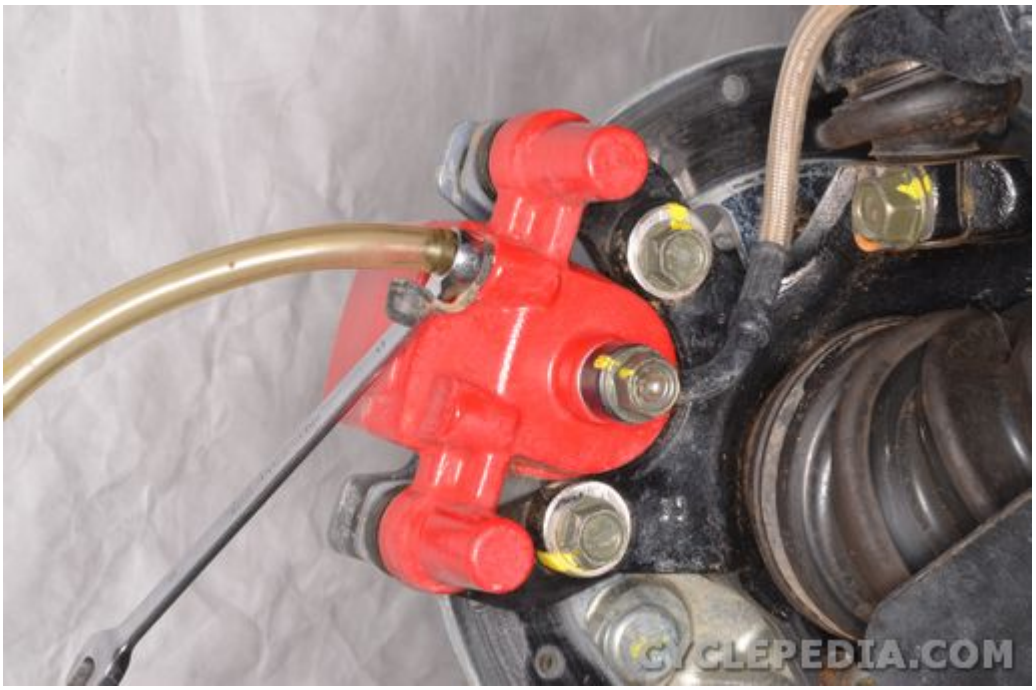
Compress the brake lever or pedal several times. The lever or pedal should be firm. If the lever or pedal is not firm, but mushy, the brake system requires bleeding.

There are two rear brake calipers. The caliper that mounts to the top of the final drive gear is connected to the pedal activated master cylinder. The caliper that mounts to the side of the final drive gear is connected to the left handlebar master cylinder. The right handlebar master cylinder connects to the front brake calipers.

Bleeder Valves

There is a bleeder valve on each brake caliper.

The bleeder valves are usually very tight so use a box end wrench or a 6 point socket and ratchet to prevent rounding off the head. Snug the bleeder valve back down after breaking it loose the first time.



Place the box end wrench on the valve and attach a clear hose to the bleeder valve for draining or bleeding. Route the hose to suitable container.

Draining

To remove the brake fluid remove the reservoir cap, open the bleeder valve and suck out he old brake fluid with a mighty-vac or similar devise.

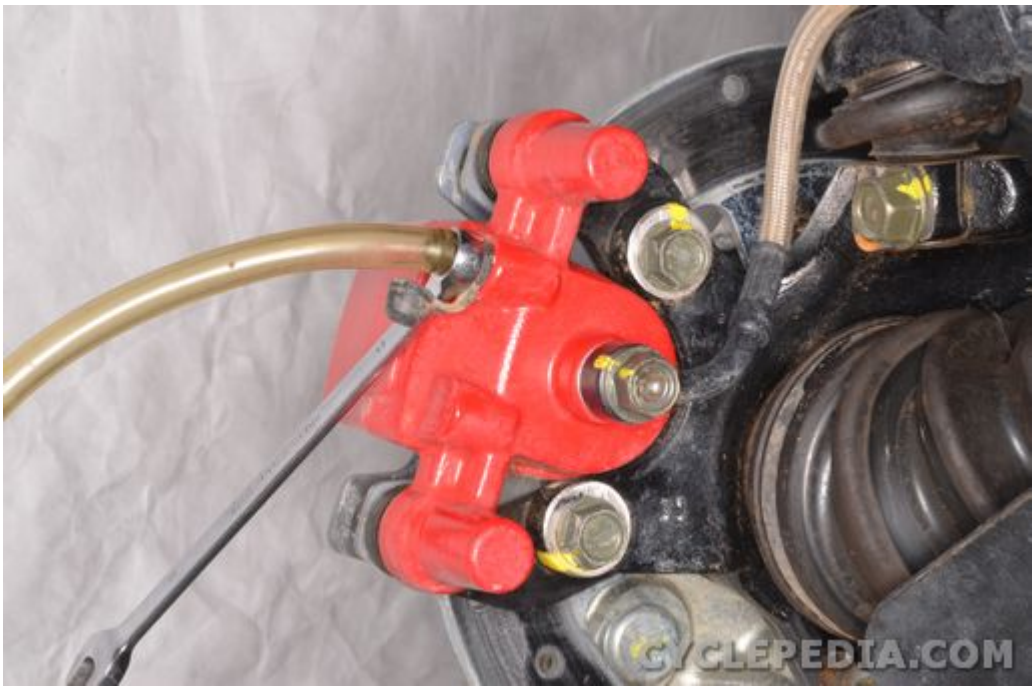
Bleeding

There are three separate brake systems, one with each master cylinder.

Master Cylinder	Caliper/s
Right Handlebar	Front
Left Handlebar	Rear - side of the final drive gear
Pedal	Rear - top of the final drive gear

A. Remove the cover and fill the reservoir with DOT 4 brake fluid from a fresh, newly opened container and bleed the brakes.

B. Install the cover to keep debris out of the fluid: then slowly compress the brake lever (or pedal) several times.



C. Remove the protective cap. Install one end of a clear hose onto the bleeder screw of the brake system being serviced, and direct the other end into a container: then while holding pressure on the brake lever, open the bleeder screw and watch for air bubbles. Close the bleeder screw before releasing the brake lever. Repeat this procedure until no air bubbles are present.

Be certain to check the master cylinder reservoir/s occasionally to make sure the reservoir doesn't run dry. Add more brake fluid as necessary. Continue this process until clean brake fluid comes out of the bleeder valve and there are no air bubbles. The brake lever/pedal should feel firm.

D. Repeat step C until the brake lever is firm.

E. Fill the master cylinder with brake fluid above the "L" line and install the cap.

Carefully check the entire hydraulic brake system that all hose connections are tight, the bleed screws are tight, the protective caps are installed, and no leakage is present.

Check the function of the brakes before operating the machine.

Brake Inspection

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Master Cylinder

Place the vehicle on level ground so the master cylinder reservoirs are level.

Check the level of brake fluid. The brake fluid level should be above the "L" line.

Remove the rear fender to view the rear brake master cylinder reservoir. See the Rear Fender topic for more information.

Inspect the brake fluid level in the reservoir. The level should be above the lower line.

Note: The more the brake pads are worn the more fluid will be required from the reservoir to fill out the system. If the brake fluid is filled with worn pads, and new pads are installed the brake fluid level in the reservoir will rise.

Compress the brake lever or pedal several times. The lever or pedal should be firm. If the lever or pedal is not firm, but mushy, the brake system requires bleeding.

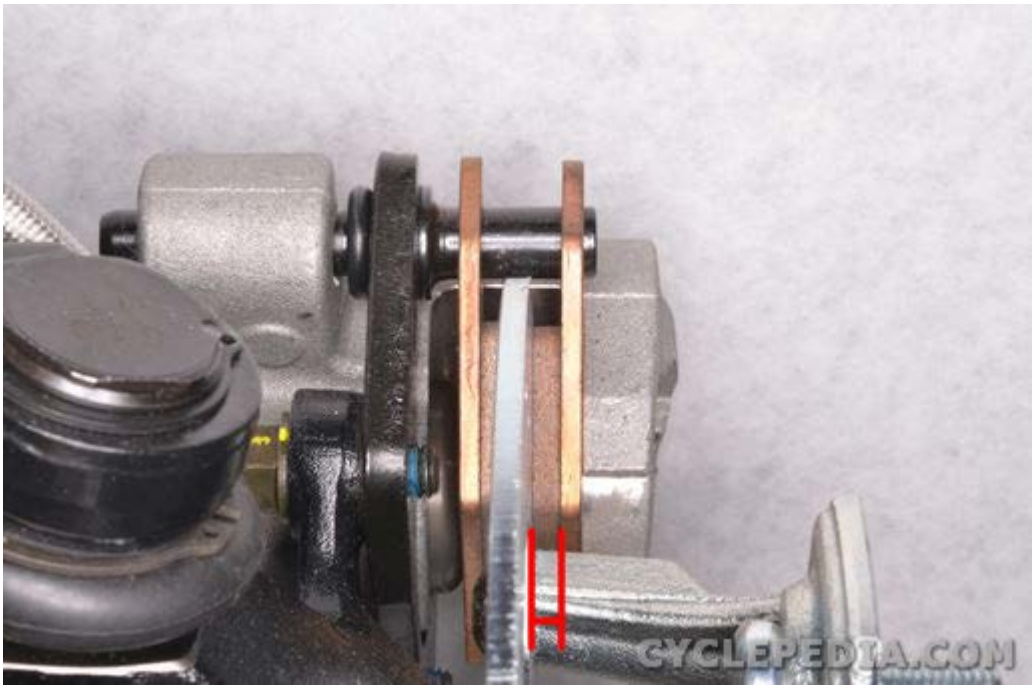
For more information on the brake fluid see the Brake Fluid topic.

Brake Pads

Use a jack to raise the front wheels off the ground. Be sure it is on a level surface.

Remove the front wheels or left rear wheel as needed. See the Wheels and Wheel Hubs topic for more information.

Inspect the pad linings and rotors.



Replace the pads if the lining has worn below 1 mm or 0.039 in.

- Front Brake Calipers
- Rear Brake Calipers

Brake Discs

Inspect the brake disc for damage. See the Brake Discs topic for more information.

Rear Brake Pedal Height

Remove the right mudguard. See the Mudguards and Footrests topic for more information.

To adjust the rear brake pedal height loosen the locknut and turn the adjuster bolt. Tighten the locknut securely when finished. Inspect the rear brake light switch.

Rear Brake Light Switch

The rear brake light switch should trigger the brake light just before the rear brake engages. Hold the switch body still and turn the nut to adjust the rear brake light switch if needed.

Compression Check

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Run the engine to warm it up before conducting a compression test. Make sure your compression gauge is in good working order and does not leak. The battery must be fully charged when testing the compression.

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Spark plug	Spark Plug

Ground the spark plug to the engine well away from the spark plug hole.

Install the compression tester into the sparkplug hole using a compression gauge adapter and tighten it hand tight.

Hold the throttle wide open and use the electric starter to turn the engine over. Crank the engine until the needle on your compression gauge stops rising. This should occur in 4 to 7 seconds of engine cranking. Do not crank the engine for more than 7 seconds. Compare your reading with the specification.

Item	Standard mm (in)
Cylinder head compression pressure	15 kg/cm^2(1500 kPa, 213 psi)

Low compression is an indication of excessive engine wear, possibly worn rings or poorly sealing valves, or improper valve clearance.

Low Compression Troubleshooting	
1.	Verify the starter cranks the engine over and normal speed ~ 400 rpm
2.	Make sure the compression gauge is working correctly
3.	Make sure the throttle is fully open for testing
4.	Check the valve clearance - Valve Adjustment
5.	Inspect the valves or valve seats - Valves
6.	Pour 29.5 ml (1 fl oz) of fresh engine oil into the spark plug hole and retest the

	compression. If the compression is now in the correct range the piston and rings should be inspected. - Cylinder and Piston

High compression is possibly an indication of excessive carbon buildup on the piston or performance modifications.

Engine Idle Speed

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Start the engine and let it warm up. The engine must reach 80° C to correctly inspect the idle speed.

Connect the diagnostic tool and use the DATA analyze feature to inspect the idle speed. See the Diagnostic Tool topic for more information.

Idle speed (rpm)	MXU 500i	1400 ± 100 rpm
	MXU 700i	1500 ± 100 rpm

Engine Oil

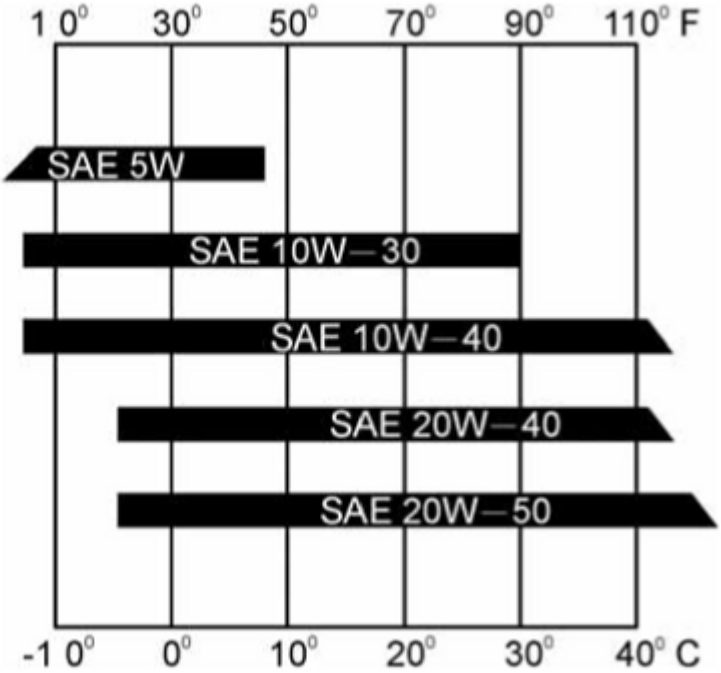
Type and Capacity

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Oil total capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)

Caution: Any oil used in place of the recommended oil could cause serious engine damage. Do not use oils which contain graphite or molybdenum additives. These oils can adversely affect clutch operation. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils.

ITEM	STANDARD	SERVICE LIMIT
Recommended engine oil	KYMCO 4-stroke oil or equivalent motor oil API service classification SJ Viscosity: SAE 5W-50	—



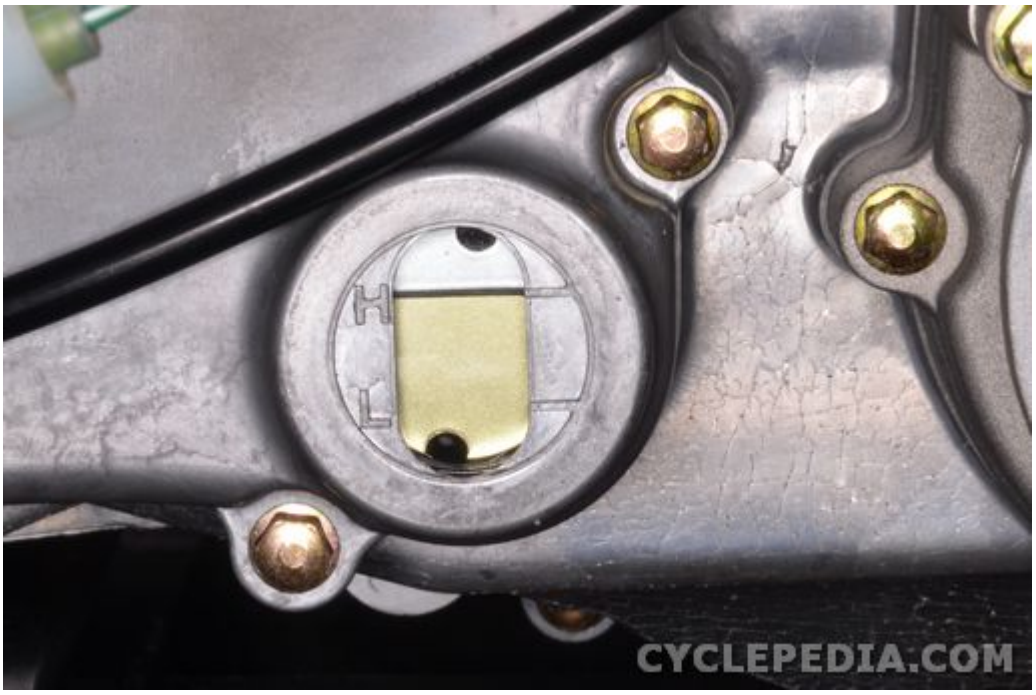
Other engine oil viscosities shown in the chart may be used when the average temperature in the riding area is within the indicated range.

Inspection

Start the engine and let it warm up for 2 - 3 minutes. Park the vehicle on a level surface. Stop the engine and allow the oil to settle for at least a minute.

The oil sight glass is located on the right side of the vehicle.

Peak behind the footrest mudguard to see the oil sight glass and oil filler cap.



Inspect the oil level through the sight glass. The sight glass is located on the left side of the engine. The oil level should be between the "H" and "L" marks as shown.

If the oil level is at or below the "L" mark add more of the same type and brand of oil to the engine through the oil filler hole. Wipe down the area around the filler cap to prevent debris from entering the engine. Inspect the filler cap O-ring and replace it as needed.

If the oil level is above the upper mark drain some of oil from the drain plug.

Servicing

To replace the oil filter cartridge remove the right side cover. See the Side Covers topic for more information.

Start and run the engine for a minute or two, this will heat the engine and allow the oil to drain out faster and more completely.

NOTE: Hot engine oil can burn you, take precautions not to touch the oil when draining.

Place a drain pan under the oil filter cap and drain plug.

Loosen the oil filter cap with a 19 mm socket.

Remove the drain plug, oil filter cap, strainer, spring and O-ring. Allow the oil to drain into the pan. Clean and inspect the strainer. Inspect the O-ring. Replace any parts if needed.

Note: You can remove the drain plug to drain the engine oil also, but you will not be able to clean the strainer. This is a good way to drain engine oil if it was over-filled. Replace the sealing washer with a new item if it was removed.

Remove the oil cap for faster draining.

Use an oil filter wrench and loosen the oil filter cartridge.

Special Tool - Oil Filter Wrench: A120E00052

Remove the oil filter cartridge.

Apply engine oil to the O-ring. When the oil has finished draining install the oil filter cap, strainer, spring and O-ring. Torque the oil filter cap to specification with a 17 mm socket.

Item	Q'ty	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)	Remarks

Engine oil filter cap	1	30	1.5 (15, 11)	Apply oil
Engine drain plug	1	12	2.5 (25, 18)	

Apply fresh engine oil to the rubber oil filter cartridge seal.

Install the oil filter cartridge onto the engine and tighten by hand until the oil filter contacts the engine.

Tighten the oil filter cartridge to specification with the oil filter wrench.

Item	Q'ty	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)	Remarks
Engine oil filter cartridge	1	20	1 (10, 7.2)	Apply oil

Refilling

Oil total capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)

Caution: Any oil used in place of the recommended oil could cause serious engine damage. Do not use oils which contain graphite or molybdenum additives. These oils can adversely affect clutch operation. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils.

Add the proper type and quantity of oil and install the oil filler cap. Start the engine and let it run for several minutes. Check for any oil leaks. Check the oil level as describe above. If the oil level is too high drain the excess oil from the oil drain bolt.

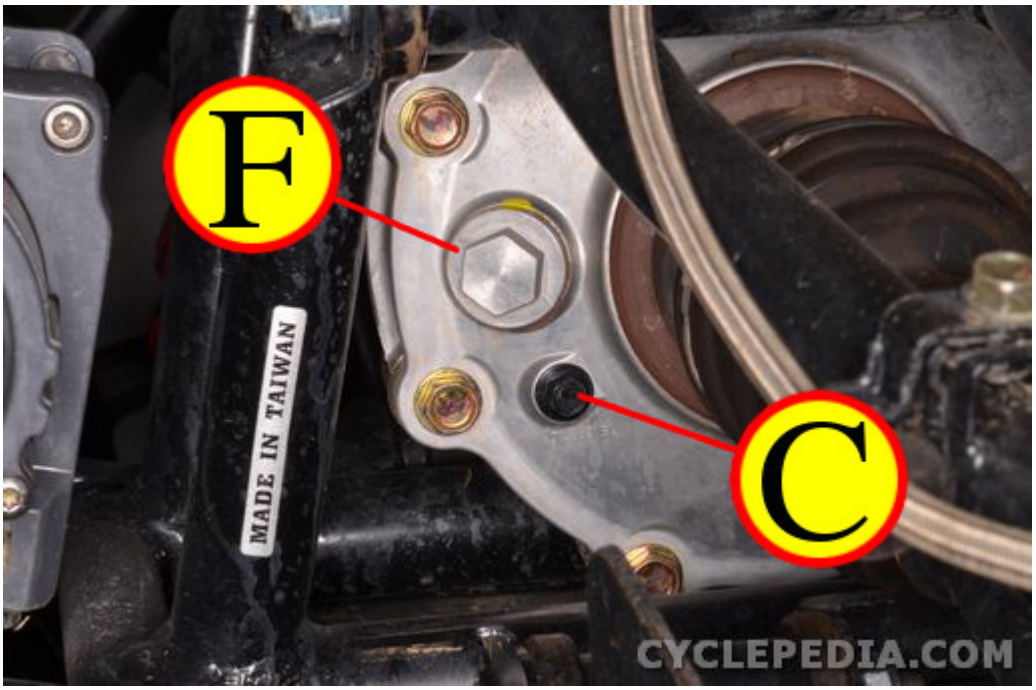
Final Drive Oil

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Front gear box oil	
Recommended oil:	SAE 80
At disassembly:	270 cc
At change:	250 cc
Rear gear box oil	
Recommended oil:	SAE 80
At disassembly:	250 cc
At change:	230 cc

Front Final Drive Gear Oil

Inspection



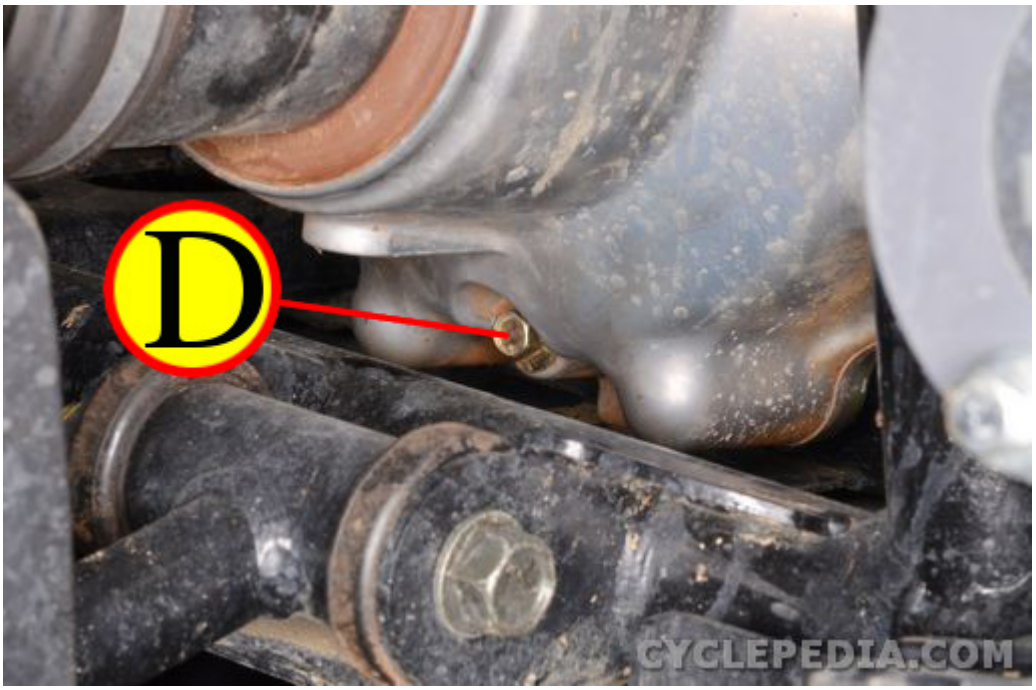
The filler cap (F) and check bolt (C) are all located on the left side of the front final drive gear case.

Remove the oil level check bolt with an 8 mm socket. If oil doesn't flow from the check hole add oil until it reaches the level of the check hole. Return the check bolt to the hole and tighten it securely with an 8 mm socket.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Front drive gear oil level check bolt	1	6	1 (10, 7.2)

Draining

Remove the filler cap with a 17 mm socket. Inspect the filler cap O-ring and replace it as needed.



The drain bolt (D) is located on the right side of the front final drive gear case.

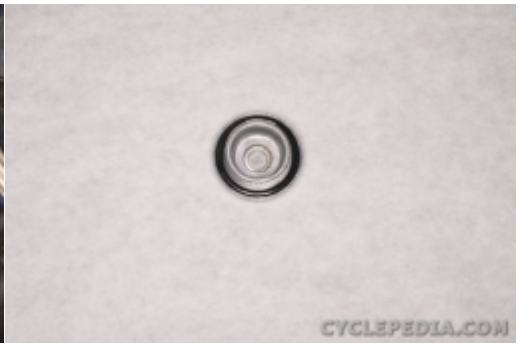
Place a suitable oil drain pan under the drain bolt. Remove the drain bolt with an 8 mm socket. Allow the gear oil to drain into the drain pan. Install the drain plug and tighten it to specification with an 8 mm socket.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)

Front drive gear oil drain bolt	1	14	3.2 (32, 23)

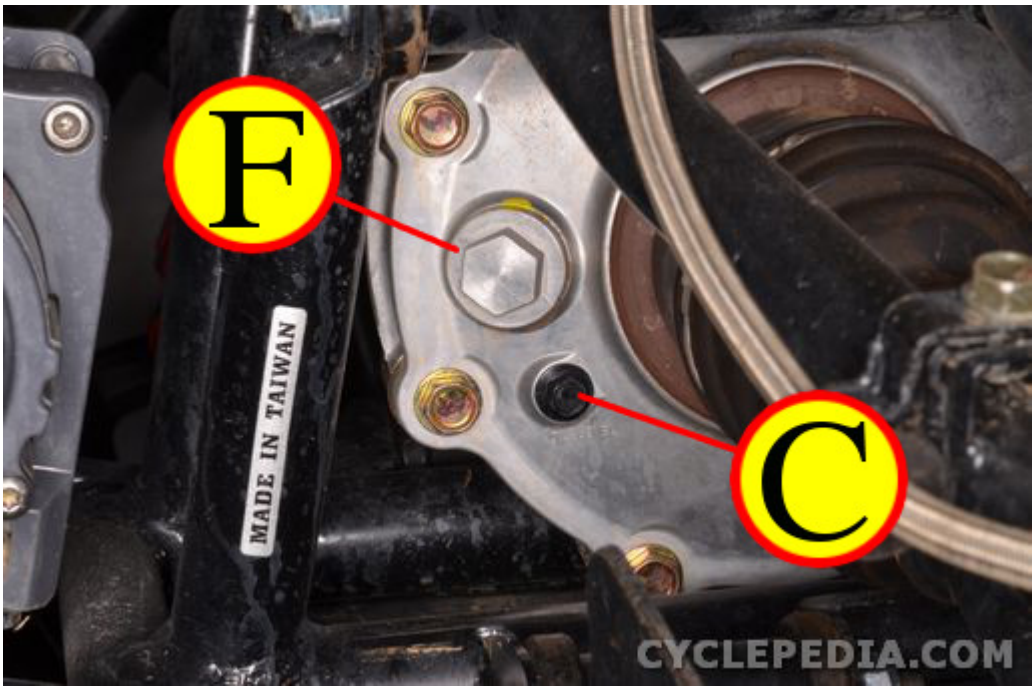
Filling

Front gear box oil	
Recommended oil:	SAE 80
At disassembly:	270 cc
At change:	250 cc



Remove the filler cap with a 17 mm socket. Inspect the filler cap O-ring and replace it as needed.

Remove the check level bolt. Fill the gear oil until the oil level reaches the check bolt hole.

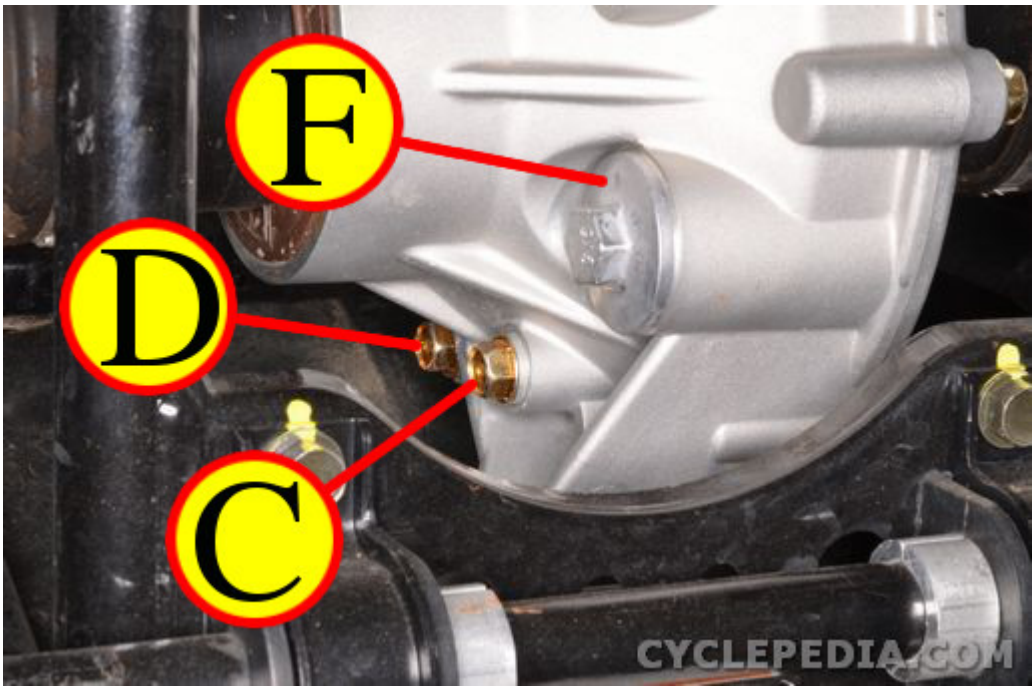


Install the check bolt and filler cap and tighten them to specification.

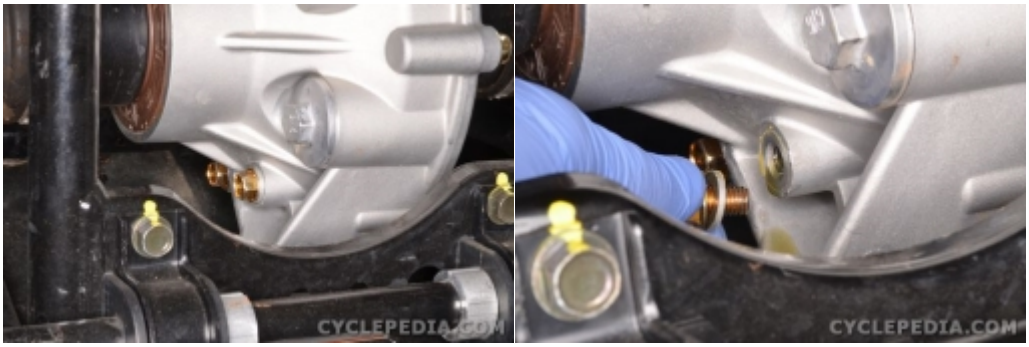
Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Front drive gear oil filler cap	1	18	3.5 (35 25.5)
Front drive gear oil level check bolt	1	6	1 (10, 7.2)

Rear Final Drive Gear Oil

Inspection



The filler cap (F), check bolt (C), and drain bolt (D) are all located on the left side of the rear final drive gear case.



Remove the oil level check bolt with a 12 mm socket. If oil doesn't flow from the check hole add oil until it reaches the level of the check hole. Return the check bolt to the hole and tighten it securely with a 12 mm socket.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear drive gear oil level check bolt	1	8	2 (20, 15)

Draining

Remove the filler cap with a 17 mm socket.

Inspect the filler cap O-ring and replace it as needed.

Place a suitable oil drain pan under the drain bolt. Remove the drain bolt. Allow the gear oil to drain into the drain pan. Install the drain plug and tighten it to specification.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear drive gear oil drain bolt	1	8	2 (20, 15)

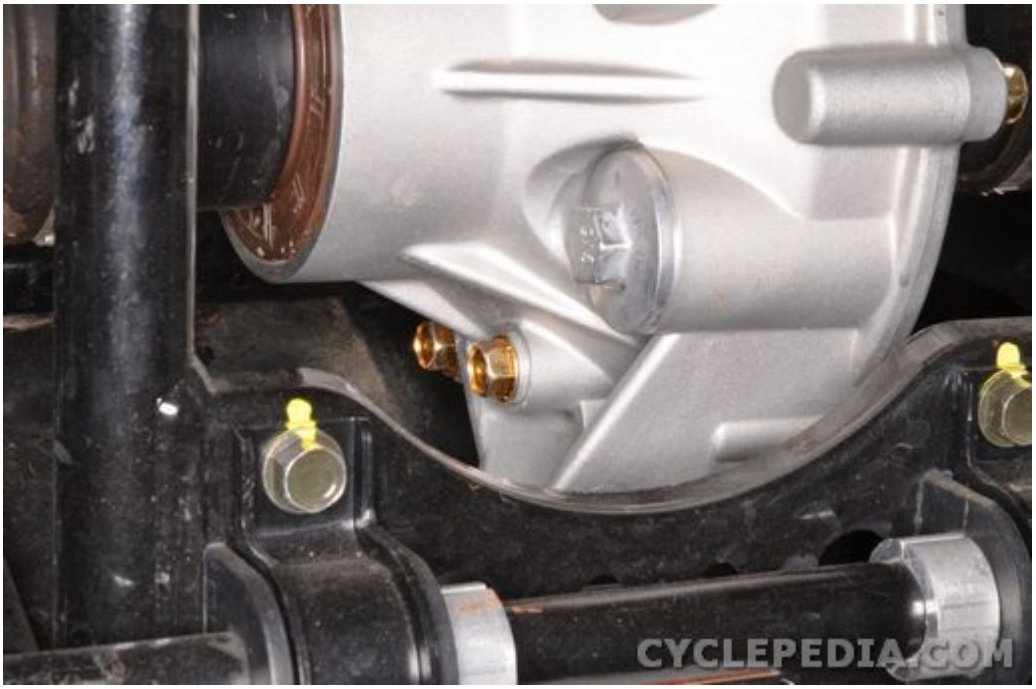
Filling

Remove the filler cap with a 17 mm socket.

Inspect the filler cap O-ring and replace it as needed.

Remove the check level bolt. Fill the gear oil until the oil level reaches the check bolt hole.

Recommended oil:	SAE 80
At disassembly:	250 cc
At change:	230 cc



Install the filler cap and tighten it securely with a 17 mm socket.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear drive gear oil filler cap	1	30	1.5 (15, 11)

Spark Arrestor

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Note: Always allow the exhaust system plenty of time to cool before touching it.

Remove the three spark arrestor bolts with an 8 mm socket.

Remove the spark arrestor and gasket.

Clean the carbon off of the spark arrestor screen with a wire brush.

Inspect the spark arrestor screen for any damage and replace as needed.

Installation

Install the spark arrestor with a new gasket.

Install the spark arrestor bolts and tighten them securely with an 8 mm socket.

Spark Plug

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Spark plug	NGK-CR7E
Spark plug gap	0.6 - 0.7 mm (0.024 - 0.028 in.)

Removal

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank

Pull the spark plug cap off of the spark plug.

Clean off the area surrounding with compressed air or a shop towel to make sure debris doesn't get into the combustion chamber when the spark plug is removed.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

Remove the spark plug using a 5/8 in deep well spark plug socket.

Inspection

Inspect the spark plug for signs of damage. Always replace a spark plug if any part of it is damaged.

The color of the spark plug's porcelain tip can indicate how the mixture is burning. A white colored plug shows a lean mixture, where a dark plug shows a rich mixture. A light brown color is optimal. For more information see the spark plug trouble shooting chart.

http://www.cyclepedia.com/spark-plug-troubleshooting/

If the plug is dirty or has carbon build up it can be cleaned with small wire brush. Do not hesitate to replace a spark plug.

Always check the gap of the spark plugs before installation. If the gap needs to be adjusted bend the ground electrode carefully.

Item	Standard
Spark plug gap	0.6 - 0.7 mm (0.024 - 0.028 in.)

Installation

Install the spark plug by hand.

Tighten it to specification a 5/8 in deep well spark plug socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		Nm	kgf-m	ft-lb
SPARK PLUG	M10 X 1.0	9.8-13.7	1.0-1.4	8.7

Do not over tighten the spark plug. The cylinder head is made out of soft metal, and it can be easily damaged.

Install the spark plug cap onto the spark plug.

Install these components	
Component	Topic
Fuel tank and shield	Fuel Tank
Seat	Seat

Throttle Free Play

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

Inspect the throttle free play by operating the throttle lever. The free play should be 3 - 5 mm (0.125 - 0.20 in) measured at the end of the throttle lever. The free play is the distance from the lever at rest to where resistance is felt.

When the throttle lever is pushed all the way in and released it should return to its resting position quickly. Also, the throttle operation should be smooth.

Adjustment

Slide back the rubber cover from the throttle cable.

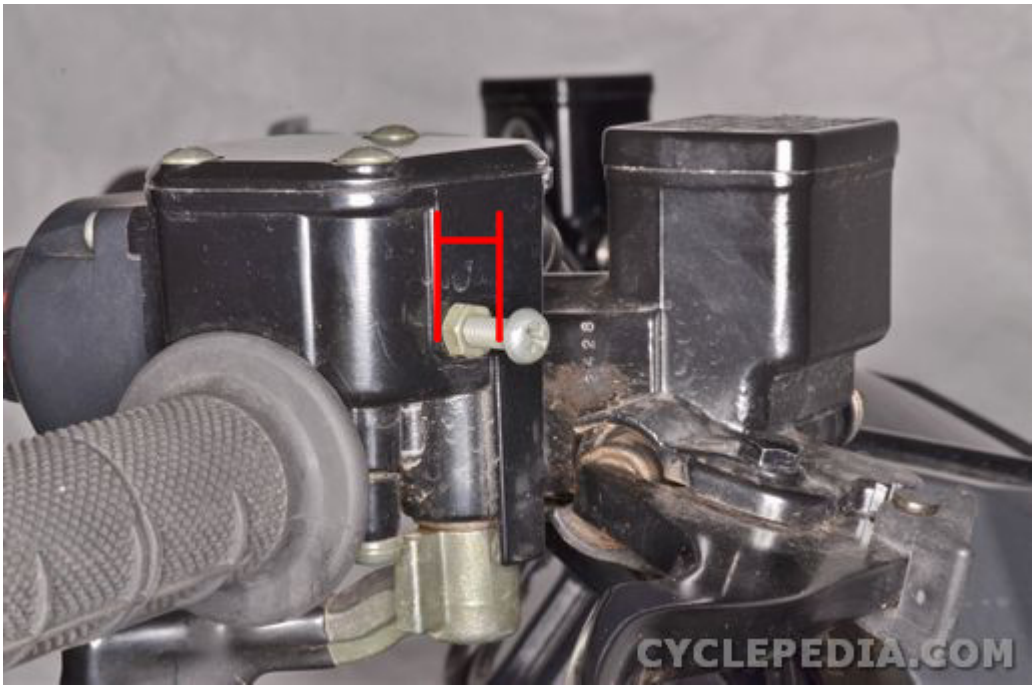
To adjust the throttle free play loosen the knurled lock nut on the throttle cable.

Turn the adjuster out to decrease free-play and turn it in to increase free-play.

Always check that the throttle operates freely and returns properly. Tighten the knurled lock nut securely.

Slide the rubber cover into place.

Throttle Limiter



The throttle limiter can be used to adjust how much the throttle can be open. Loosen the locknut and turn the screw to adjust the throttle. Do not adjust the screw so that it is more than 13 mm out from the housing. Tighten the locknut securely after the adjustment has been made. Make sure the throttle free play is in specification and the throttle movement is smooth.

Hazard: Improper adjustment of the speed limiter and throttle can create a hazard. The throttle operation could be damaged or the throttle movement could be affected.

Tires

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Tire Size

Tires (standard models)	Front wheel	AT 25 X 8-12
	Rear wheel	AT 25 X 10-12

Tires (LE models)	Front wheel	AT 26 X 9-14
	Rear wheel	AT 26 X 11-14

Air Pressure

Check the tire pressure with a low pressure gauge.

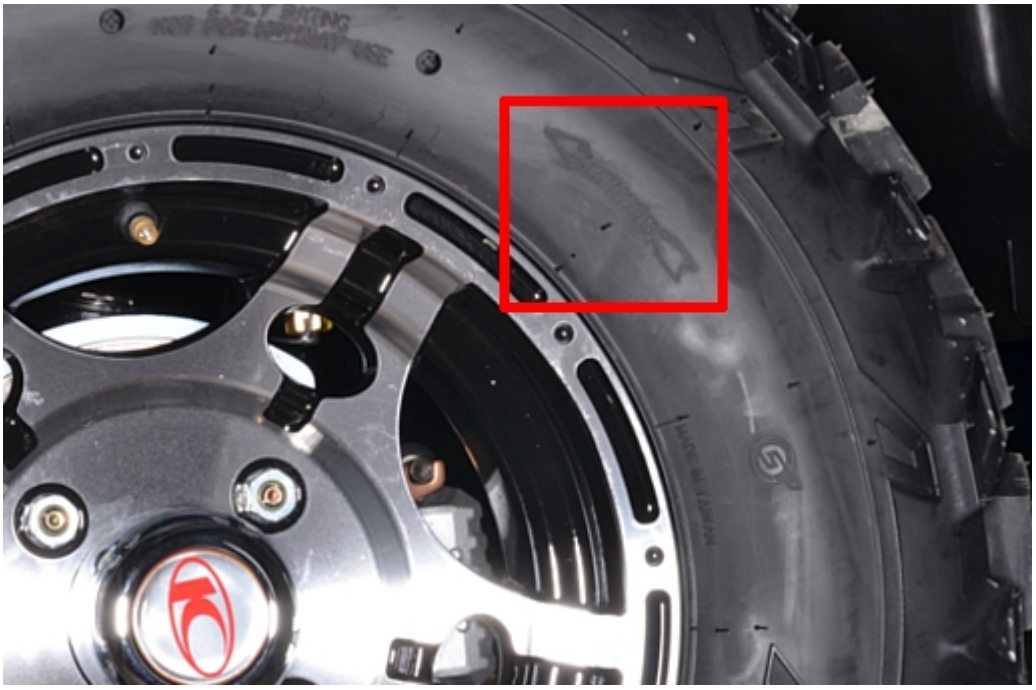
Tire pressure	Front (standard)	0.35 kgf/cm^2 (35 Kpa, 5.0 psi)
	Rear (standard)	0.32 kgf/cm^2 (32Kpa, 4.5 psi)
	Front (LE)	0.7 kgf/cm^2 (70 Kpa, 10 psi)
	Rear (LE)	0.97 kgf/cm^2 (97 Kpa, 14 psi)

Tire Tread Depth

Check that the tire tread depth is within specification.

Tire Tread Depth Service Limit	
Front Tire	4 mm (0.16 in)
Rear Tire	4 mm (0.16 in)

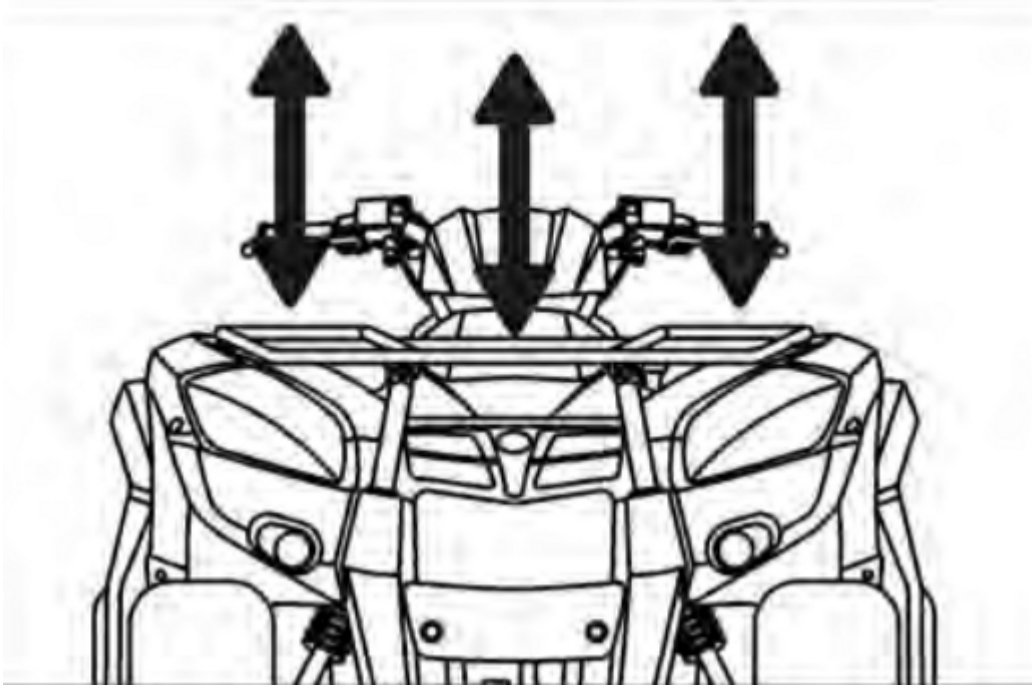
Directional Rotation



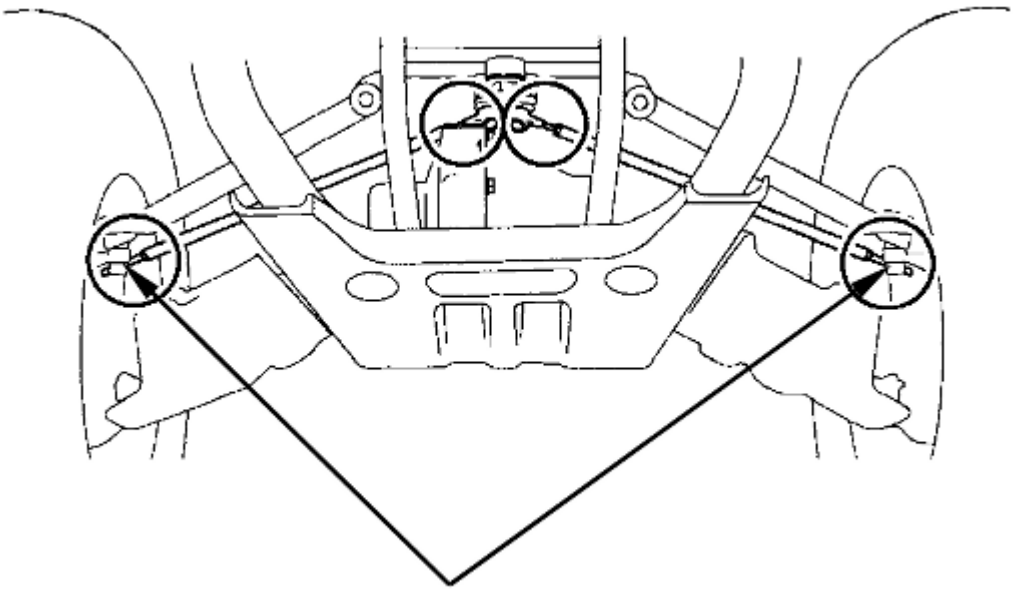
Check the "ROTATION" arrow on the tire's sidewall.The arrow indicates the direction in which the tire should turn going forward.

Suspension and Steering Inspection

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.



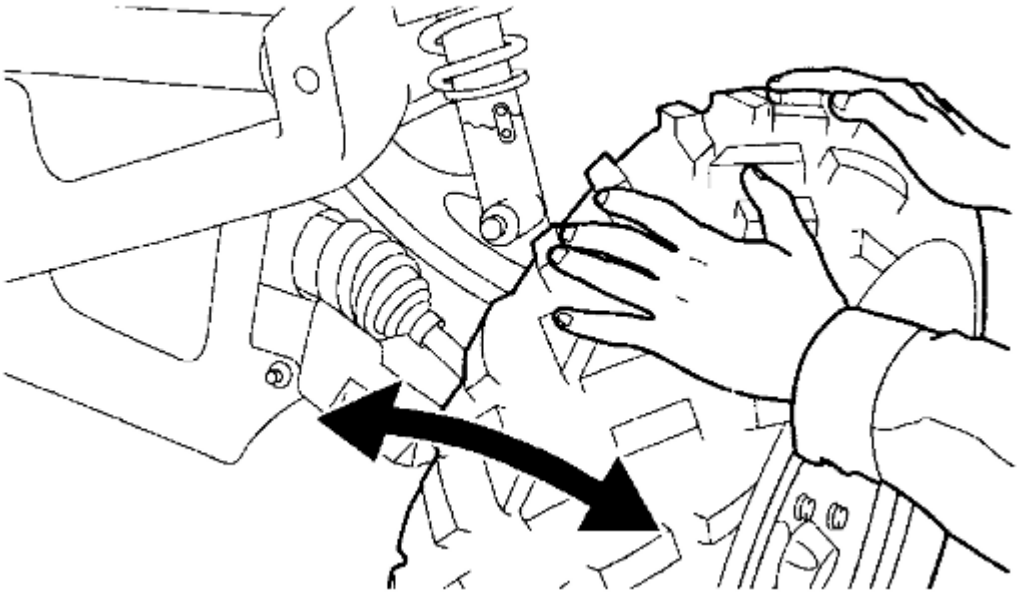
Place the machine on a level place. Check the steering column bushings and bearings: Move the handlebar up and down, and/or back and forth. Replace the steering column bushings and or bearings if excessive play. See the Steering Shaft topic for more information.



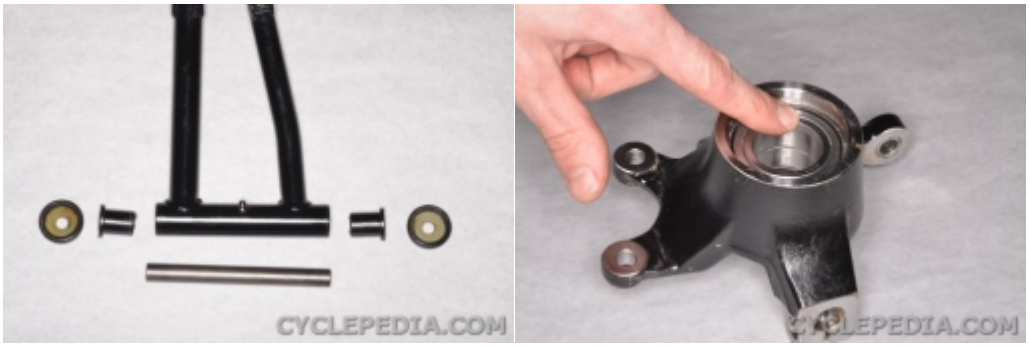
Tie-rod Ends

Check the tie-rod ends Turn the handlebar to the left and/or right until it stops completely, then gradually move the handlebar from left to right.

Replace the tie-rod ends if tie-rod end has any vertical play. See the Tie-Rods topic for more information.



Raise the front end of the machine so that there is no weight on the front wheels. Check ball joints and/or wheel bearings. Move the wheels laterally back and froth.



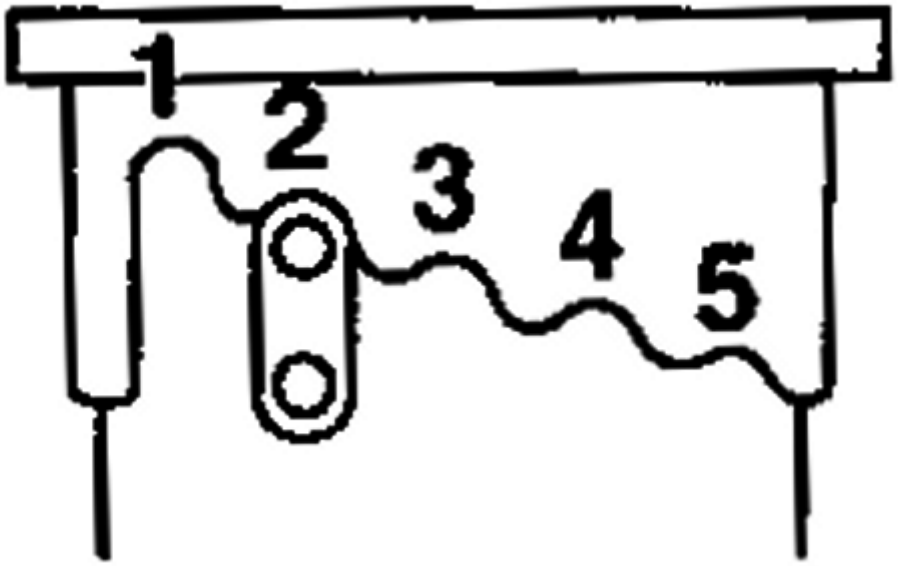
Replace the front arms and/or wheel bearings if there excessive free play. See the A-arms and Steering Knuckles topics for more information.

Inspect the rear suspension in the same manner. See the Rear Suspension chapter for more information.

Pre-load

The shock absorbers have adjustable preload collars.

Turn the preload collar with a pin spanner to adjust the spring preload.
Increase the amount or preload for heavy loads.
Note: Always adjust both front shock absorber spring pre-load to the same setting. Uneven adjustment can cause poor handling and loss of stability.



Standard position: 2
Minimum (Soft) position: 1
Maximum (Hard) position: 5

Toe-in Check

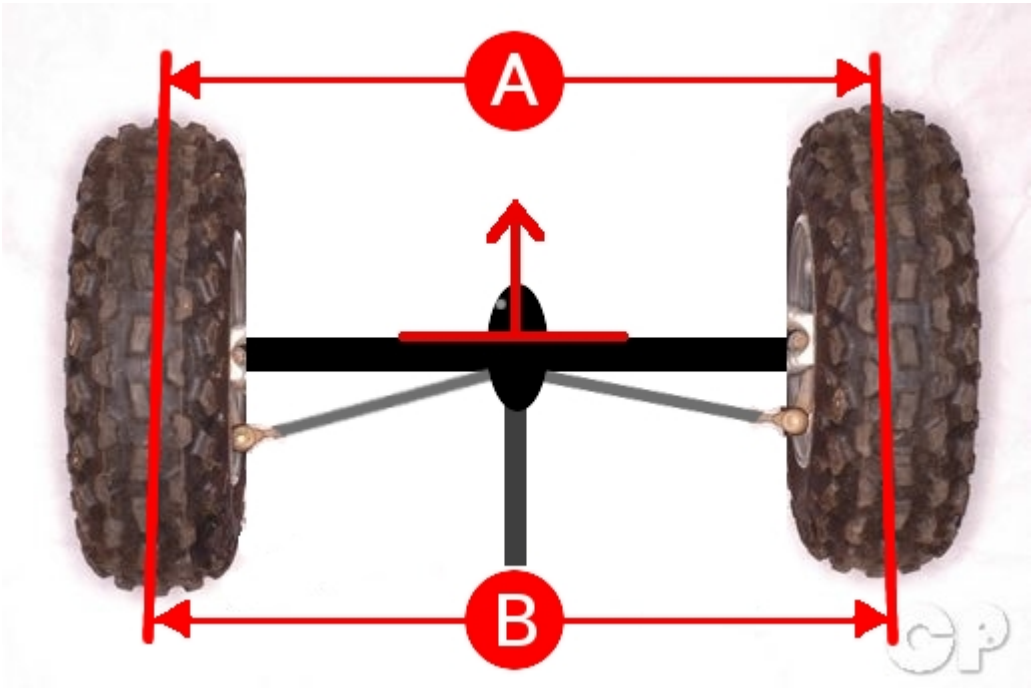
Make sure the vehicle is clean and mud free. Position the vehicle on a level surface at its operating weight without a rider.

Check that all tires are properly inflated at the same pressure. See the Tires topic for more information.

Mark the center of both front tire treads.

Raise the front tires off the ground.

Straighten the front wheels on a level surface. The handlebar must be positioned straight ahead. Measure the handlebar position on each side to confirm this. Do not change the handlebar position from straight ahead.



Measure the distances between the center of the tires with a toe-in-gauge on the front of the tires. Call this measurement A. Rotate the tires 180°. Measure the distances between the center of the tires with a toe-in-gauge on the rear of the front tires. Call the rear measurement B.

The toe-in measurement = B - A.

Toe-in: 0~15 mm (0~0.59 in)

Adjustment

Mark the tie-rods for reference.

The outer tie-rod locknuts have reverse threads.

Loosen the tie-rod locknuts with a 19 mm wrench.

Turn the tie-rod flats with a 17 mm wrench.

Turn the tie rods evenly until till the toe-in is within specification. Moving the tie-rods out towards the wheels will narrow the distance between the front of the tires. Moving the tie-rods towards the center will increase the distance between the front of the tires.

Make sure the tie-rod joints are sitting in the middle of their range of motion.

Temporarily tighten the tie-rod locknuts with a wrench and re-check the toe in.

Note: The outer tie-rod locknuts have reverse threads.

Tighten the tie-rod locknuts to specification with a 19 mm wrench.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Tie-rod adjusting nut	4	10	3.5 (35, 25.5)

After adjusting the toe-in take the machine for a slow test ride. If the machine pulls to the left or right when the steering wheel is facing straight ahead the toe-in needs to be readjusted more evenly.

Valve Clearance

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

MXU 700i

Inspection

The engine has to be cold (room temperature) to check the valve clearance.

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Right mudguard	Mudguards and Footrests
Spark plug	Spark Plug

Loosen the timing inspection plug with a large flat blade screwdriver. Remove the timing inspection plug and inspect its O-ring.

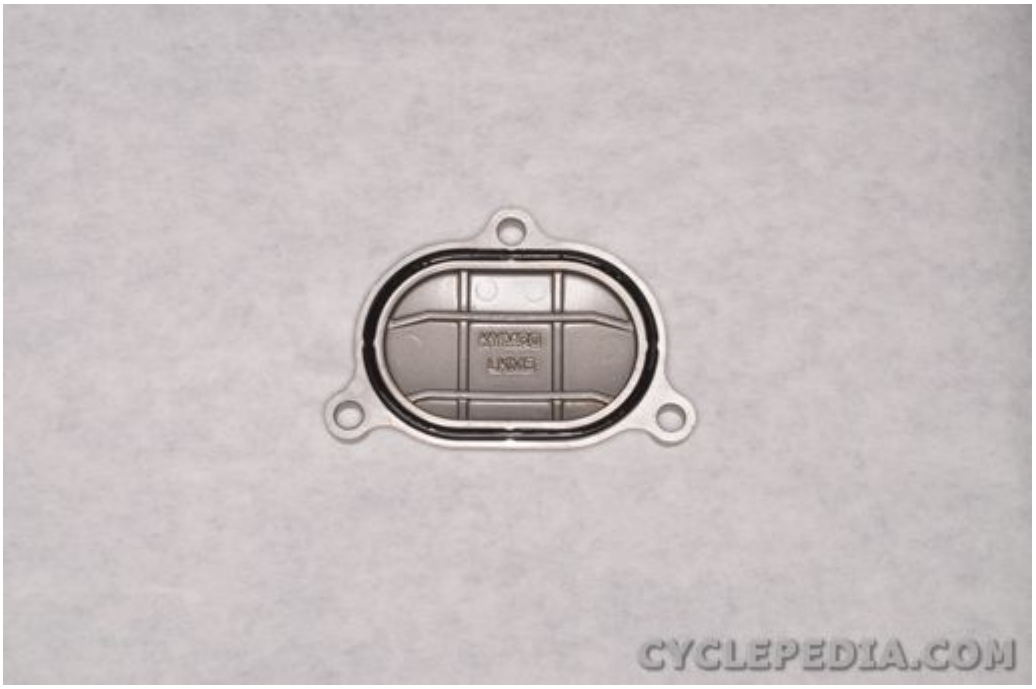
Remove the crankshaft cap on the left side of the engine with a 10 mm Allen socket.

Inspect the O-ring and replace it as needed.

The valve adjuster covers are each held on with three bolts.

Remove the valve adjuster cover bolts with an 8 mm socket.

Lift off the valve adjuster covers.

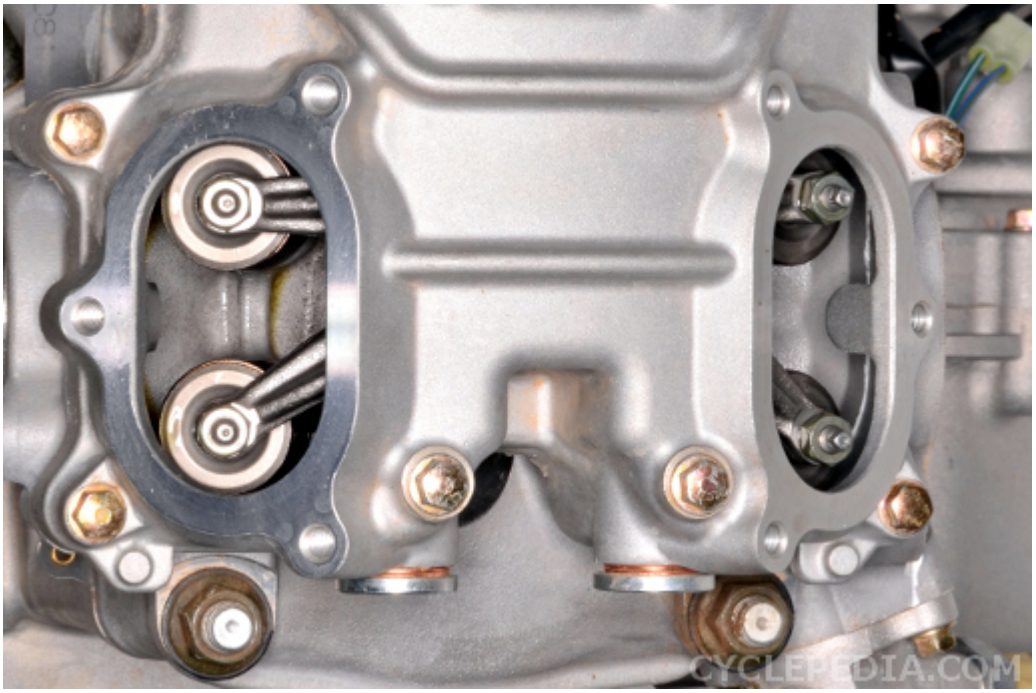


Inspect the valve adjuster cover O-rings and replace them as needed.

The piston should be at TDC (Top Dead Center) on the compression stroke to check the valve clearance. Turn the crankshaft clockwise with a 19 mm socket. Observe the movement of the intake valves and check the position of the flywheel through the timing hole.

The intake valves should open and close.

Align the "T" mark on the flywheel with the index mark on the crankcase cover. This shows the piston is at Top Dead Center (TDC).



The piston should now be at TDC (Top Dead Center) on the compression stroke. You can make sure that it is on the compression stroke by checking that there is some slack in the rocker arms. If the rocker arms are rigid, rotate the crankshaft 360° until the "T" mark is once again aligned with the notch on

the case cover. There should now be slack in the rocker arms and the piston should be at TDC on the compression stroke.

Measure the valve clearance with a thickness feeler gauge. Insert the feeler gauge between the adjusting screw and the valve stem. The clearance is correct when there is a light drag on the feeler gauge. If the clearance is out of spec move on to the adjustment section.

Valve clearance (cold)	IN	0.1 mm (0.004 in)
	EX	0.18 mm (0.007 in)

Adjustment

Use a valve adjuster tool to adjust the valves.

Special Tool- Valve Adjuster: A120E00080

Loosen the valve adjuster locknut with a wrench. Use the valve adjuster tool to turn the adjuster in or out.

If the valve clearance is too tight back out the valve adjusting screw with the valve adjustment tool. If the clearance is too loose turn in the valve adjusting screw until there is a light drag on the feeler gauge. Hold the adjusting screw locknut in place with the wrench to make sure it doesn't interfere with the adjustment. Hold the adjuster in place when you tighten the locknut. Always recheck the clearance after tightening the locknut.

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES	
		N-m	ft-lb
TAPPET ADJ. NUT	M5 x 0.5	6.9-10.8	5.1-7.9

Assembly

Make sure the valve adjuster cover O-rings are in good condition. Apply a light coat of fresh engine oil to the O-rings. Fit the valve adjuster covers into place.

Install the valve adjuster cover bolts. Tighten the bolts securely with an 8 mm socket.

Make sure the crankshaft cap O-ring is in good condition. Apply fresh engine oil to the O-ring.

Install the crankshaft cap.

Tighten the crankshaft cap securely with a 10 mm Allen socket. Do not over tighten this cap.

Make sure the timing plug O-ring is in good condition. Apply fresh engine oil to the O-ring.

Install the timing inspection plug and tighten it securely with a large flat blade screwdriver.

Install these components	
Component	Topic
Spark plug	Spark Plug
Right mudguard	Mudguards and Footrests
Side covers	Side Covers
Fuel tank and shield	Fuel Tank
Seat	Seat

MXU 500i

Inspection

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Right mudguard	Mudguards and Footrests
Recoil starter cover	Recoil Starter Cover
Spark plug	Spark Plug
Cylinder head cover	Cylinder Head Cover

Remove the timing cap on the right side of the engine with a flat blade screwdriver. Inspect the O-ring and replace it as needed.

Turn the crankshaft clockwise with a 19 mm socket.

Align the "T" mark on the flywheel with the index mark on the right crankcase cover. This shows the piston is at Top Dead Center (TDC).

Make sure the punch marks on the ends of the camshafts are pointed up. With the marks pointing up the piston is at TDC on the compression stroke. If the punch marks are not pointing up rotate the crankshaft clockwise until the piston is at TDC on the compression stroke.

Measure the valve clearance with a thickness feeler gauge. Insert the feeler gauge between the adjusting screw and the valve stem. The clearance is

correct when there is a light drag on the feeler gauge. If the clearance is out of spec move on to the adjustment section.

Valve clearance	Intake	0.1 mm (0.004 in) (cold)
Valve clearance	Exhaust	0.1 mm (0.004 in) (cold)

Adjustment

Use a valve adjuster tool to adjust the valves.

Special Tool-
VSpecial Tool- Valve Adjuster: A120E00080

Loosen the valve adjuster locknut with a wrench. Insert the valve adjuster tool through the opening as shown.

If the valve clearance is too tight, back out the valve adjusting screw with the valve adjustment tool. If the clearance is too loose, turn in the valve adjusting screw until there is a light drag on the feeler gauge. Hold the adjusting screw locknut in place with the wrench to make sure it doesn't interfere with the

adjustment. Hold the adjuster in place when you tighten the locknut. Always recheck the clearance after tightening the locknut.

ITEM	N-m	kgf-m	ft-lb
Valve clearance adjuster locknut	9	0.9	6.5

Assembly

Install the timing cap on the right side of the engine and tighten it securely with a flat blade screwdriver.

Install these components	
Component	Topic
Cylinder head cover	Cylinder Head Cover
Spark plug	Spark Plug
Recoil starter cover	Recoil Starter Cover
Right mudguard	Mudguards and Footrests
Side covers	Side Covers
Fuel tank and shield	Fuel Tank
Seat	Seat

Note: If you are viewing this document offline be sure to visit the latest version online at http://www.cyclepedia.com before attempting any repairs. Updates are made without notice.

3.Fuel System MXU 700i

This chapter covers the location and servicing of the fuel system components for the fuel injected KYMCO MXU 700i models.

1.Airbox 3-4
2.Check Engine Lamp (CELP) 3-10
3.Component Location 3-15
4.Diagnostic Tool 3-21
5.Fuel Injection Sensors 3-37
6.Fuel Injector 3-51
7.Fuel Pump 3-66
8.Throttle Body Removal 3-82
9.Throttle Body Components 3-100

General Service Information

● Be sure to relieve the fuel pressure before fuel pump or fuel hose removal.

● Bending or twisting the control cables will affect operation and could cause the cables to stick or bind, resulting in loss of vehicle control.

● Work in a fully ventilated area. Smoking or allowing flames or sparks in the work area or where gasoline is stored can cause a fire or explosion.

● Do not apply carburetor cleaners to the inside of the throttle body.

● Do not snap the throttle valve from fully open to fully close after the throttle cable has been removed; this may cause incorrect idle speed.

● Do not loosen or tighten the painted bolts and screws of the throttle body. This can cause throttle and idle valve synchronization failure.

● Seal the cylinder head intake ports with tape or a clean towel to prevent dirt and debris from entering the intake ports after the throttle body has been removed.

● Do not damage the throttle body. It may cause incorrect throttle and idle valve synchronization.

● When the fuel pump is removed make sure it is stored in a clean area where it cannot fall and be damaged. Also, be sure the fuel pump isn't resting on the fuel level sensor float arm.

● Always replace the fuel pump seal when the fuel pump is removed.

● The electronic fuel injection system is equipped with the self-diagnostic system. If the Check Engine Lamp “CELP” lights while riding, follow the self-diagnostic procedures to solve the problem.

● A faulty fuel injection problem is often related to poorly connected or corroded connectors. Check those connections before proceeding.

● When disassembling the fuel injection parts, note the location of the O-rings. Replace them with new ones upon reassembly.

● Do not disconnect the battery negative (-) or positive (+) cable while engine is running, it may cause ECU damage.

● Do not disconnect or connect the ECU connector while the ignition switch is in the ON position; it may cause the ECU damage.

TROUBLESHOOTING

Engine fail to start

• Battery voltage too low
• Fuel level too low
• Pinched or clogged fuel hose
• Faulty fuel pump operating system
• Clogged fuel injector
• Faulty spark plug or wrong type
• Clogged Airflow Bypass Valve
• Wet spark plug

Backfiring or misfiring during acceleration

• Ignition system malfunction

Engine stall, hard to start, rough idling

• Intake air leak
• Fuel contaminated/deteriorated
• Pinched or clogged fuel hose
• Idle speed fail to adjust
• Wet spark plug

Poor performance (drive ability) and poor fuel economy

• Pinched or clogged fuel hose
• Faulty injector

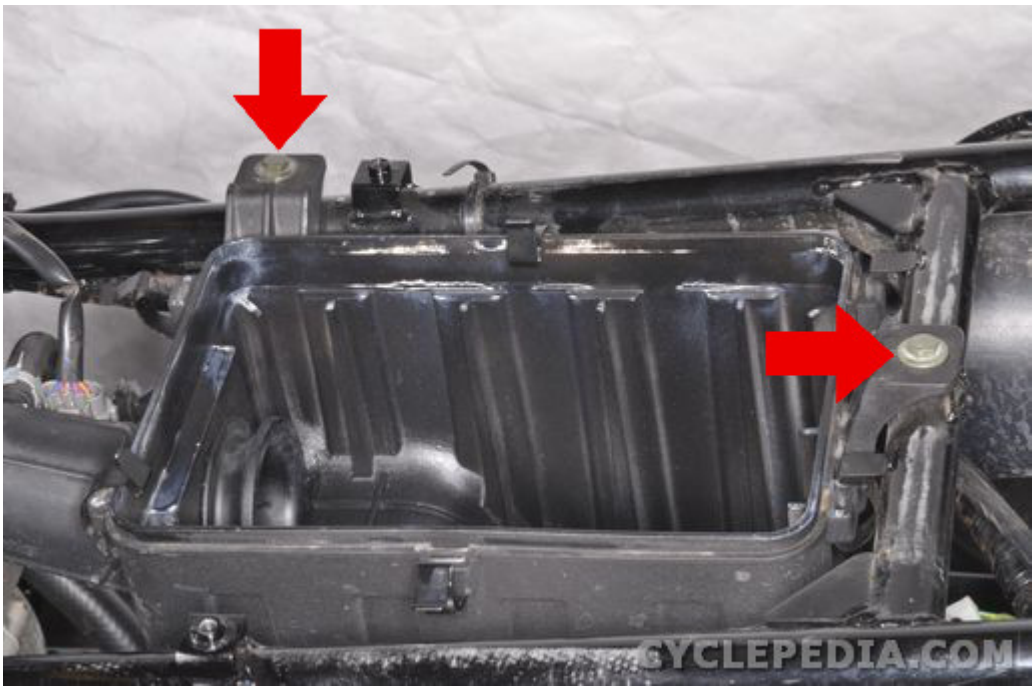
Airbox

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the air filter. See the Air Filter Servicing topic for more information.

Squeeze the breather hose clip and slide it back. Free the breather hose from the airbox boot.



Remove the two airbox mounting bolts.

Loosen the throttle body to airbox clamp with a #2 Phillips screwdriver.

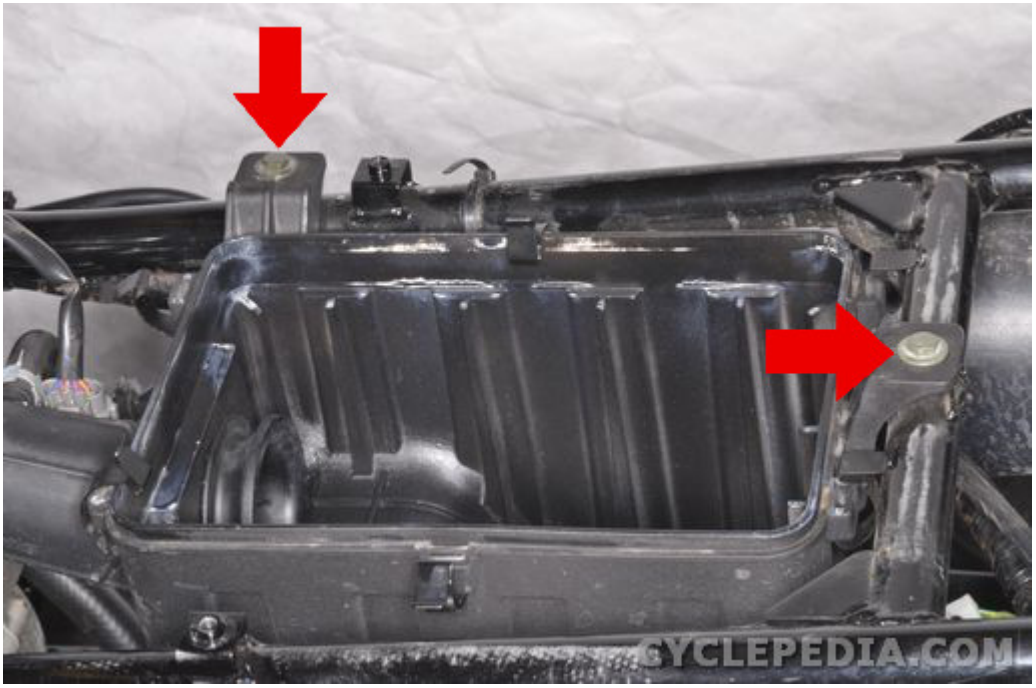
Free the airbox from the throttle body. Remove the airbox.

Cover the mouth of the throttle body with a clean shop towel or tape to prevent debris from entering the engine.

Installation

Fit the airbox into place.

Connect the airbox to the throttle body.



Install the bracket and two airbox bolts. Tighten the airbox bolts securely.

Tighten the airbox to throttle body clams securely with a #2 Phillips screwdriver.

Connect the breather hose to the airbox boot. Secure the hose with the clamp.

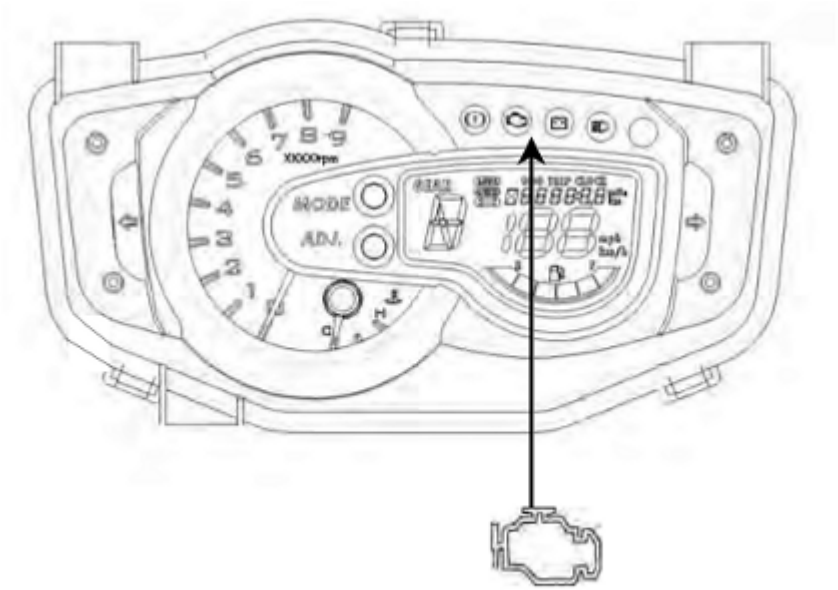
Install the air filter. See the Air Filter Servicing topic for more information.

Check Engine Lamp (CELP)

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

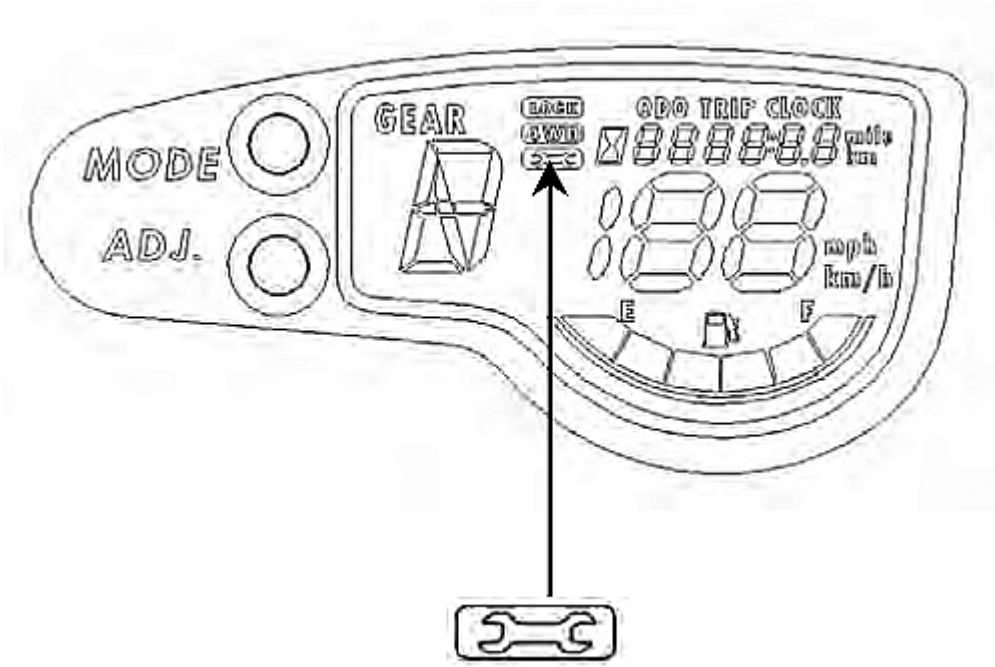
Display Indicators

Note: The check engine lamp (CELP) will come on for 2 seconds when the key is turned on. It should go off when the engine is started. If it lights after this the system has detected a problem. The vehicle should be immediately diagnosed as to what is causing the light to come on.



CELP (Check Engine Lamp)

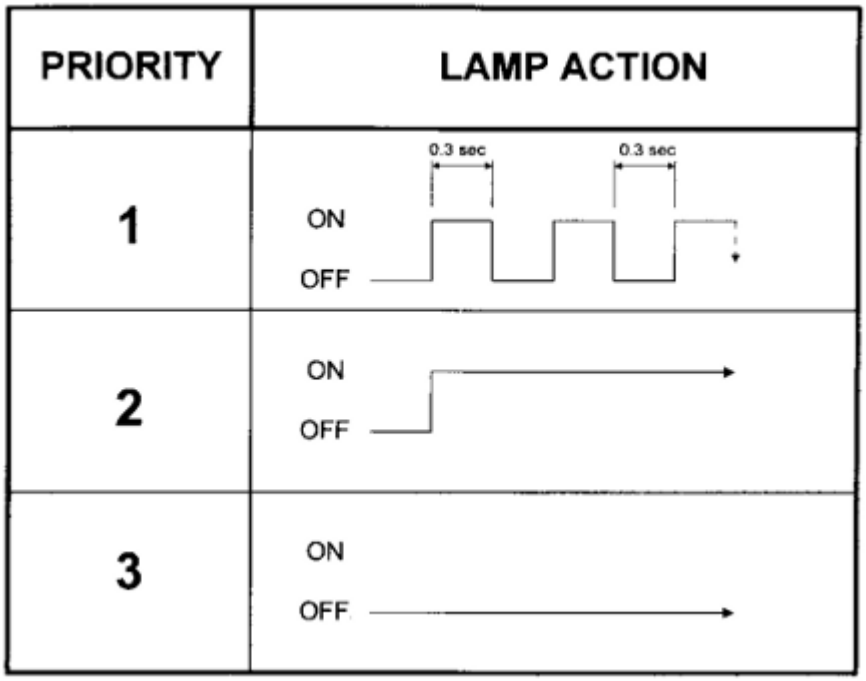
The check engine lamp (CELP) is located on the instrument display.



The wrench icon on the display will come on when the key is turned on and go away when the engine has started. If the wrench icon come on the this indicates and EFI system electric part fault and and a failure code is present.

Failure Code Indicator

If the ECU connectors, or battery leads are disconnected the stored malfunction codes will be lost.



There are 3 priority levels of the CELP while the engine is running.

Priority grade 1: The CELP blinks continuously letting you know this is the most severe condition. The rider must slow and immediately take the vehicle to the dealership service center for evaluation.

Priority grade 2: The CELP lights and doesn't blink, but stays on continuously. This shows a component is experiencing trouble or something has gone wrong with a circuit. Evaluate the trouble code to find the source of the problem.

Priority grade 3: The CELP blinks once and doesn't come back on. This is a warning. Example - the engine rpm was too high for a short time.

Without Diagnostic Special Tool

SELF-DIAGNOSTIC PROCEDURES

● Turn key to the ON position.

● The CELP will light for two seconds and then go off.

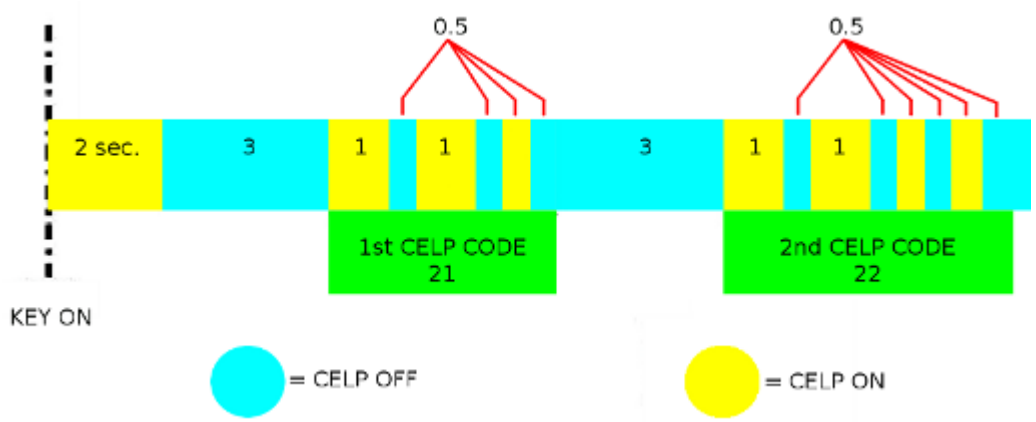
● If the engine has problem, the CELP will blink to show the failure codes.

● There’re 22 failure codes for the Synerjet M3C system.

If the vehicle gets multiple failure codes, the CELP will display the lower number code, then progress to the higher number after four seconds. The failure codes will display repeatedly. After the codes cycle four times the codes will clear from the system memory.

EFI SELF-DIAGNOSIS FAILURE CODES

The CELP denotes the failure codes. When the indicator lights for one second that is equal to ten. A half second blink is equal to one.



In the example above the first code has two long blinks (10 X 2) and one short blink (+ 1). This equals 21 blinks.

(10 X 2) + 1 = 21

The second code in the example shows three seconds after the first. The second code has two long blinks (10 X 2) and two short blinks (+ 2). This equals 22 blinks.

(10 X 2) + 2 = 22

In this example the failure codes corresponding with 21 and 22 blinks need to be evaluated.

To see the full list of trouble codes see the Diagnostic Trouble Codes (DTCs) topic.

With Special Tool

See the Fuel Injection Diagnostic Tool topic.

Self-Diagnosis Reset Procedure

After the codes cycle four times the codes will clear from the system memory. Always clear the memory after fixing the problem to prevent the light from showing the next time the vehicle is used.

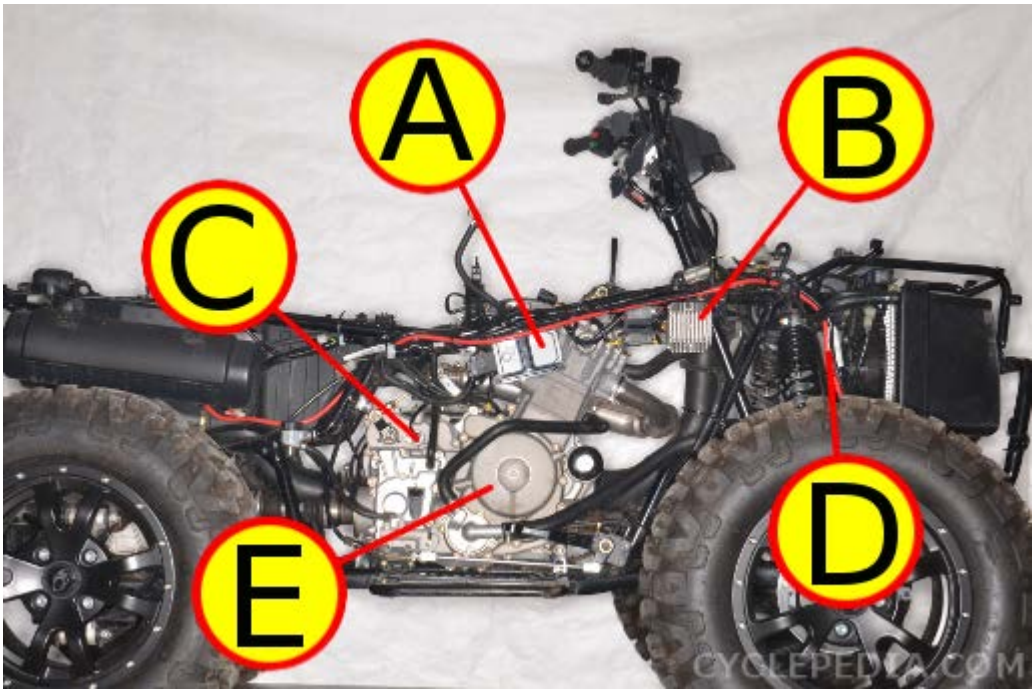
TPS/ISC Reset

Start the engine and let it idle until the engine temperature has reached 85° C (185° F). The ECU will learn the new setting.

Component Location

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Right Side



A. ECU

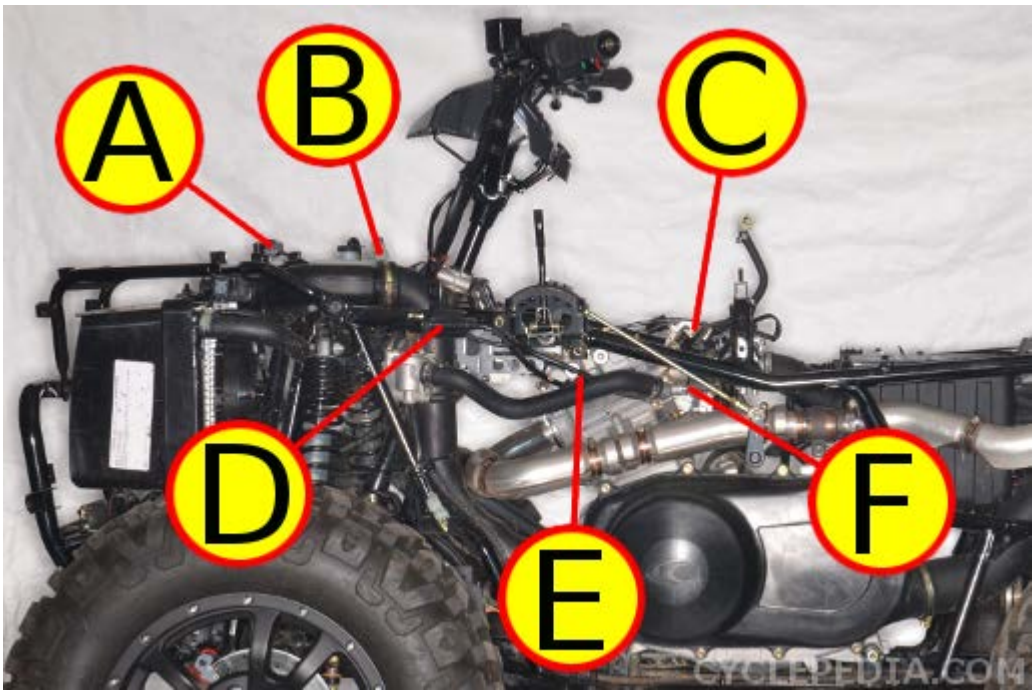
B. Regulator/Rectifier

C. Gear Position Switch

D. Winch Leads

E. Stator Coil and Ignition Pulse Generator / Crank Position Sensor

Left Side and Center



A. Roll Sensor (Tip-over Switch)

B. Diagnostic Tool Connector

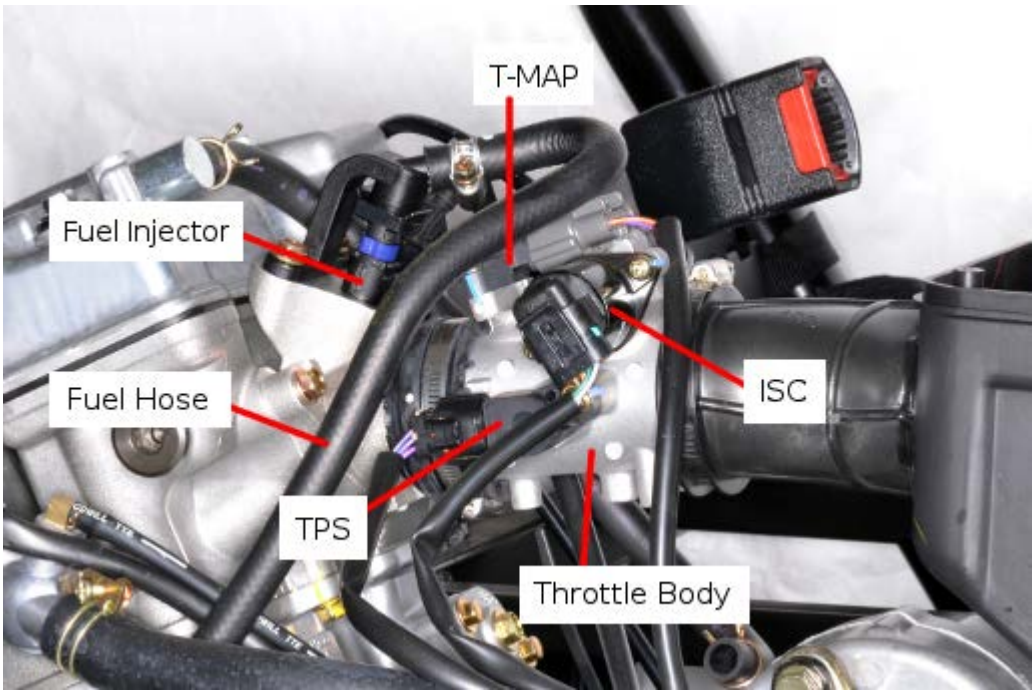
C. Throttle Body

D. Ignition Coil

E. Spark Plug

F. Water Temperature Sensor

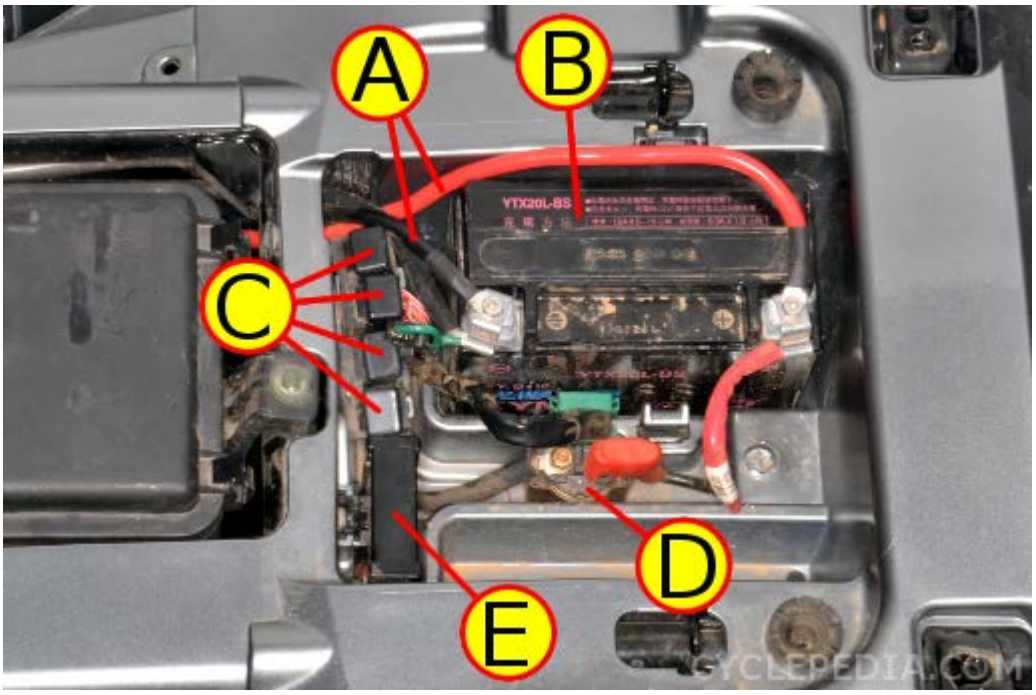
Throttle Body



The following components can be found here.

- Throttle Body
- T-MAP (Manifold Air Pressure)
- Fuel Injector
- Fuel Hose
- TPS (Throttle Position Sensor)
- ISC (Idle Speed Control)

Under The Seat



A. Winch Leads (optional)

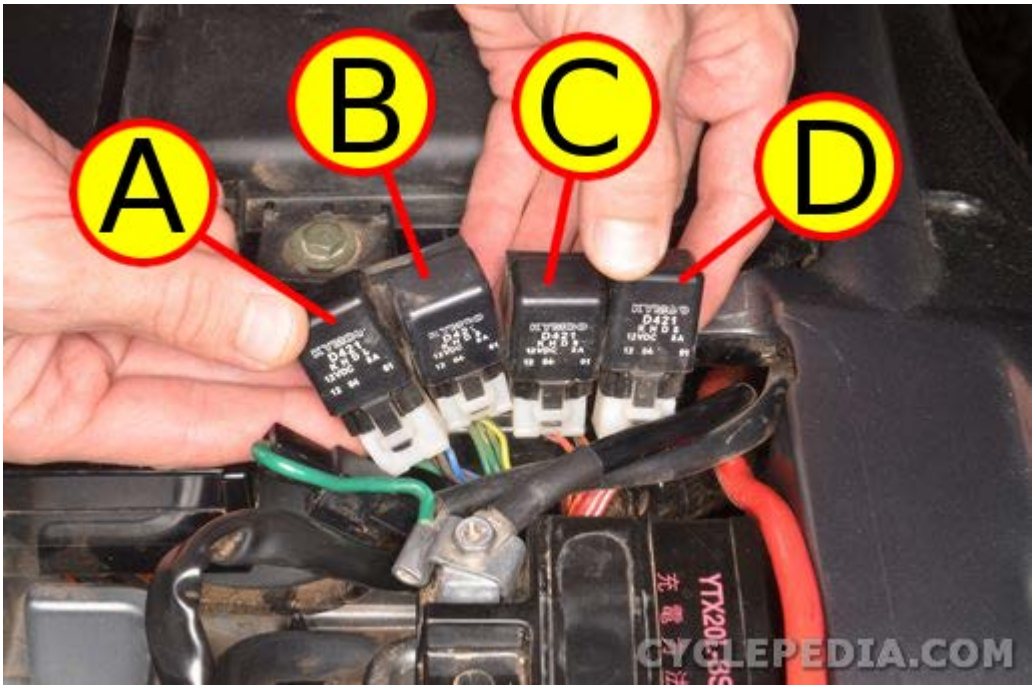
B. Battery

C. Relays (see below)

D. Starter Relay

E. Fuse Box

Relays



A. Fan Relay

B. Engine Start Relay

C. Fuel Pump Relay

D. Switched Power Relay

Fuel Pump

The fuel pump is located inside the fuel tank.

Diagnostic Tool

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

OPERATION INSTRUCTIONS

Diagnostic tool Part Number: 3620A-LEB2-E00
CAN Linker Part Number: 3620A-LGC7-E000

This tool has been developed by KYMCO and for KYMCO vehicles only.

The tool software can be updated for new models with a computer via the USB cable.

Please refer to the specifications when servicing this vehicle. See the Specifications topic for more information.

This tool does not have an internal battery. The power for the tool is provided by the vehicle when connected. The vehicle should have a fully charged battery when using the diagnostic tool.

Set the transmission shifter in the P or N position.

Plug the diagnostic tool connector into the CAN Linker as shown.

Remove the front cover to access the diagnostic tool connector. See the Front Cover topic for more information.

Remove the dummy side of the connector.

Set a multimeter to reads voltage (DCV). Measure the voltage as indicated.

Terminal (+)	Terminal (-)	Normal
BR/L	G/B	Battery Voltage
B/L	W/L	Battery Voltage - 1

Connect the CAN Linker to the diagnostic plug.

Turn on the ignition switch to send power to the tool.

The FI tool has three buttons and two lights below the screen. The left button is the up button that will move the selector up. The right button is the down button that moves the selector down. The middle button is ENTER. This will select the item you have chosen. The left light indicated the tool has power, and the right light indicates a Diagnostic Trouble Code (DTC) is present.

The functions of the diagnostic tool include ECU version, model name, data analysis and adjust.

ECU version: includes model name, ECU number, identifications number and software version.

DTC Inspect: DTC reading, DTC clearing, and troubleshooting.

Data Analyze: For ECU's setting inspection and running condition analysis.

Adjust: Not allowed

ECU Version

The four functions will display when the tool is powered on. The model name will show LKM5 for the MXU 700i.

Pressing the enter button on the ECU version will show information on the ECU software and calibration.

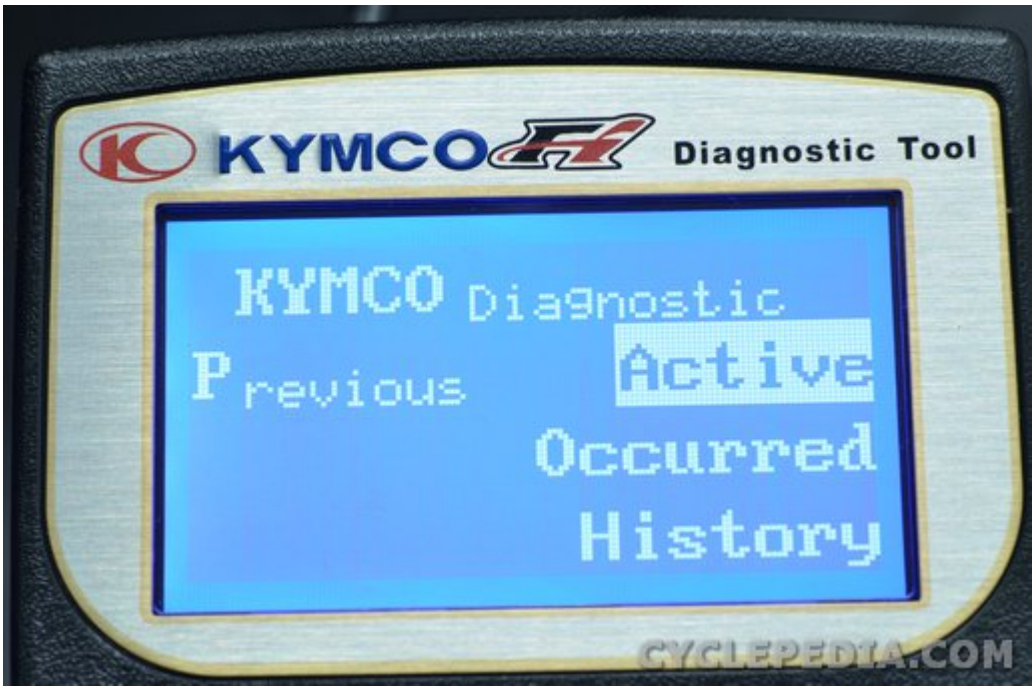
Press the down button (right) to return to the first page.

DTC (Diagnostic Trouble Code)

INSPECTION PROCEDURE

Press the down button (right) to move the item selector down to the DTC Inspect item.

Pressing the enter button on the DTC Inspect item will bring up the options shown above. Select the DTC Load option and press the enter button to display the DTC options.



There are three DTC options - Active, Occurred, and History.

Move the selector to the Active option and press enter to display current DTC.

The diagnostic tool will display all current DTC. In the photo above only one code (12) is showing. Select the code number of interest and press enter for more information on that DTC.

In this instance the indicated code is 12 (CELP blinks). This corresponds to the DTC P0230.

Blinks	Failure Codes	Fault description	Priority	Fault management
12	P0230	Fuel pump relay or electric circuit malfunction	2	1. Make sure the relay connector is connected correctly. 2. Check if the ECU sends a signal to relay. 3. Check the fuel pump relay resistance

Consult the DTC table for more information on how to troubleshoot the problem. See the Diagnostic Trouble Codes (DTCs) topic

Up button and select the previous options to return to the original screen.

DTC Clear Procedure

Press the down button (right) to move the item selector down to the DTC Inspect item.

Pressing the enter button on the DTC Inspect item will bring up the options shown above. Move the selector down to the Clear DTC option and press enter.

The diagnostic tool will show when the DTC in memory is cleared. Also, the DTC indicator light will be off.

Data Analysis Procedure

When using the data analysis feature for running condition items such as ignition advance, ISC step, ect., make sure the engine temperature has reached 80° C. The engine temperature is displayed on data analysis page 03.

Press the down button (right) to move the item selector down to the DATA Analyze item. Press enter to bring up the DATA Analyze page 01 shown below. Press the down button to continue through the seven DATA Analyze pages.

Page 01

The 01 page shows engine speed, idle speed set point, and battery voltage.

Page 02

The 02 page shows TPS position and TPI idle adapted.

Page 03

The 03 page shows engine temperature, air temperature, and intake pressure.

Page 04

The 04 page shows atmospheric pressure, fuel injection interval, and ignition advance.

Page 05

The 05 page shows the rollover voltage.

Page 06

The 06 page shows the ISC step and ISC learn step.

Page 07

The 07 page shows the ECU counter.

Fuel Injection Sensors

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

You will need a digital multimeter to inspect the sensors.

Water Temperature Sensor (WTS)

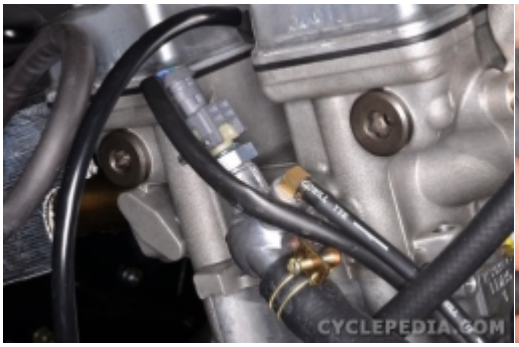
Removal

Remove the left side cover. See the Side Covers topic for more information.

Drain the coolant. See the Coolant topic for more information.

Turn the ignition switch to the OFF position.

The WTS is located on the left side of the cylinder head.



Push in the spring and unplug the WTS sensor connector.

Remove the sensor with a 22 mm wench.

Installation

Thread in the WTS. Tighten the WTS to specification with a deep well 22 mm socket.

ITEM	N-m	kgf-m	ft-lb
WTS	12	1.2	8.6

Inspection

Input Voltage

Turn the ignition switch to the OFF position.

Push in the spring and unplug the WTS sensor connector.

Set the multimeter to read voltage (DCV).

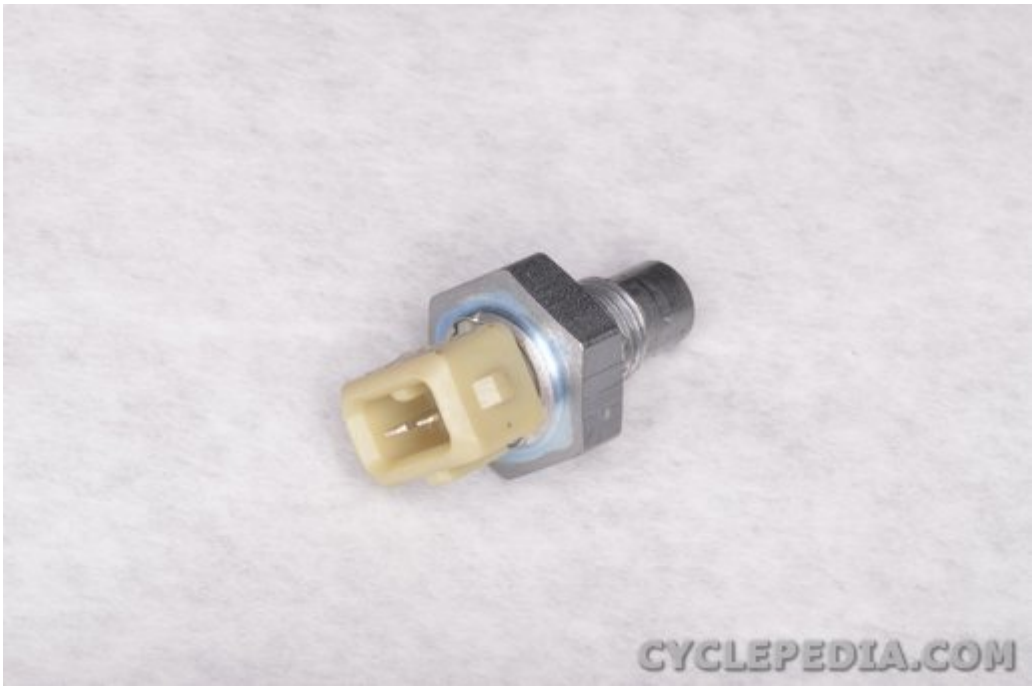
Turn the ignition switch to the ON position.

Measure the input voltage on the harness side of the connector.

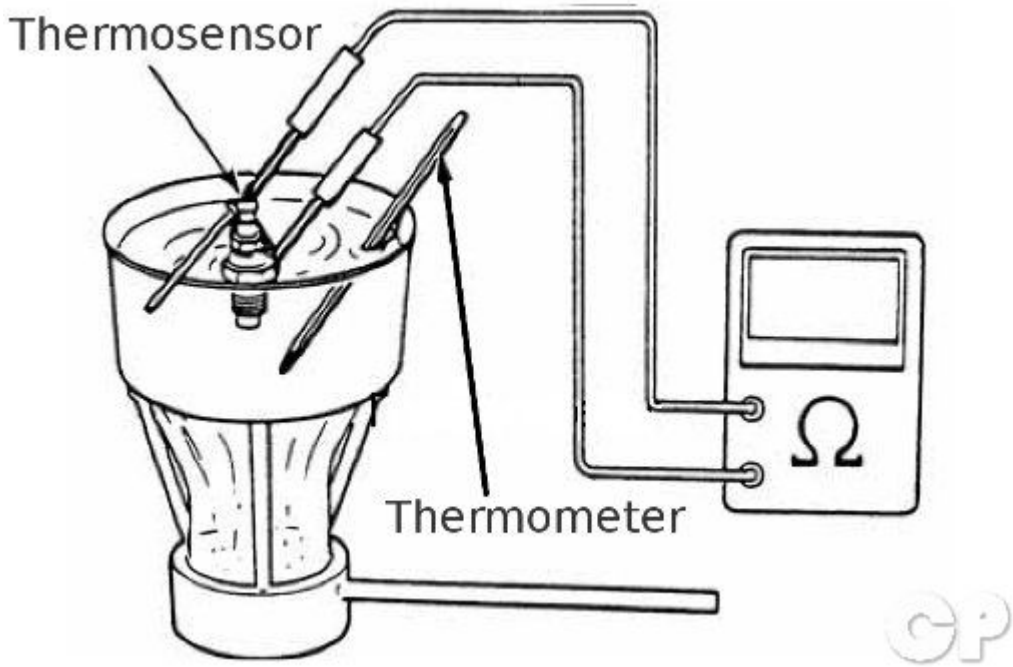
(WTS Input Voltage: 5 ± 0.1 V)

If the input voltage is out of specifications check the offending wires for a short or open lead.

Resistance



Set the multimeter to ohms of resistance (Ω).



Suspend the sensor and a thermometer in a pot of coolant with string. Make sure the WTS and the thermometer are not touching the pot. Bring the

temperature up to the specification slowly and check the resistance between the sensor terminal and body.

Temperature	Standard Resistance (approximate)
60° C (140° F)	703.8 ± 40.9 Ω
90° C (194° F)	260.7 ± 15.1 Ω
120° C (248° F)	111.1 ± 7.8 Ω

Manifold Air Temperature Pressure (T-MAP)

To remove and install the sensors on the throttle body see the Throttle Body Components topic.

Input Voltage Inspection

Turn the ignition switch to the OFF position.

Unplug the T-MAP connector.

Set the multimeter to read voltage (DCV).

Turn the ignition switch to ON position.

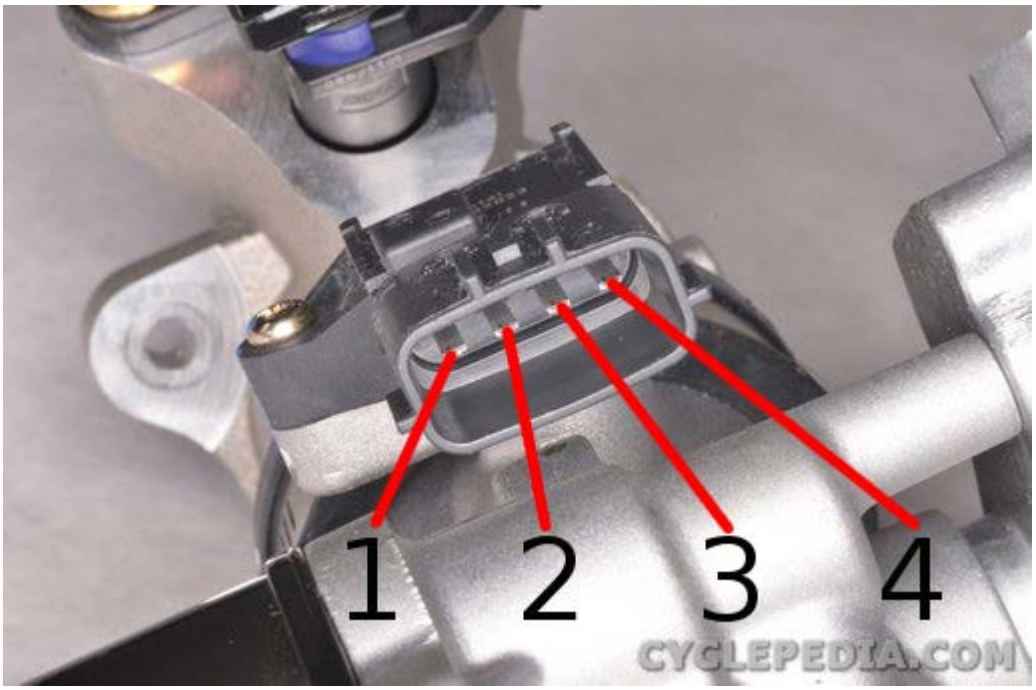
Measure if the ECU voltage outputs to the MAP between the following terminals of the MAP connector.

Terminal	Normal
Violet/Red (+) – Violet/Green (-)	5 V

If the input voltage is out of specifications check the offending wires for a short or open lead.

Resistance

Set the multimeter to ohms of resistance (kΩ).



Measure the resistance between the 3 and 4 pins of the T-MAP sensor.

ITEM	SPECIFICATION
T-MAP sensor resistance (20°C)	1613 - 2544 Ω

To replace the T-MAP sensor see the Throttle Body Components topic.

Throttle Position Sensor

Input Voltage Inspection

Unplug the TPS connector.

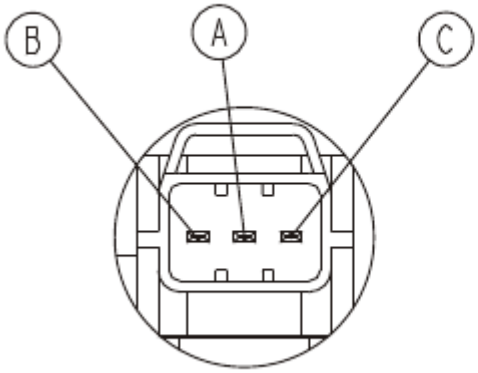
Turn the ignition switch to “ON”.

Measure if the ECU voltage outputs to TPS between the following terminals of the TPS connector.

Terminal	Normal
Violet/Red (+) – Violet/Green (-)	5 V

Resistance Inspection

Set the multimeter to ohms of resistance (kΩ).



ID	DESIGNATION
A	GND
B	OUTPUT
C	INPUT

Measure the resistance between the ground (A) and input (C) terminals of the TPS.

Throttle Position Sensor (TPS) resistance (at 20°C/68°F)	3500 - 6500 Ω

Data Analysis

Bring up data analysis page 02 to see information on the TPS. See the Diagnostic Tool topic for more information.

The TPS voltage should display as indicated in the table per the throttle position.

Throttle Position	Opening Angle	Standard
Close	0 %	0.67 ± 0.05 V
Open	> 90 %	1.8 - 2.3 V

To replace the TPS see the Throttle Body Components topic.

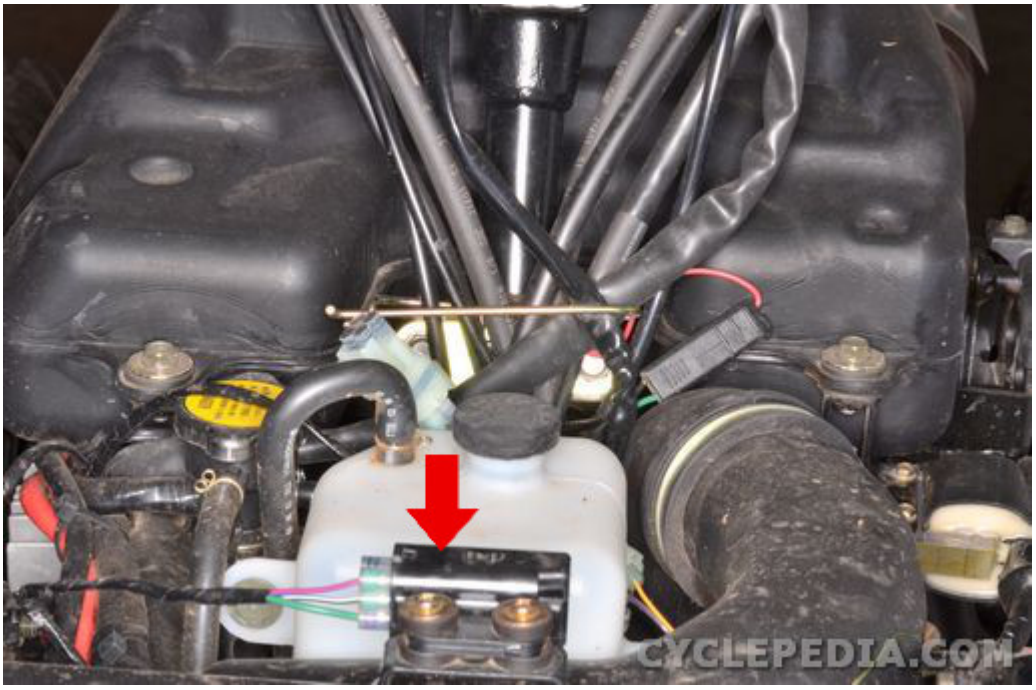
Crankshaft Position Sensor (CKP)

See the ignition pulse generator in the Generator Cover topic.

Roll Sensor / Tip-Over

Removal and Installation

Remove the front fender upper cover. See the Front Fender topic for more information.



The roll sensor is mounted on the frame in front of the steering shaft.

Remove the two roll sensor screws with a #2 Phillips screwdriver.

Unplug the roll sensor and remove it.

Plug in the roll sensor and install it so the UP mark faces up. Tighten the two roll sensor screws securely with a #2 Phillips screwdriver.

Inspection

Turn the ignition switch to the OFF position.

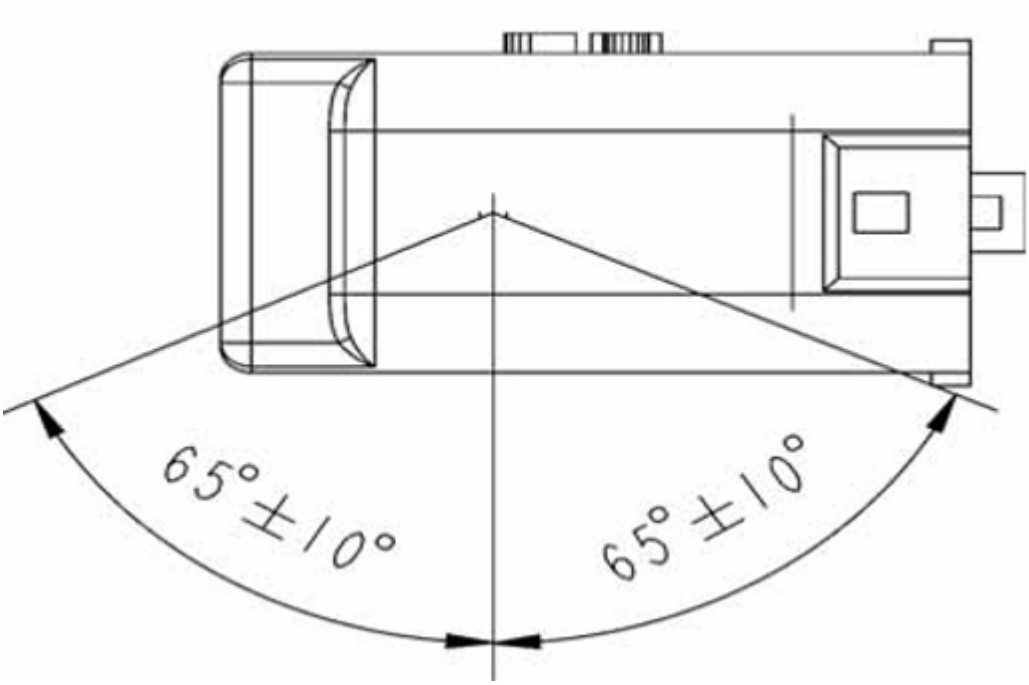
Remove the roll sensor screws, but leave the sensor plugged in.

Set the multimeter to read voltage (DCV).

Turn the ignition switch to the ON position.

Measure the voltage of the roll sensor wires with the connector plugged in and the sensor in the regular upright attitude.

Terminal	Normal
Violet/Red (+) - Green (-)	5 V (ECU Voltage)
Black/White (+) - Green (-)	0.4 - 1.4 V



Incline the roll sensor 65 ± 10 degrees to the left or right. Check the voltage.

Terminal	Normal
Violet/Red (+) - Green (-)	5 V (ECU Voltage)
Black/White (+) - Green (-)	0.4 - 1.4 V

If this test is to be repeated the ignition switch must be turned OFF to reset the system.

Fuel Injector

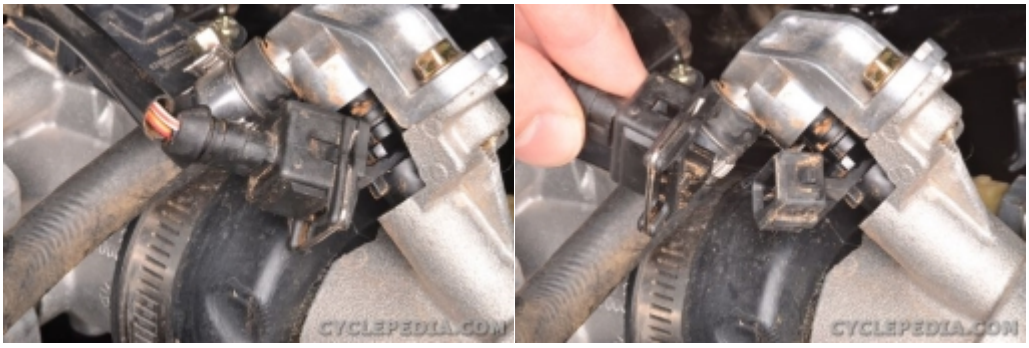
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Gas is extremely flammable! Do not work around an open flame or a source of sparks.

Removal

Remove these components	
Component	Topic
Seat	Seat
Side covers	Side Covers
Fuel tank and shield	Fuel Tank

Loosen the fuel injector hose clamp with a #2 Phillips screwdriver. Disconnect the fuel hose from the fuel injector.



Push in the spring clip and unplug the fuel injector connector.

Disassembly

MXU500i

Remove the two fuel injector mounting bolts with a 10 mm socket.

Remove the fuel injector and pipe from the intake pipe.

Slide off the clip and pull the fuel injector out of its pipe.

The O-rings should be replaced with new items on installation.

MXU700i

On the MXU 700i models remove the single bolt with an 8 mm socket.

Remove the fuel injector and pipe from the intake pipe.

Slide off the clip and pull the fuel injector out of its pipe.

The O-rings should be replaced with new items on installation.

Inspection

A digital multimeter is needed to test the fuel injector.

Set the multimeter to read ohms of resistance (Ω).

Measure the resistance between the fuel injector terminals

ITEM	SPECIFICATIONS
Fuel injector resistance (at 20°C/68°F)	10.6 - 15.9 Ω

Cleaning

PROBLEM

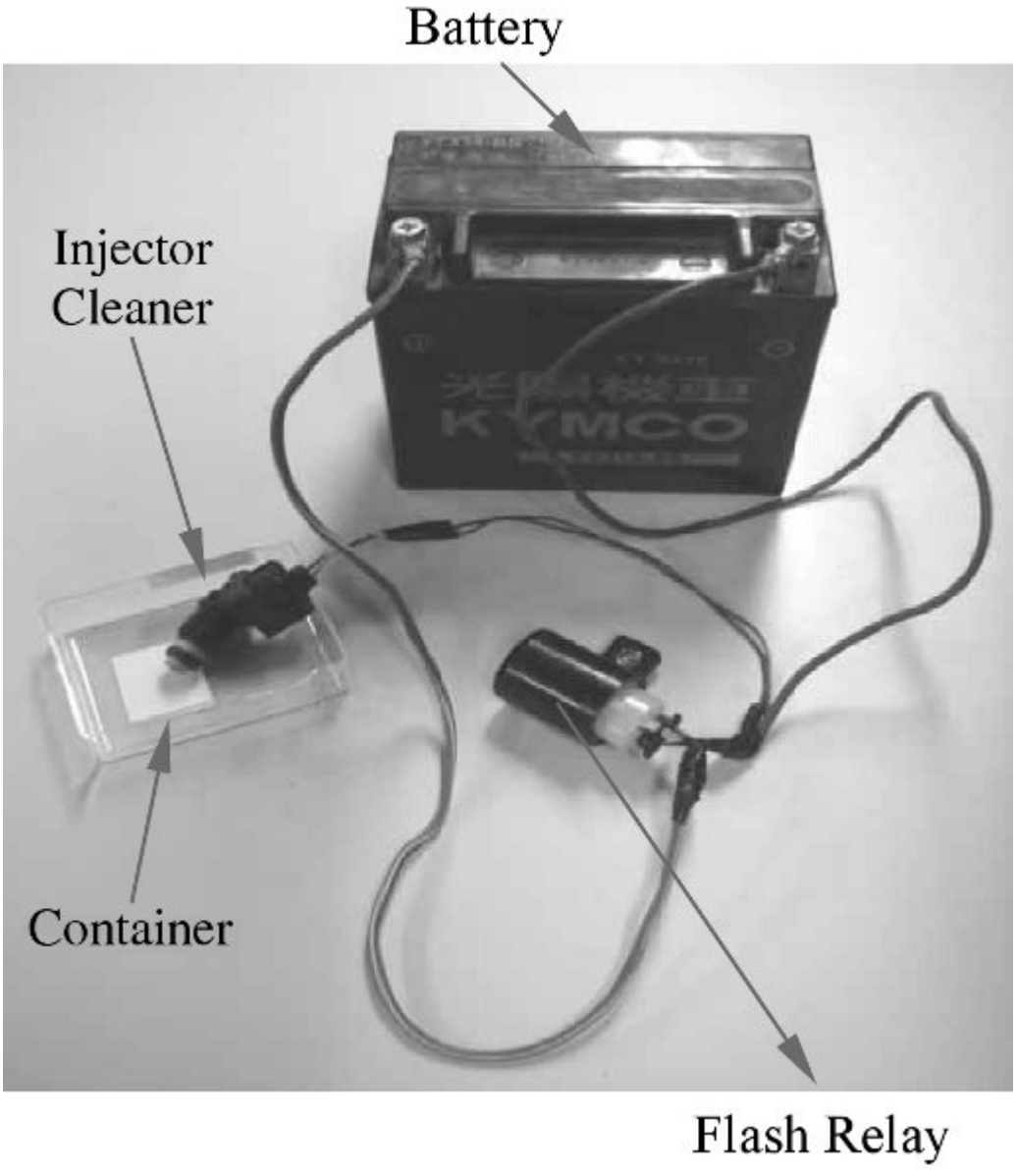
1. Fuel Injector cannot output the fuel.
2. The Injector injection time (ms) is shorter or longer.
Standard: < 1.6 ms. Check this with the FI Tool DATA Analyze page 04. See the Diagnostic Tool topic for more information.

ANALYSIS

Injector block (With carbon build up).

SOLUTION

1. Use the specified injector cleaner.
2. Connect the battery as pictured.
3. The injector cleaner with the flash relay.
4. Keeping the fuel injector operating.
5. Wait for 20-30 minutes.
6. Clean the carbons completely from the injector.



Assembly

MXU500i

Install new O-rings to the fuel injector. Apply a light coat of fresh engine oil to the fuel injector O-ring seals.

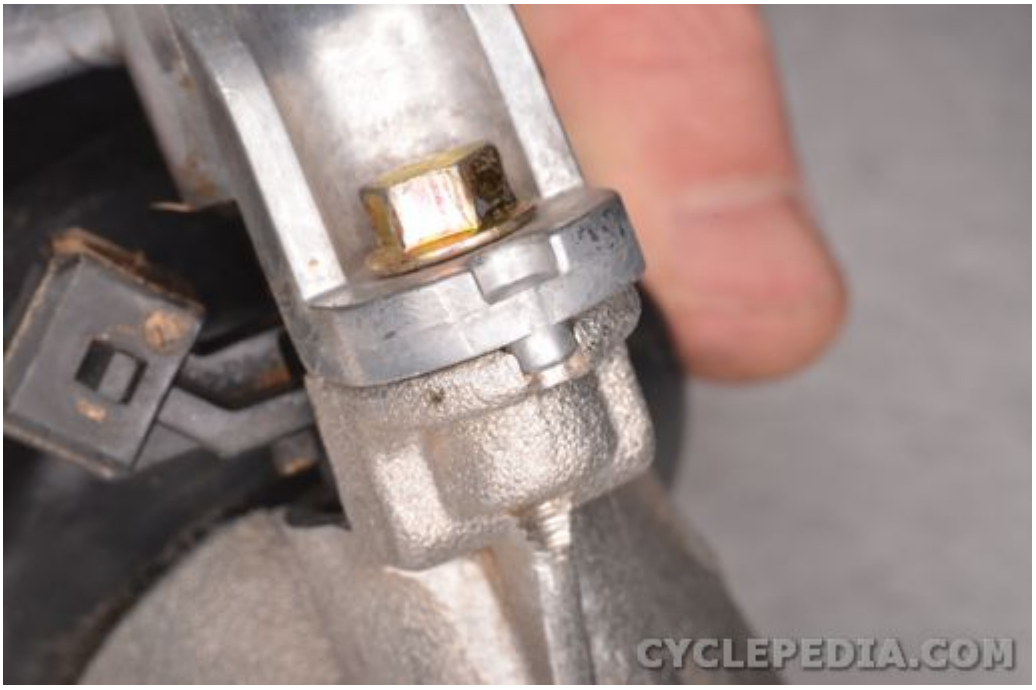
Install the fuel injector into the pipe. Install the clip to secure the fuel injector.

Install fuel injector and pipe onto the intake pipe. Guide the fuel injector into place, and be sure not to damage the O-ring.

Install the two fuel injector mounting bolts and tighten them securely.

Install the fuel injector into the pipe. Install the clip to secure the fuel injector.

Install fuel injector and pipe onto the intake pipe. Guide the fuel injector into place, and be sure not to damage the O-ring.



Fit the post on the fuel pipe into the slot on the intake manifold. Install the bolt and tighten it securely with an 8 mm socket.

Installation

Plug in the fuel injector connector.

Connect the fuel hose to the fuel injector pipe. Tighten the fuel hose clamp securely with a #2 Phillips screwdriver.

Install these components	
Component	Topic
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Seat	Seat

Fuel Pump

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Gas is extremely flammable! Do not work around an open flame or a source of sparks.

Fuel Line Inspection

Remove the seat. See the Seat topic for more information.

Remove fuel tank cover. See the Fuel Tank topic for more information.

Inspect the fuel line from the fuel pump to the throttle body.

Input Voltage Inspection

Unplug the fuel pump connecter.

Set the multimeter to read voltage (DCV).

Touch the multimeter leads to the harness side of the fuel pump connector, with the positive lead touching the orange/red wire terminal and the negative lead touching the green wire terminal.

Turn the ignition switch ON. The battery voltage should show for a few seconds. Replace the fuel pump if it is not functioning and the input voltage is correct.

If the battery voltage is not present check the following:

- Fuse B (10 A)
- Fuel pump relay
- ECU

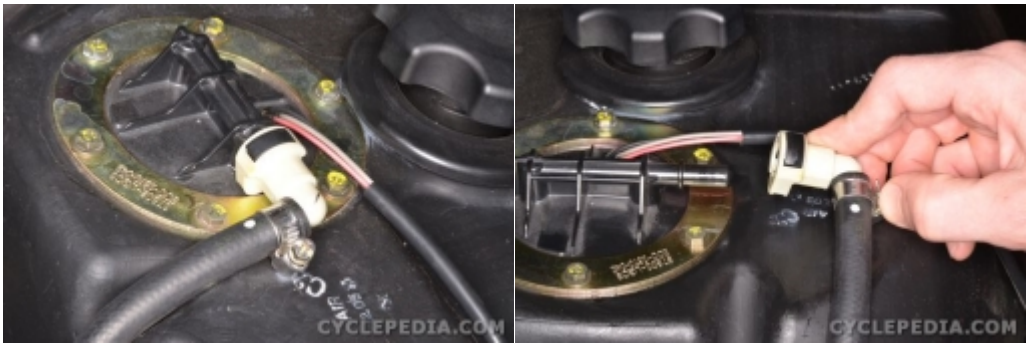
Removal

Turn the ignition switch off.

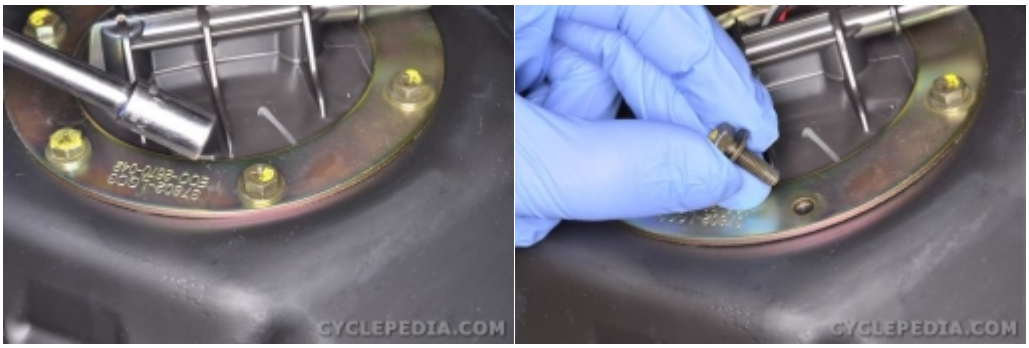
Remove fuel tank cover. See the Fuel Tank topic for more information.

Unplug the fuel pump electrical connecter.

With the fuel pump connector still unplugged start the engine and allow it to run until it uses the remaining fuel in the line and stalls. Turn off the ignition switch after the engine stalls.



Clean the disconnect fitting and put a rag over it. Push down on the black release and disconnect the fuel fitting from the fuel tank. Place plastic bags over the fuel line ends to keep debris out and prevent damage.



Remove the six fuel pump bolts with a 10 mm socket.

Remove the fuel pump mounting ring.

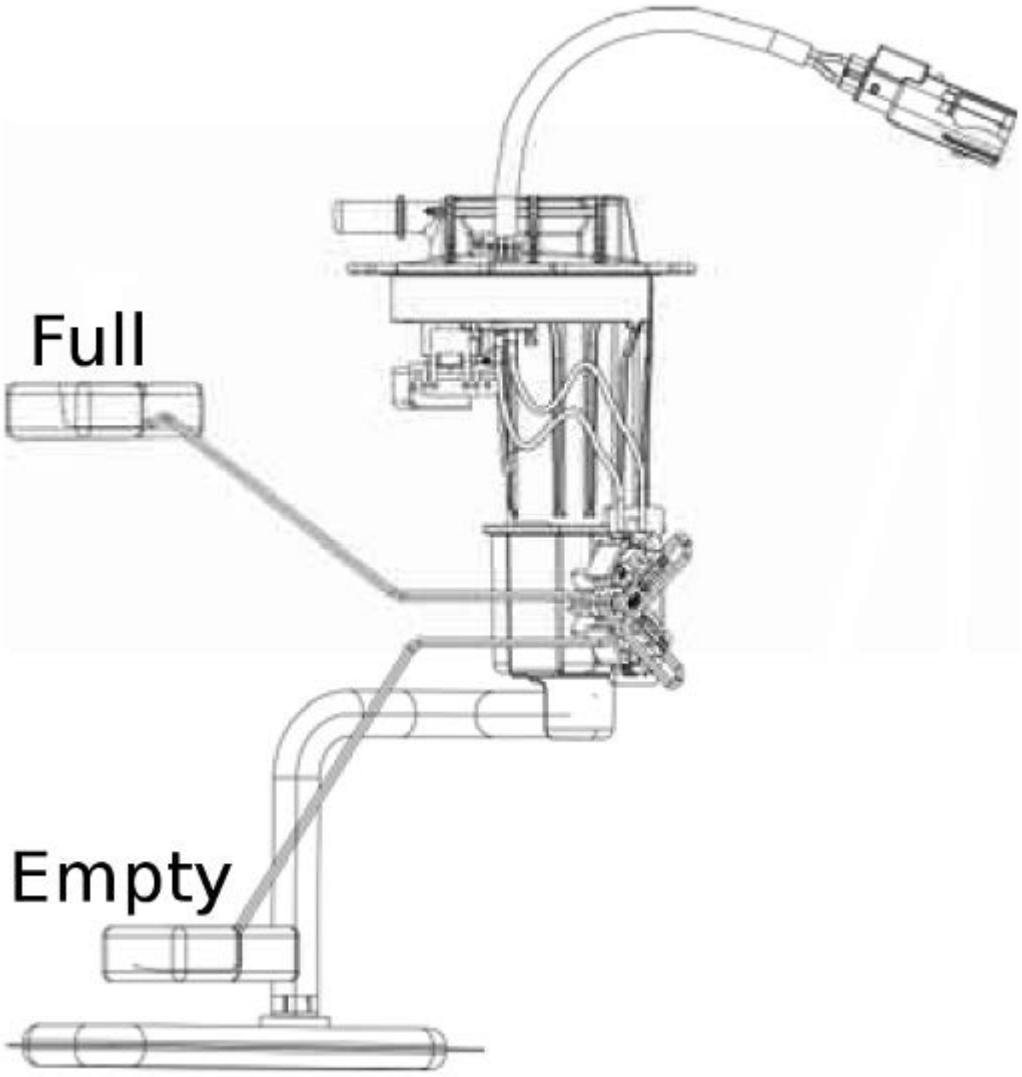
Note the position of the fuel pump outlet pipe. Mark the fuel tank with the outlet pipe position so the fuel pump can be installed to the correct position.

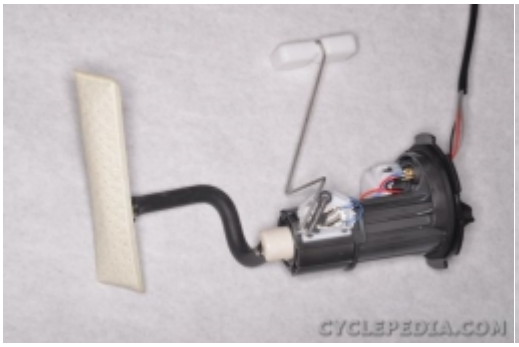
Carefully lift out the fuel pump. Guide the fuel level float out of the fuel tank with the pump.

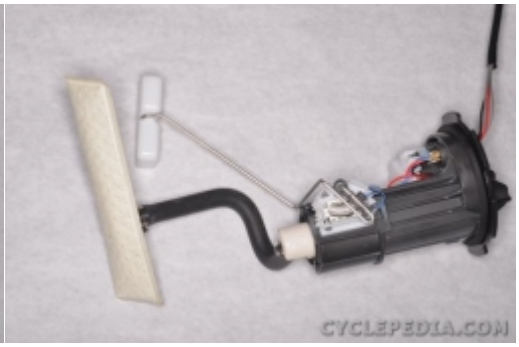
Remove the O-ring from the fuel pump. Discard the fuel pump O-ring, and replace it with a new item on assembly.

Inspect the fuel filter and replace it as needed.

Fuel Level Gauge Inspection







Make sure the fuel level gauge float arm moves smoothly. Using a digital multimeter set to ohms of resistance (Ω). Measure the resistance between the gray wire fuel pump/level gauge connector terminals with the float raised to the positions indicted below.

Fuel Level Float Position	Approximate Resistance
Full	101 Ω
Empty	3 Ω

Replace the fuel pump unit with a new part if the resistance is out of specification.

Fuel Output Pressure

Turn the key to the OFF position.

Use a fuel hose clamp to block the flow of fuel to the fuel injector.

Loosen the fuel injector hose clamp with a #2 Phillips screwdriver.

Disconnect the fuel hose from the fuel injector pipe. Connect the fuel pressure gauge to the fuel hose. Remove the fuel hose clamp. Turn the key to the ON position. Check the fuel pressure.

ITEM	SPECIFICATION
Fuel pump standard pressure	3 Bar or 43 psi

If the fuel pressure is below specification check the fuel line for kinks and clogs. Also, inspect the fuel strainer screen on the fuel pump and the breather hose on the tank.

Fuel Pump Relay

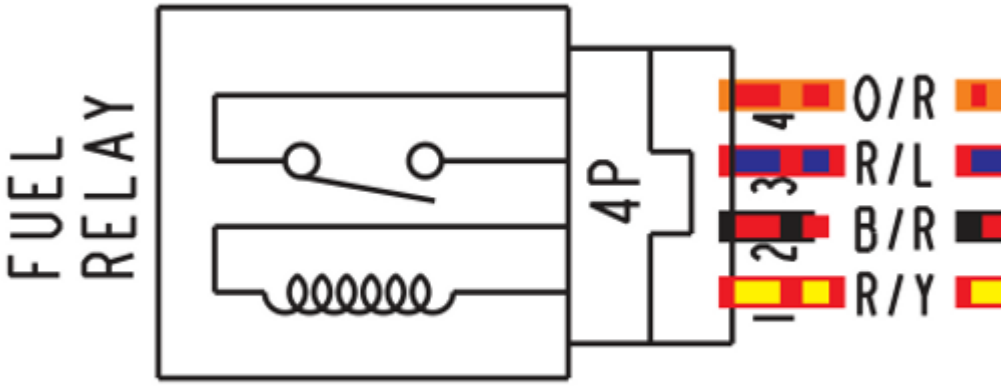
Turn the ignition switch to the OFF position.

Remove the seat. See the Seat topic for more information.

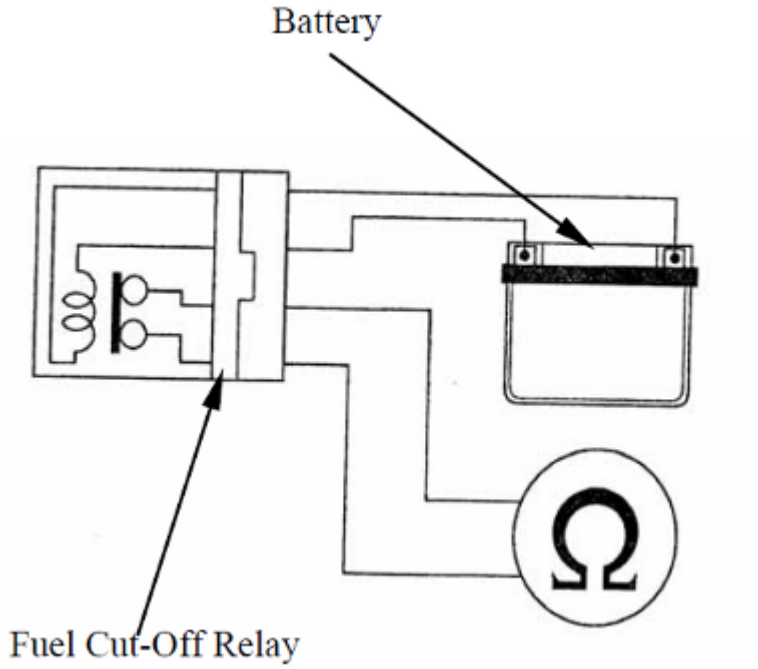
The fuel pump relay is located under the seat.

Continuity Test

Set the multimeter to read ohms of resistance (Ω).



Check for continuity between the terminals of the relay that match up with the red/blue and orange/red wires.



Jump a 12 V battery to the terminals of the relay that match up with red/yellow and black/red wires.

There should be continuity only when 12 V battery connected. If there is not continuity when the 12 V battery is connected, replace the fuel pump relay.

Installation

Replace the O-ring with new item and apply a small amount of fresh engine oil to the new O-ring.

Carefully insert the fuel pump into the tank. Avoid damaging the fuel pump wires and fuel strainer.

Position the fuel delivery pipe as shown.

Install the fuel pump mounting ring.

Install the six fuel pump bolts. Tighten the bolts evenly and securely with a 10 mm socket.

Connect the fuel hose to the outlet pipe on the fuel pump. Make sure the connector is securely attached to the outlet pipe.

Plug in the fuel pump connecter.

fuel tank cover. See the Fuel Tank topic for more information.

Install the seat. See the Seat topic for more information.

Throttle Body Removal and Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

- Turn off the ignition switch during removal/installation.
- Check and confirm if the voltage is over 12V with a voltmeter after replacement.
- Check and confirm if the other connectors are installed correctly after replacement.
- Do not damage the throttle body, it may cause the throttle and idle valve to fail synchronization.
- The throttle body is preset in the KYMCO factory, do not disassemble it incorrectly.
- Do not loosen or tighten the painted bolts and screws for the throttle body. Loosening or tightening them can cause the throttle and idle valve synchronization to fail.
- TPS and ISC have to be reset after the throttle body MAP, TPS, ISC or ECU has been reinstalled.

Removal

Throttle Body

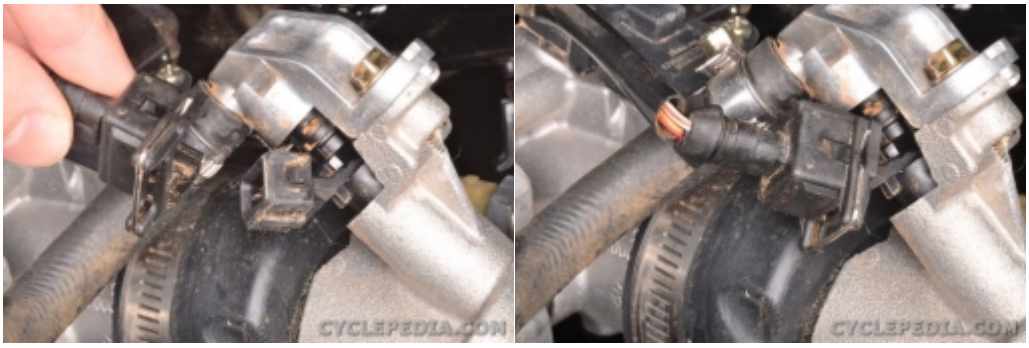
Remove these components	
Component	Topic
Seat	Seat
Side covers	Side Covers
Fuel tank and shield	Fuel Tank
Rear Fender	Rear Fender
Airbox	Airbox

Unplug the ISC connector.

Unplug the TPS connector.

Unplug the T-MAP connector.

Loosen the fuel injector hose clamp with a #2 Phillips screwdriver. Disconnect the fuel hose from the fuel injector.



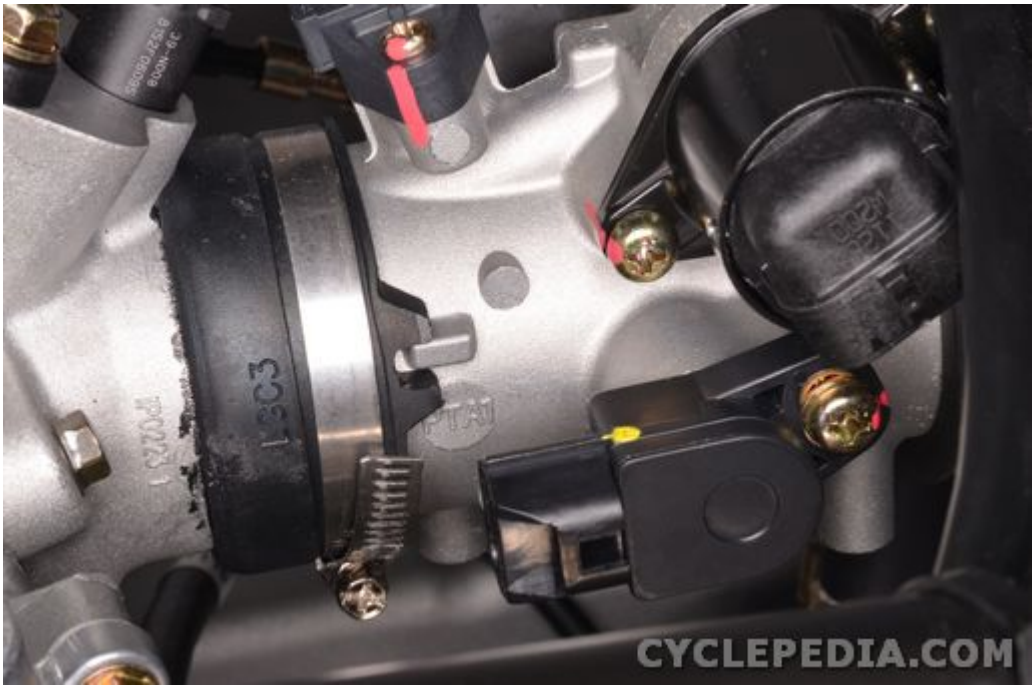
Push in the spring and unplug the fuel injector connector.

Remove the two throttle drum cover screws with a #2 Phillips screwdriver.

Remove the throttle drum cover.

Slide the throttle cable housing out of the throttle body.

Free the throttle cable from the throttle drum.



The throttle body is held to the intake pipe with a clamp.

Loosen the intake pipe clamp with a #2 Phillips screwdriver.

Remove the throttle body from the intake pipe.

Intake Pipe

Remove the two intake pipe bolts that hold the intake pipe to the cylinder head.

Remove the intake pipe from the cylinder head.

Remove the O-ring from the intake

To remove the fuel injector see the Fuel Injector topic for more information.

To disassemble the throttle body see the Throttle Body Components topic for more information.

Installation

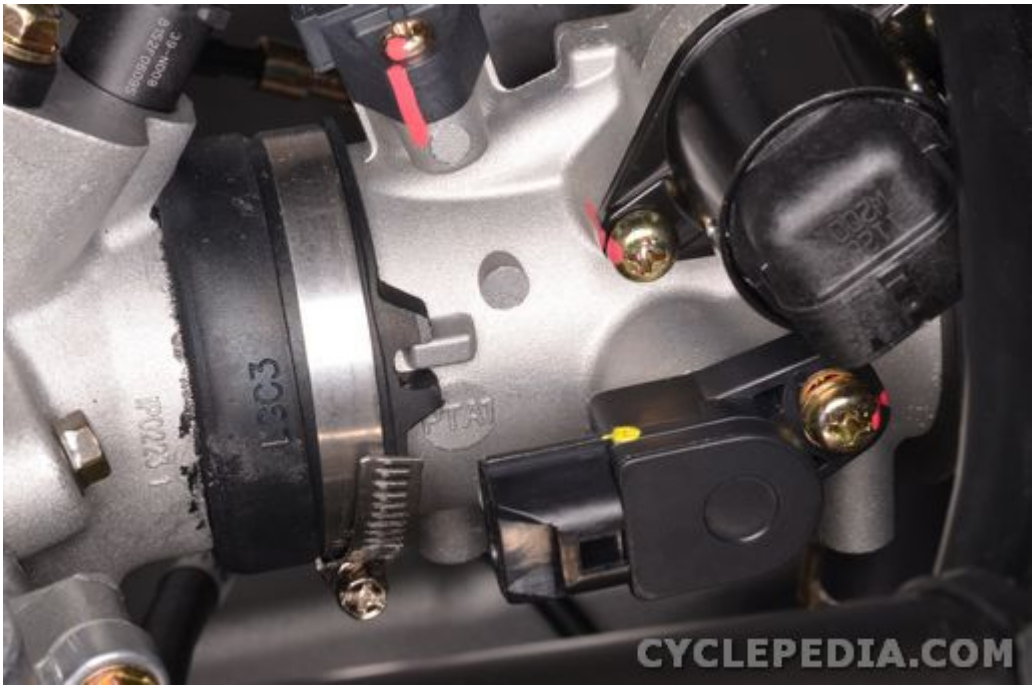
Intake Pipe

Install a new intake pipe O-ring. If this O-ring allows an air leak the engine will not run correctly.

Fit the intake pipe onto the cylinder head.

Install the intake pipe and tighten the bolts securely with a 10 mm socket.

Throttle Body



Fit the throttle body into place as shown. Make sure the ridge on the throttle body fits into the gap on the intake pipe fitting.

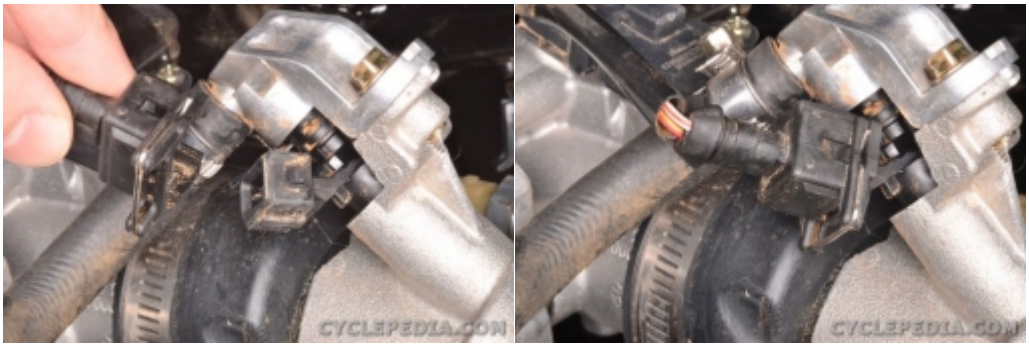
Tighten the intake pipe throttle body clamp securely with a #2 Phillips screwdriver.

Fit the end of the throttle cable into the throttle drum.

Fit the throttle cable into the throttle body as shown.

Install the throttle drum cover.

Install the two throttle drum cover screws and tighten them securely with a #2 Phillips screwdriver.



Plug in the fuel injector connector.

Connect the fuel hose to the fuel injector pipe. Tighten the fuel hose clamp securely with a #2 Phillips screwdriver.

Plug in the T-MAP connector.

Plug in the TPS connector.

Plug in the ISC connector.

Install these components	
Component	Topic
Airbox	Airbox
Rear Fender	Rear Fender
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Seat	Seat

Throttle Body Components

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

To remove the throttle body. See the Throttle Body Removal and Installation topic for more information.

To inspect the sensors see the Fuel Injection Sensors topic.

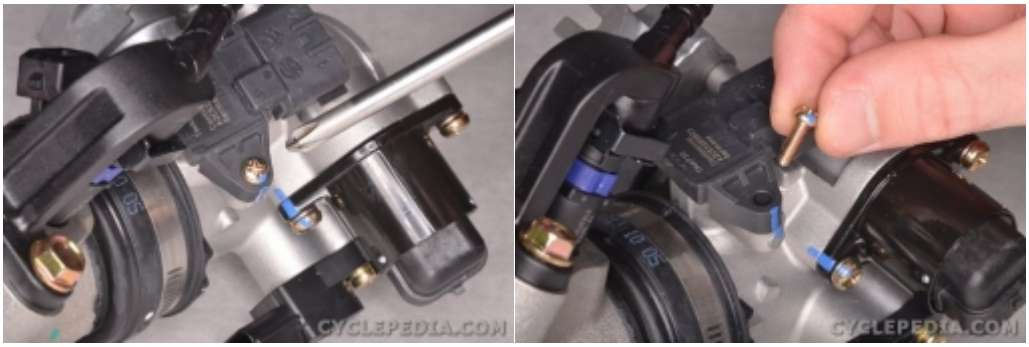
Disassembly

Fuel Injector

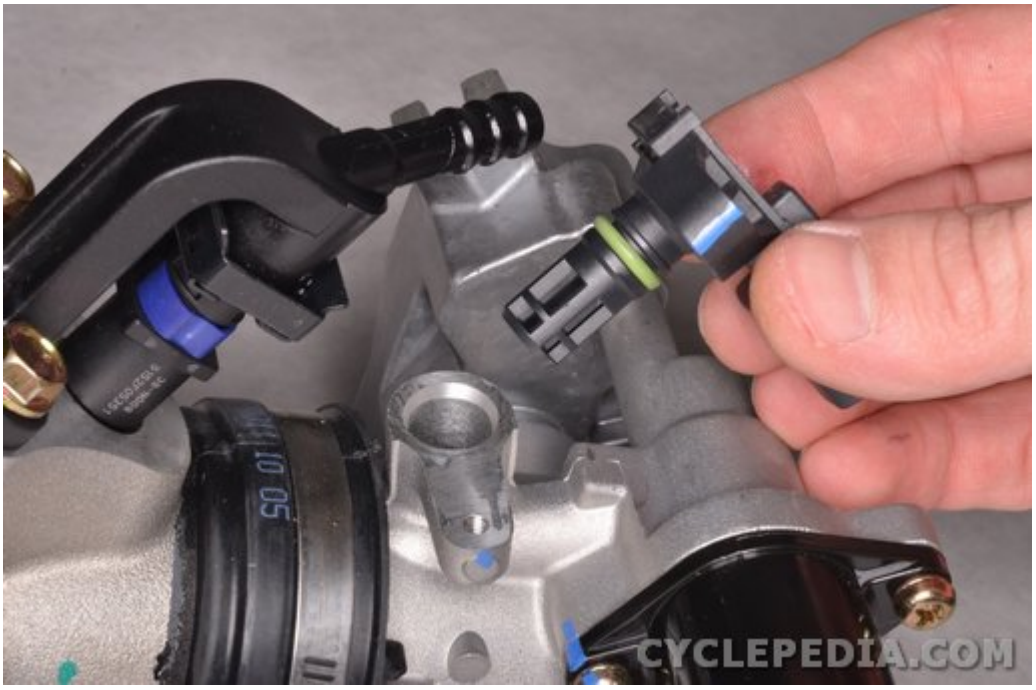
To remove the fuel injector see the Fuel Injector topic.

T-MAP Sensor

The T-MAP sensor sits on top of the throttle body.



Remove the T-MAP sensor set plate screw with a #2 Phillips screwdriver.



Remove the T-MAP sensor.

ISC (Idle Speed Control - Air Bypass Valve)

Remove the two ISC screws with a #2 Phillips screwdriver.

Remove the ISC from the throttle body.

Remove the O-ring from the ISC and discard it. Clean the tip of the ISC valve.

Inspection

If the engine is hard to start, stops, or idles rough the ISC may be faulty.

Use the data analysis feature of the FI Diagnostic Tool to see information on the ISC. See the Diagnostic Tool topic for more information.

Start the engine and let it run until the engine temperature reaches 80° C.

The ISC step should be below 65.

TPS Sensor

The TPS is located on the throttle shaft opposite the throttle drum.

Remove the TPS sensor with a #2 Phillips screwdriver.

Assembly

The throttle position sensor (TPS) and idle air bypass valve (ISC) have to be reset when the throttle body MAP, TPS, ISC or ECU have been reinstalled.

TPS/ISC Reset

Start the engine and let it idle until the engine temperature has reached 85° C (185° F). The ECU will learn the new setting.

TPS Sensor

Apply oil onto a new O-ring and place it on the TPS.

Install the TPS onto the throttle body so that it returns to the original position.

Install and tighten the screw securely with a #2 Phillips screwdriver.

ISC (Idle Speed Control - Air Bypass Valve)

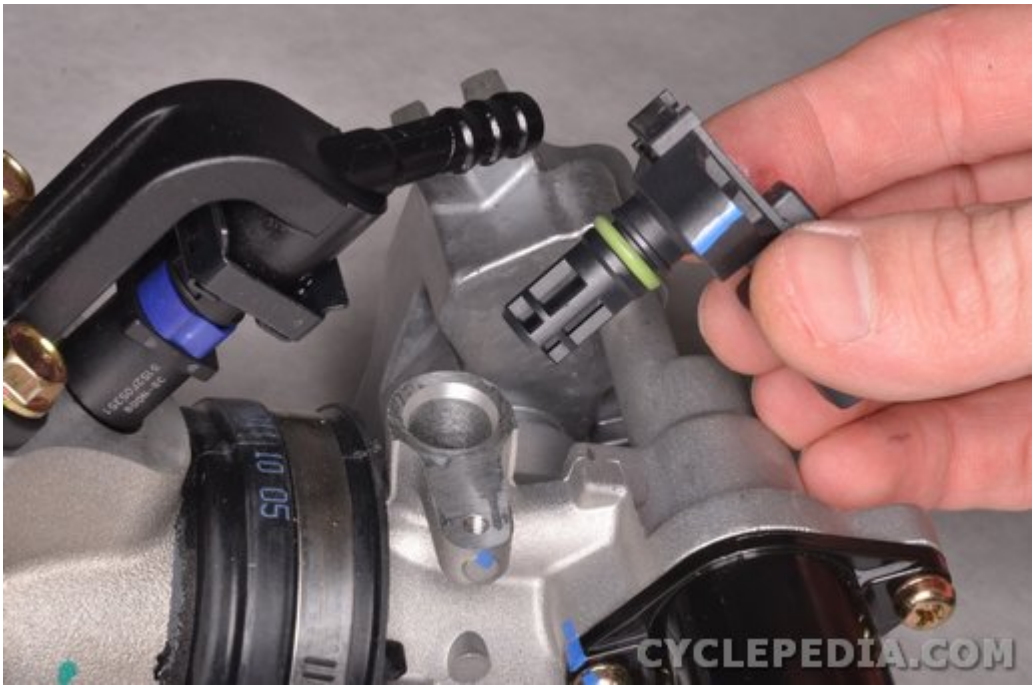
Apply oil onto a new O-ring and place it on the ISC.

Install the ISC into the throttle body as shown, being careful not to damage the O-ring.

Install the two ISC screws and tighten them securely with a #2 Phillips.

T-MAP Sensor

Apply oil onto a new O-ring and place it on the T-MAP sensor.



Install the T-MAP into the throttle body, being careful not to damage the O-ring.

Install the T-MAP sensor screw and tighten it securely with a #2 Phillips.

Install the throttle body. See the Throttle Body Removal and Installation topic for more information.

4.External Components

This chapter covers the location and servicing of the external components for the KYMCO MXU 700i.

1.Drive Selector 4-5
2.Exhaust System 4-14
3.Front Bumper 4-24
4.Front Cover 4-29
5.Front Fender 4-33
6.Fuel Tank 4-45
7.Instrument Cover 4-63
8.Mudguards and Footrests 4-72
9.Lights 4-77
10.Racks 4-85
11.Rear Fender 4-98
12.Seat 4-108
13.Side Covers 4-112
14.Skid Plate 4-116

GENERAL INSTRUCTIONS

• When removing frame covers, use special care not to pull them by force because the cover joint claws may be damaged.
• Make sure to route cables and harnesses according to the Cable & Harness Routing.

TROUBLESHOOTING

Noisy exhaust muffler

• Damaged exhaust muffler
• Exhaust muffler joint air leaks

Lack of power

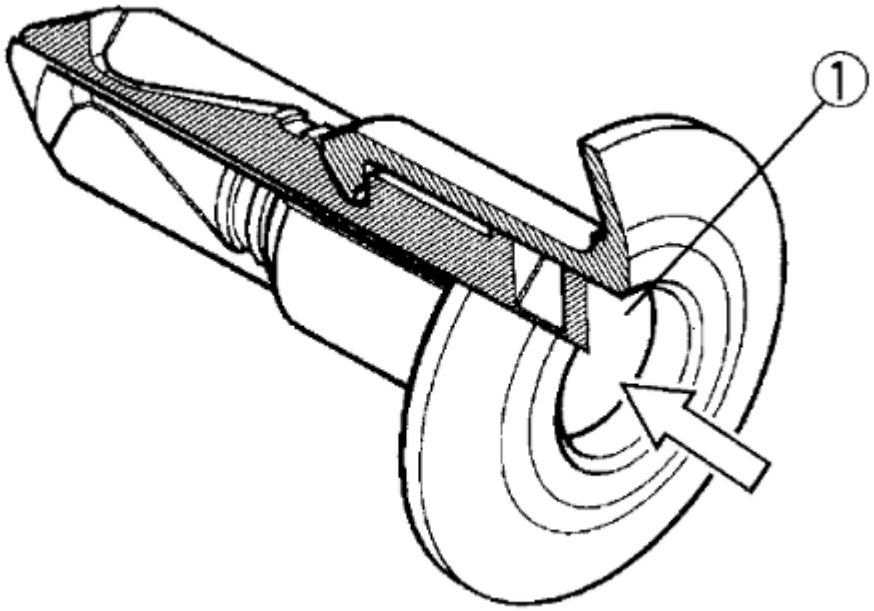
• Caved exhaust muffler
• Exhaust muffler air leaks
• Clogged exhaust muffler

Trim Clips

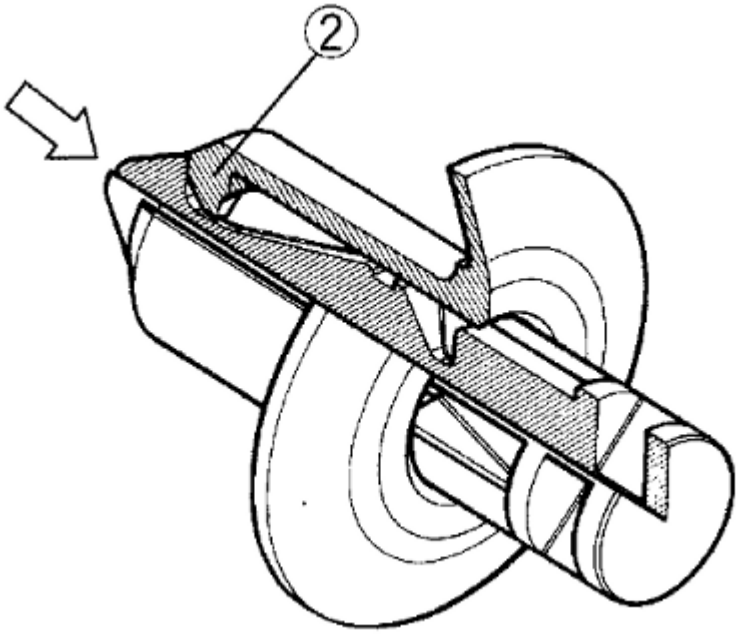
Screw Type

Back the screw out with a Phillips screwdriver to unlock the screw type trim clips. Install the trim clip and then turn in the screw to lock the clip in place.

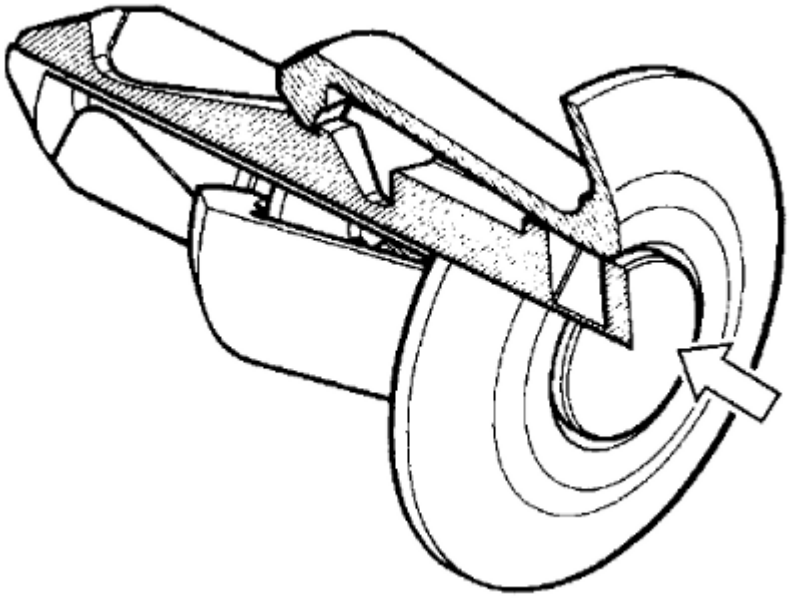
Button Type



Depress the head of trim clip center piece (1). Pull out the trim clips.



Let the center piece stick out toward the head so that the pawls (2) close. Insert the trim clip into the installation hole. To prevent the pawl (2) from damage, insert the fastener all the way into the installation hole.



Push in the head of center piece until it becomes flush with the trim clip outside face.

Drive Mode Selector

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

With the engine stopped and the brake lever lock engaged, turn the ignition switch to the ON position: then shift the transmission into each of the gear positions and note that the gear position indicated on the LCD corresponds to the gear position selected by the lever.

If the indicator does not correspond to the selected gear, it will be necessary to test drive the ATV to determine if the gear shift position switch is faulty or the shift linkage needs adjustment. If the ATV functions in the gear selected by the shift lever, troubleshoot the gear shift position switch. See the Switches topic for information on testing the switch.

If the ATV doesn't shift as it should adjust the shift linkage.

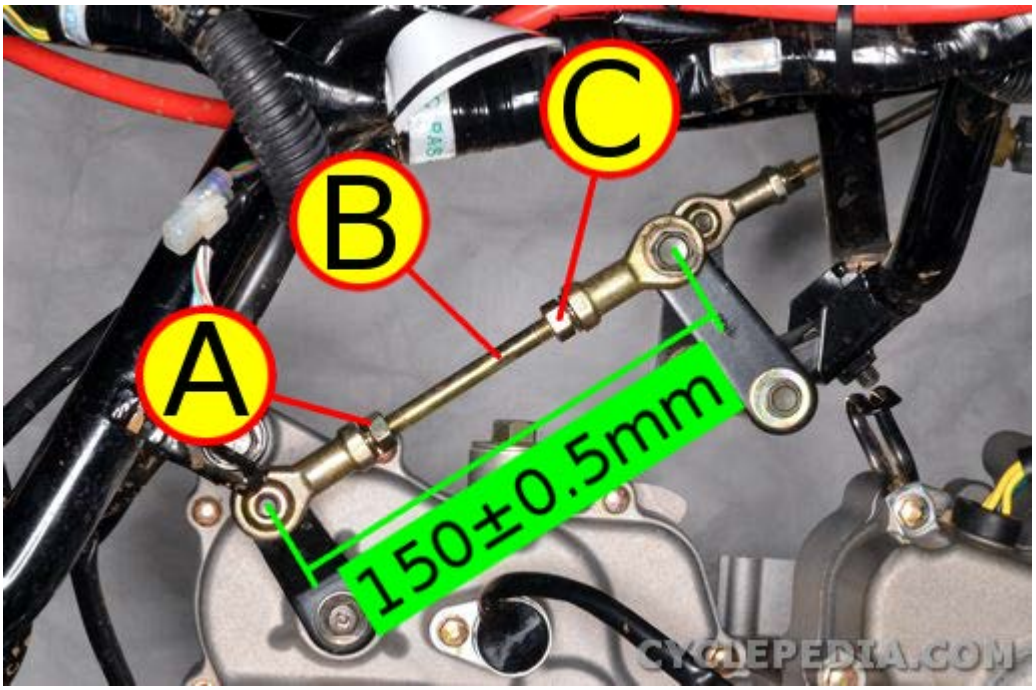
Adjustment

Have the ignition switch in the OFF position. Set the transmission in neutral.

Remove the side covers. See the Mudguards and Footrests topic for more information.

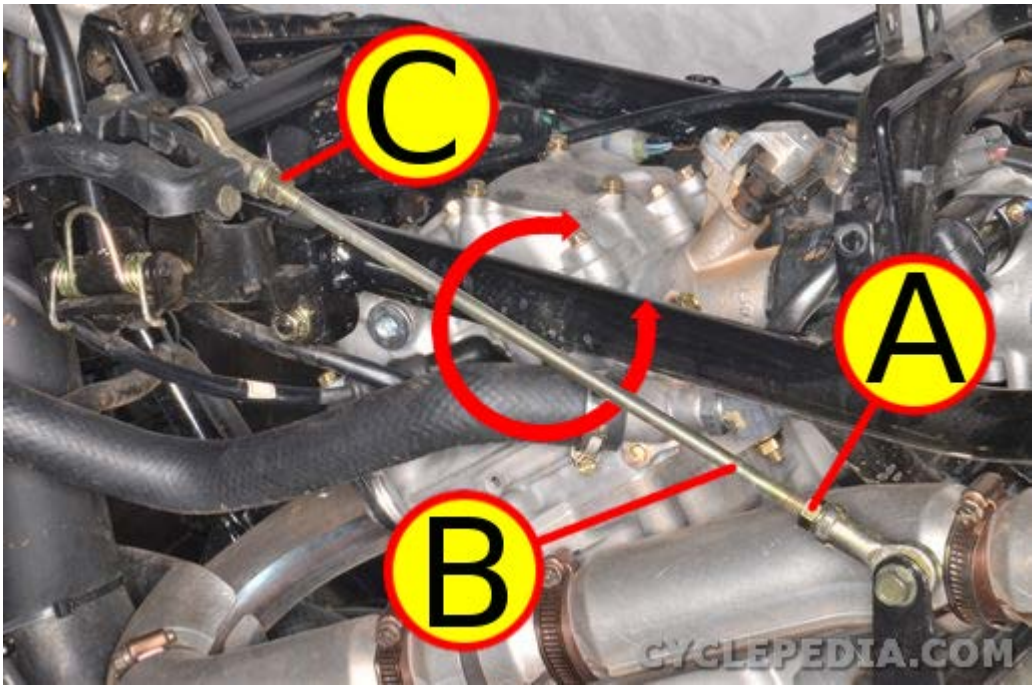
Remove the fuel tank cover. See the Fuel Tank topic for more information.

Note: The MXU 500 models only have one large linkage shaft.



Inspect the short drive selector linkage shaft on the right side. Measure its length from the center of the joints as shown. If the length is out of specifications loosen the reverse thread lock nut (A), the upper lock nut (C), and turn the adjuster shaft (B) until the length is correct. Tighten the lock nuts securely.

Turn on the ignition switch, but do not start the engine. Position the transmission in neutral. The neutral light should illuminate on the display.



Loosen the reverse thread lock nut (A), the upper lock nut (C), and turn the adjuster shaft (B) in or out as needed until the shift lever rests correctly in the neutral position. Make sure the shift lever functions correctly in each position. Tighten the lock nuts securely when finished.

If the internal gearshift mechanism needs to be inspected see the Transmission Removal topic.

Removal

Knob

Remove the gearshift knob trim clip and the gearshift knob.

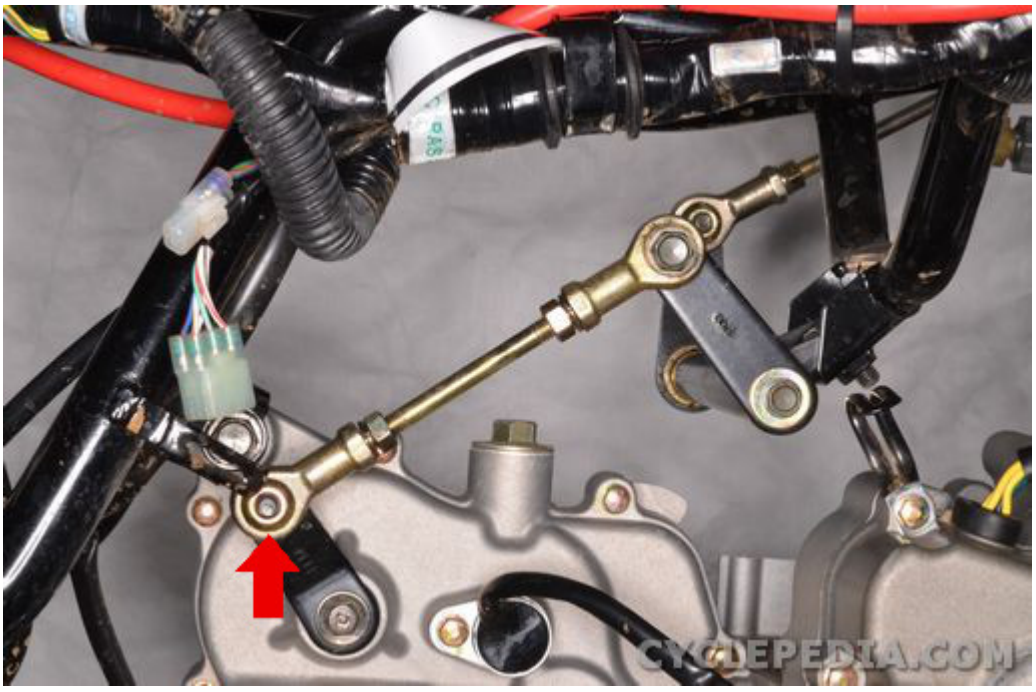
Shift Mechanism

Remove the seat. See the Seat topic for more information.

Remove the side covers. See the Side Covers topic for more information.

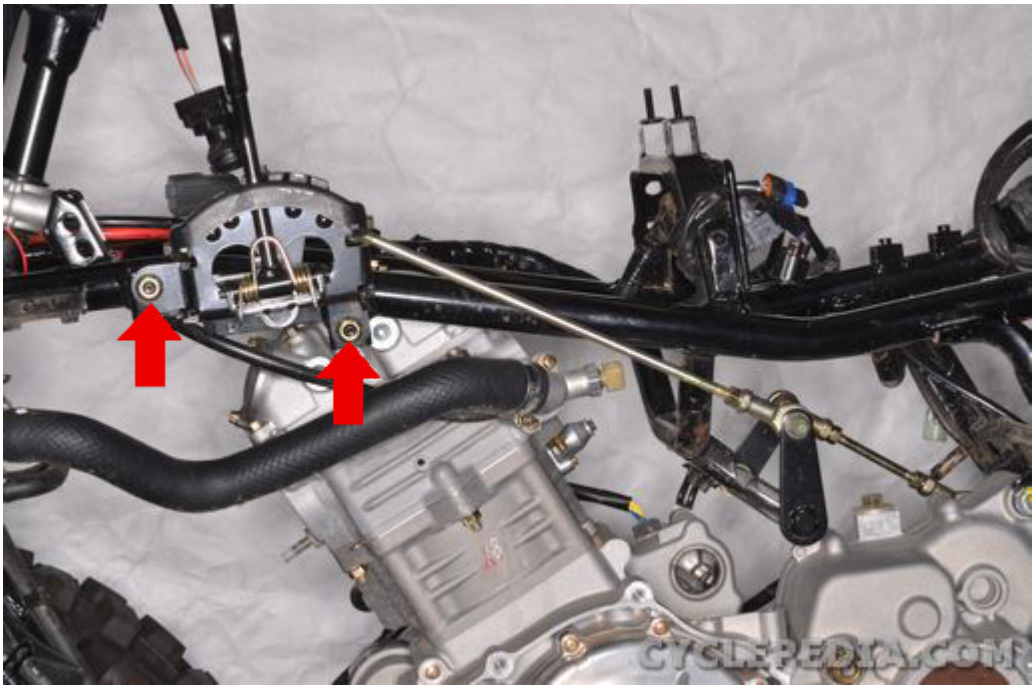
Remove the front cover. See the Front Cover topic for more information.

Remove the fuel tank. See the Fuel Tank topic for more information.



Remove the nut from the engine side of the linkage.

Remove the two linkage pivot mounting bolts.

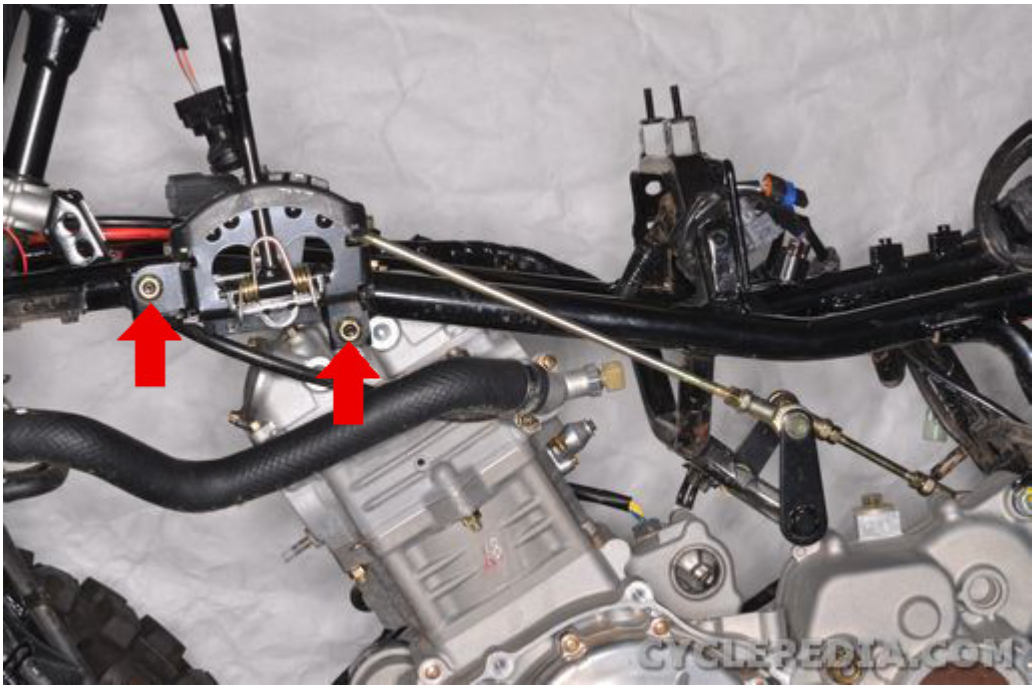


Remove the two drive selector lever mounting nuts.

Free the drive selector lever assembly from the frame and the lower end of the shift linkage from the shift arm on the engine.

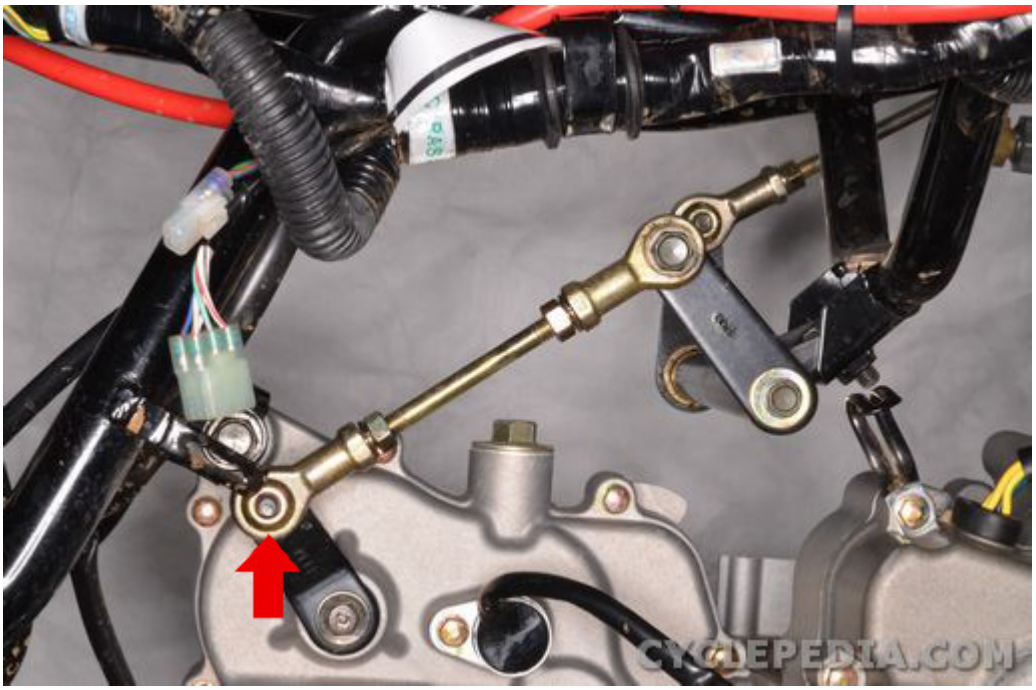
Installation

Shift Mechanism



Fit the drive selector lever assembly into place on the right side of the frame. Connect the bottom end of the linkage to the shift arm on the engine. Install the two drive selector lever assembly mounting nuts and tighten them securely.

Install the two linkage pivot bolts and tighten them securely.



Thread on the bottom linkage nut and tighten it securely.

Adjust the linkage so the lever position and gear position indicator line up correctly.

Install the fuel tank. See the Fuel Tank topic for more information.

Install the front cover. See the Front Cover topic for more information.

Install the side covers. See the Side Covers topic for more information.

Install the seat. See the Seat topic for more information.

Knob

Install the gearshift knob and trim clip.

Exhaust System

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

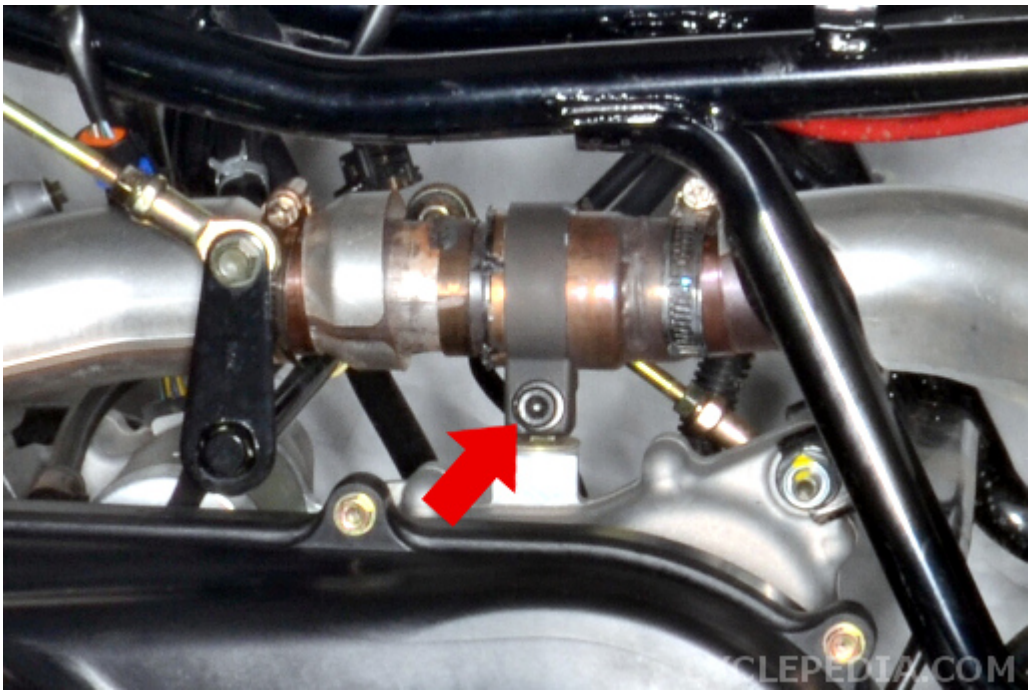
Always allow the exhaust system plenty of time to cool before touching it.

For information on the spark arrestor see the Spark Arrestor topic.

Removal

Muffler

Remove these components	
Component	Topic
Rear rack	Racks
Seat	Seat
Left mudguard	Mudguards and Footrests
Side covers	Side Covers



Loosen the exhaust pipe clamp.

Loosen the two muffler mounting bolts.

Remove the muffler mounting bolts and washers.

Slide the muffler back and free it from the header pipe.

Remove the exhaust pipe gasket and discard it.

Remove the two header pipe nuts

Free the header pipe from the cylinder head and remove the exhaust gasket. Discard the exhaust gasket.

Remove the header pipe.

To remove the heat shields loosen the clamps with a #2 Phillips screwdriver.

Installation

Install a new exhaust gasket into the exhaust port. A small dab of grease will help hold it in place, just be aware that it will smoke and burn off when the engine is started.

Fit the exhaust pipe into place.

Thread on the exhaust pipe joint nuts. Tighten them securely with a 12 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Exhaust pipe and head	8	2.0 (20, 14)

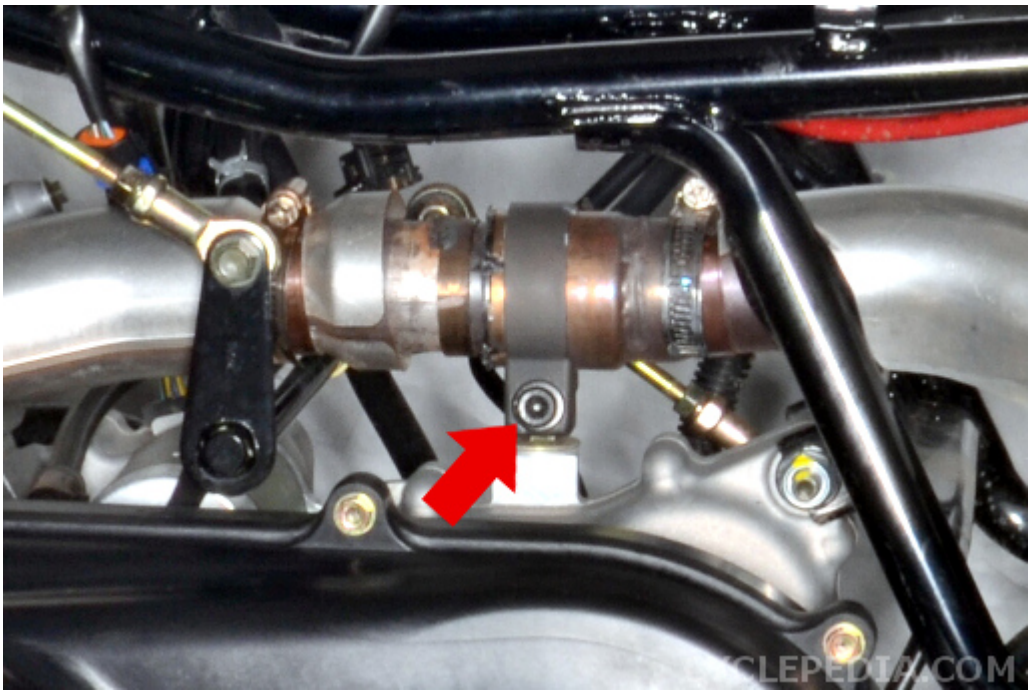
Install a new gasket between the muffler pipe and header pipe.

Fit the muffler pipe into place.

Install the muffler mounting bolts and washers.

Tighten the muffler mounting bolts to specification.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Exhaust muffler mounting bolt	2	8	3.5 (35, 25)



Tighten the exhaust pipe clamp securely.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Exhaust muffler band bolt	1	8	2.1 (21, 15)

Install these components	
Component	Topic
Side covers	Side Covers
Left mudguard	Mudguards and Footrests
Rear rack	Racks
Seat	Seat

Front Bumper

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Front rack	Racks
Seat	Seat
Front cover	Front Cover
Side covers	Side Covers
Fuel tank cover	Fuel Tank
Front mudguard fasteners	Mudguards and Footrests
Front fender	Front Fender

Unplug the roll sensor.

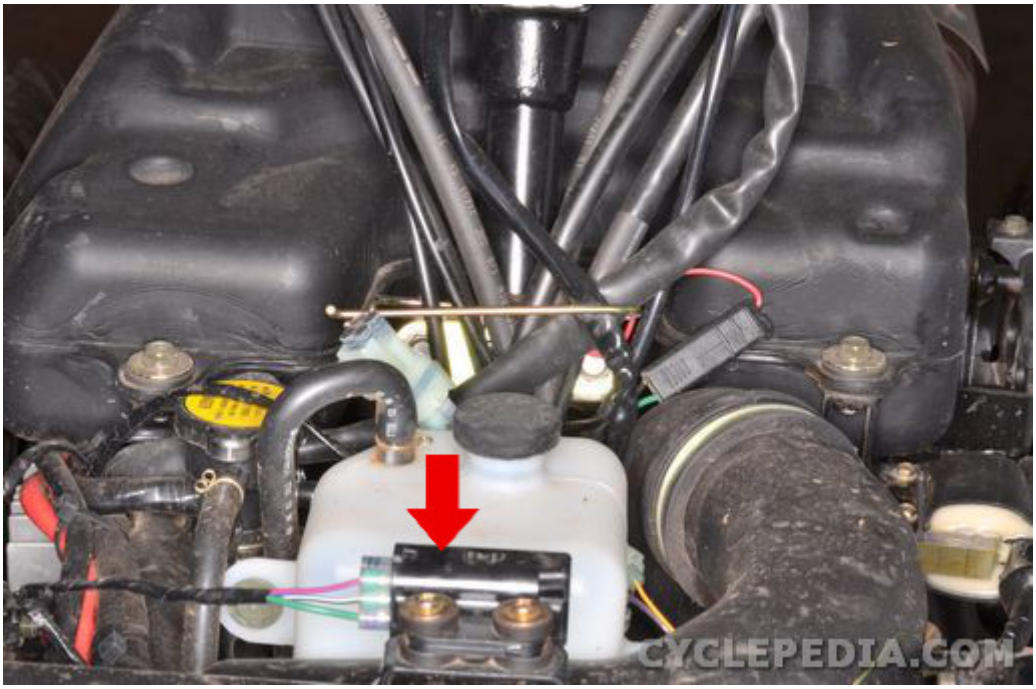
The front fender bracket and front bumper surround the radiator. The front fender bracket is mounted to the frame with two bolts, and the front bumper is mounted to the frame with four bolts.

Remove the six front fender bracket and front bumper bolts. Remove the front fender bracket and the front bumper together from the frame.

Installation

Install the front fender bracket and the front bumper to the frame.

Tighten the bolts securely.



Plug in the roll sensor.

Install these components	
Component	Topic
Front fender	Front Fender
Front mudguard fasteners	Mudguards and Footrests
Fuel tank cover	Fuel Tank
Side covers	Side Covers
Front cover	Front Cover
Seat	Seat
Front rack	Racks

Front Cover

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the two trim clips from the top of the front cover.

Slide the front cover back and free the tabs from the front fender.

Remove the front cover.

Installation

Fit the front cover into place.

Guide the tabs on the front cover into the front fender.

Install the two trim clips into the top of the front cover.

Front Fender

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Front rack	Racks
Seat	Seat
Front cover	Front Cover
Side covers	Side Covers
Fuel tank cover	Fuel Tank
Front mudguard fasteners	Mudguards and Footrests

Unplug the headlight connectors.

Remove the two inner fender trim clips from behind the A-arm mounts.

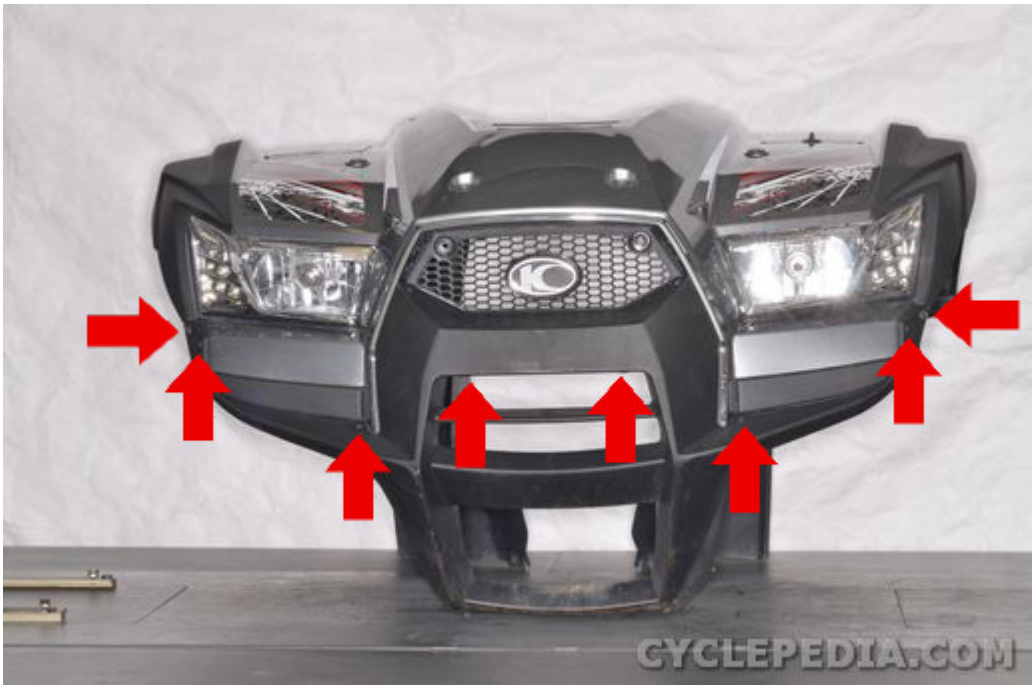
Remove the two front fender bolts from each side with a 10 mm socket.

Remove the two bolts from the grill with a 10 mm socket.

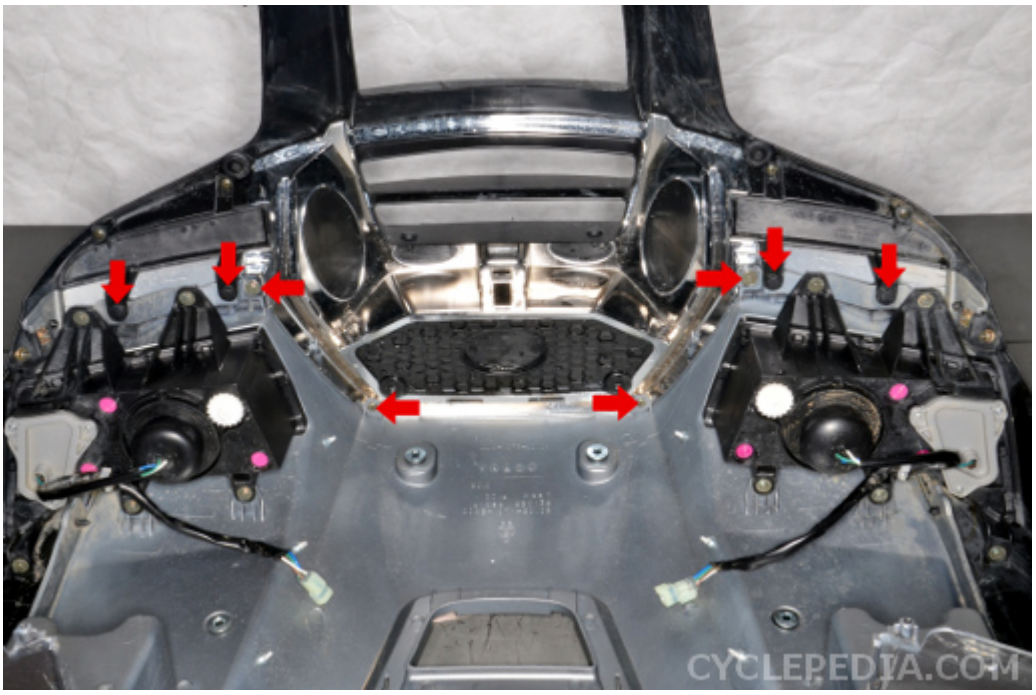
Disconnect the accessory plugs.

Lift off the front fender assembly.

Disassembly

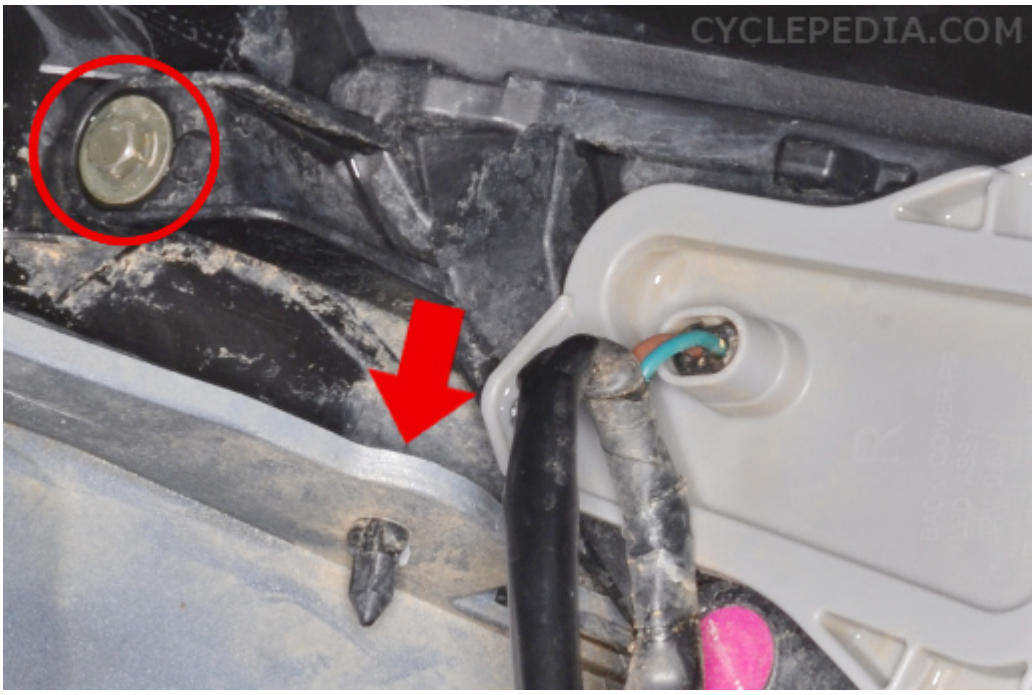


To remove the bumper cover remove the four trim clips. Remove the screws with a #3 Phillips and a 10 mm wrench.



To remove the bumper and grill take out the indicated fasteners.

To remove the inner fender take out the three self-tapping screws on each side.



To remove the fender flares remove the headlight bolt and trim clips.

Assembly

Install the fender flares. Install the trim clips and headlight mounting bolts.

Install the inner fenders. Install the three self-tapping screws with each and tighten them securely with a #2 Phillips screwdriver.

To Install the bumper and install the indicated fasteners.

Installation

Fit the front fender into place.

Connect the accessory plugs.

Install the two grill bolts securely with a 10 mm socket.

Install the two front fender bolts to each side and tighten them securely with a 10 mm socket.

Install the two inner fender trim clips behind the A-arm mounts.

Plug in the headlight connectors.

Install these components	
Component	Topic
Front mudguard fasteners	Mudguards and Footrests
Fuel tank cover	Fuel Tank
Side covers	Side Covers
Front cover	Front Cover
Seat	Seat
Front rack	Racks

Fuel Tank

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Gasoline is extremely flammable. Work in an area that is free of open flames and sources of sparks. Properly clean up any spilled gasoline as soon as possible.

Removal

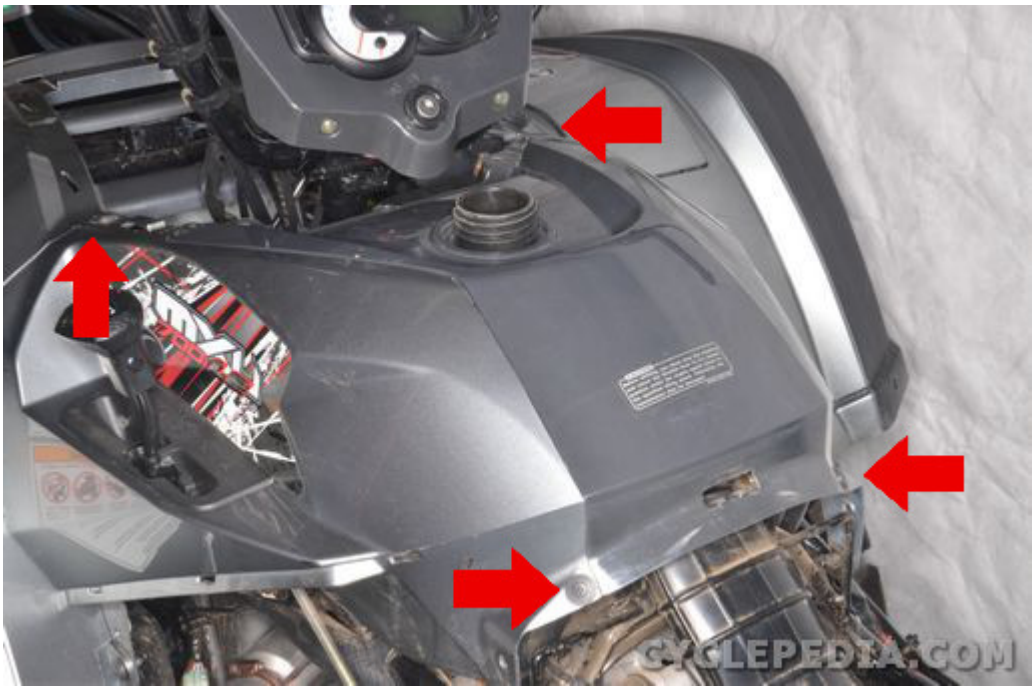
Cover

Remove the seat. See the Seat topic for more information.

Remove the side covers. See the Side Covers topic for more information.

Remove the front cover. See the Front Cover topic for more information.

Temporarily remove the fuel cap.



The fuel tank cover is held on by four trim clips.

Remove the trim clips.

Remove the gearshift knob trim clip and the gearshift knob.

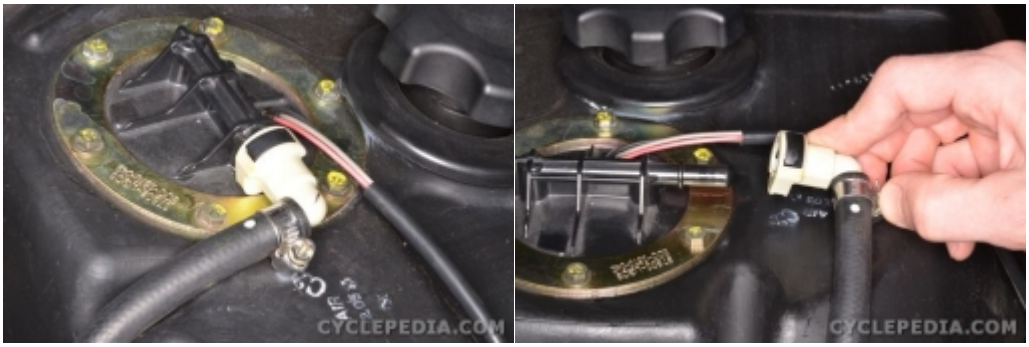
Free the fuel tank cover tabs from the front fender and lift off the fuel tank cover.

To disassemble the fuel tank cover remove the screws with a #2 screwdriver.

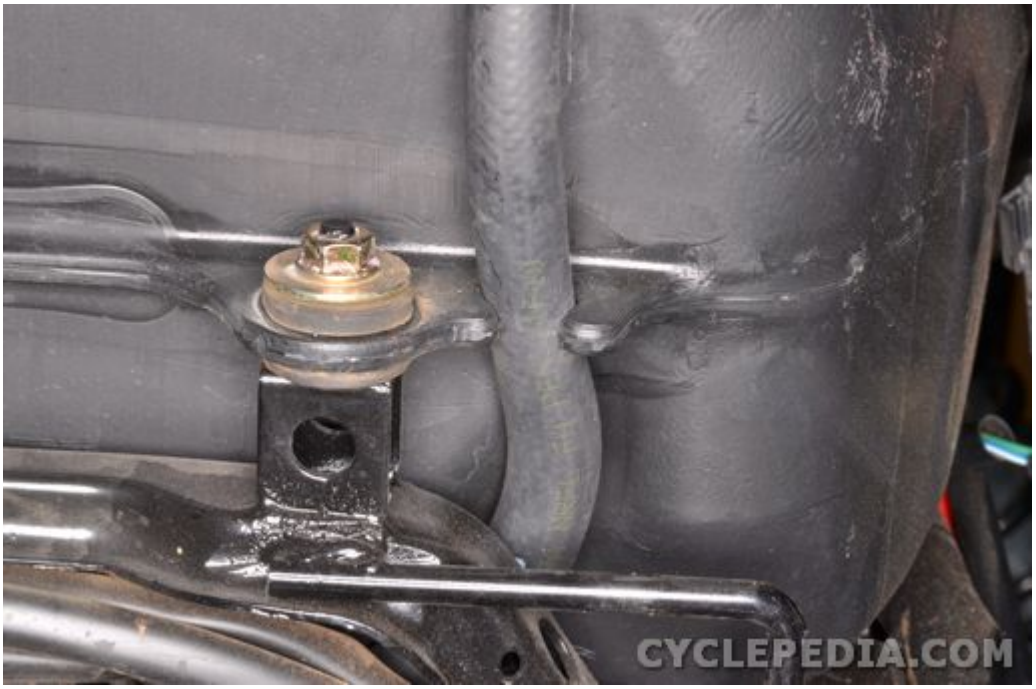
Return the cap to the fuel tank.

Tank

With the fuel pump connector still unplugged start the engine and allow it to run until it uses the remaining fuel in the line and stalls. Turn off the ignition switch after the engine stalls.



Clean the disconnect fitting and put a rag over it. Push down on the black release and disconnect the fuel fitting from the fuel tank. Place a plastic bag over the fuel line end to keep debris out and prevent damage.



Free the fuel hose from the fuel tank.

Remove the two rear fuel tank mounting nuts with a 10 mm socket.

Remove the two front fuel tank mounting bolts.

Take care to not lose the collars. Inspect the rubber grommets for damage and deterioration and replace them as needed.

Lift off the fuel tank.

Shield

Free the throttle cable from the throttle body. See the Throttle Body Removal and Installation topic for more information.

Free the fuel tank heat shield from the frame and lift out the shield.

Installation

Shield

Fit the heat shield into place.

Connect the throttle cable to the throttle body. See the Throttle Body Removal and Installation topic for more information.

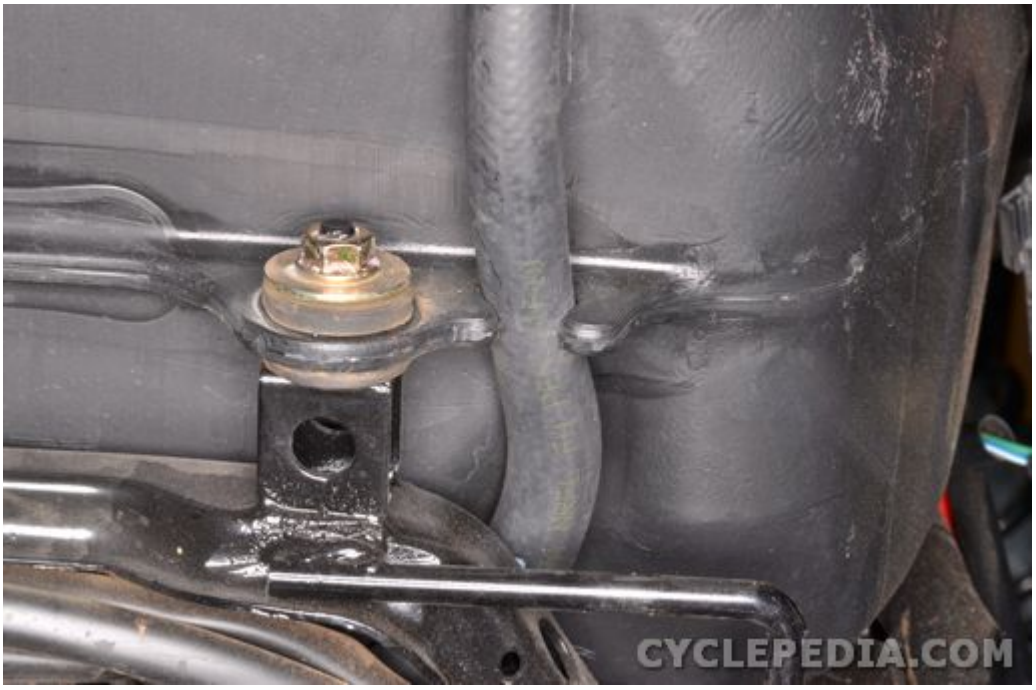
Tank

Lower the fuel tank into place.

Install the fuel tank so that the studs fit into the grommets on the back of the tank. Install the collars.

Install the two front fuel tank mounting bolts and tighten them securely with a 10 mm socket.

Install the two rear fuel tank mounting nuts and tighten them securely with a 10 mm socket.



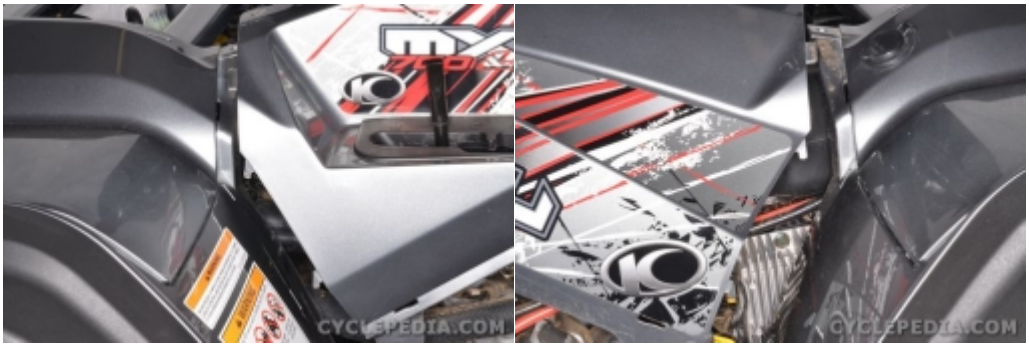
Fit the fuel hose into its stay on the back of the fuel tank.

Connect the fuel hose to the outlet pipe on the fuel pump. Make sure the connector is securely attached to the outlet pipe.

Plug in the fuel pump connecter.

Cover

Temporarily remove the fuel cap.



Fit the fuel tank cover into place. Fit the tabs on the fuel tank cover into the front fender.

Return the fuel cap to the tank.

Install the gearshift knob and trim clip.

Install the four trim clips.

Install the front cover. See the Front Cover topic for more information.

Install the side covers. See the Side Covers topic for more information.

Install the seat. See the Seat topic for more information.

Instrument Cover

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

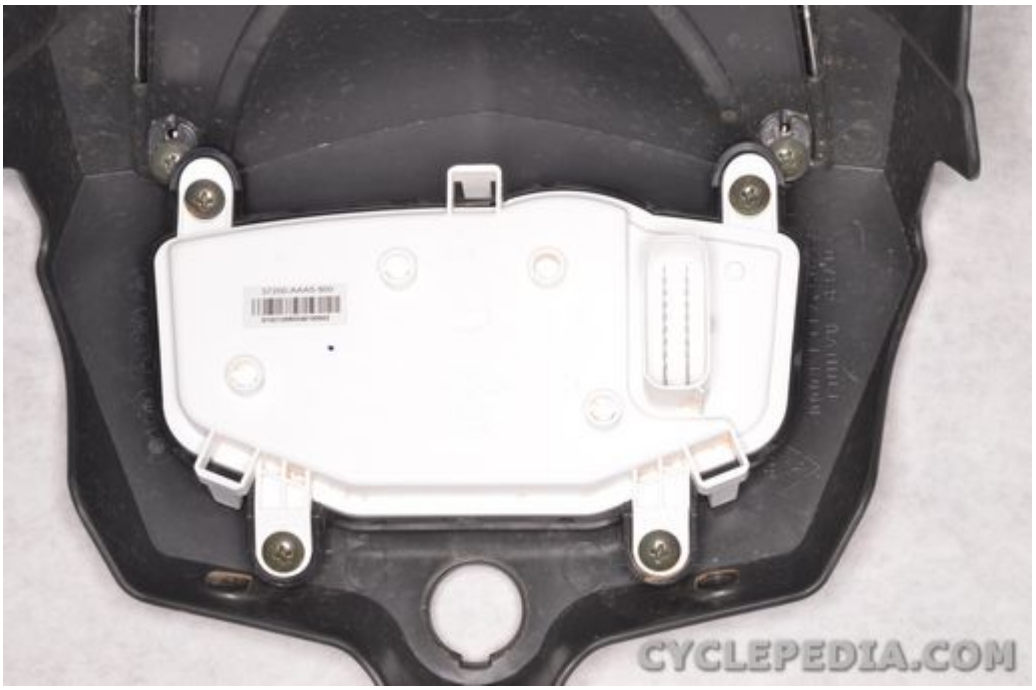
Remove the two screws with a #2 Phillips screwdriver.

Slide the instrument cover forward and free it from the rubber grommet.

Unplug the connector from the back of the instrument display.

Unscrew the ring around the main switch.

Remove the main switch from the instrument cover.

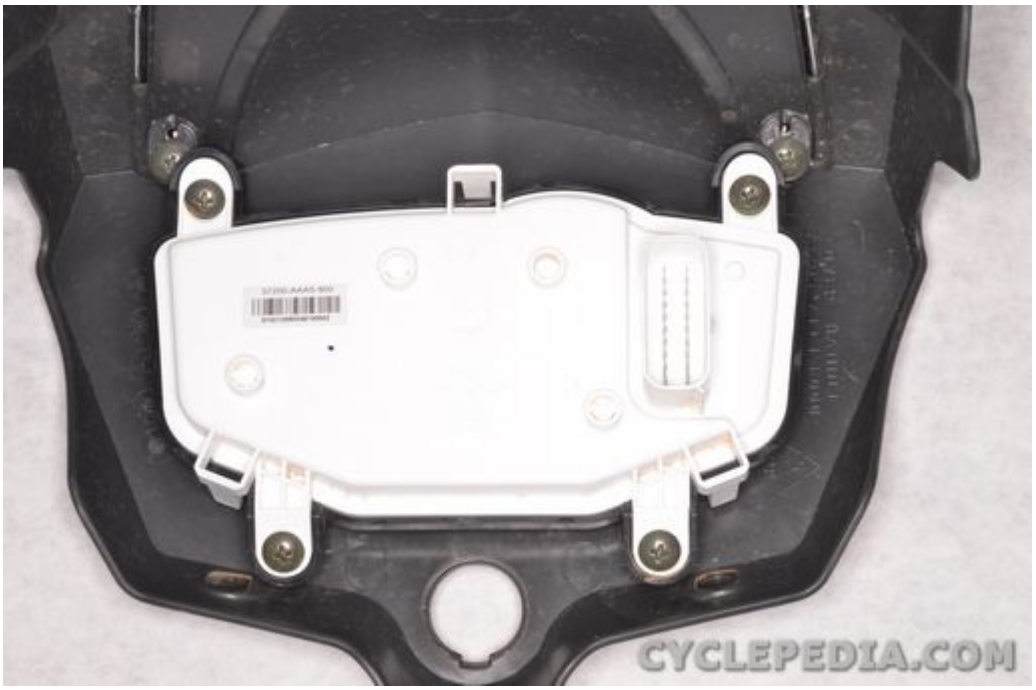


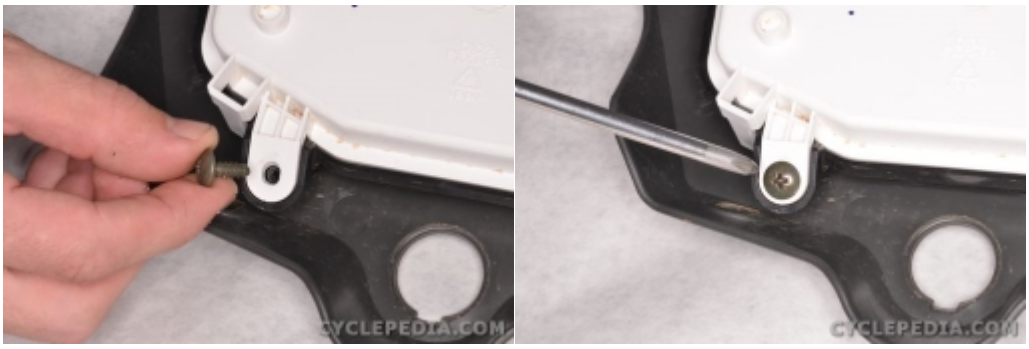
Remove the four screws witch a #2 Phillips screwdriver.

Remove the display from the instrument cover.

Installation

Install the instrument display into the cover.





Tighten the four screws securely with a #2 Phillips screwdriver.

Fit the main switch into the instrument cover.

Install and tighten the ring to secure the main switch.

Plug the connector into the back of the instrument display.

Slide the instrument cover into place so that its post fits into the rubber grommet.

Install the two instrument cover screws with a #2 Phillips screwdriver.

Mudguards and Footrests

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the side covers. See the Side Covers topic for more information.

The mudguards are held to the fenders by screws with nuts.

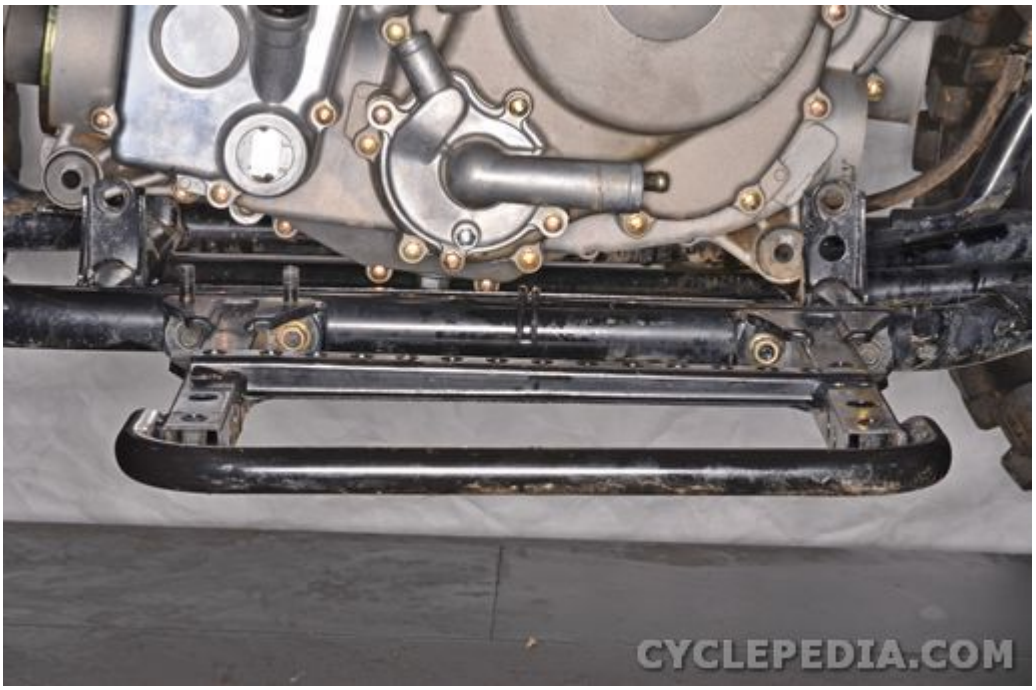
Loosen the screws with a #3 Phillips screwdriver while holding the nuts with a 10 mm wrench.

Remove the four bolts on the bottom of the mudguard with a 10 mm socket.

Lift off the mudguard. To remove the metal footpeg from the mudguard use a 10 mm socket and wrench to remove the nuts ant bolts.

Footrest Brackets

To remove the right footrest bracket first remove the brake pedal. See the Brake Pedal and Master Cylinder topic for more information.



The footrest brackets are mounted to the frame with two nuts and two bolts. Remove the four fasteners and move the bracket out from the frame to remove it.

Install the footrest bracket. Tighten the nuts and bolts securely. Install the brake pedal and master cylinder. See the Brake Pedal and Master Cylinder topic for more information.

Installation

Fit the mudguard into place.

Install the four bottom mudguard bolts with a 10 mm socket.

Install the screws and nuts that hold the mudguards. Tighten the screws with a #3 Phillips screwdriver and the nuts with a 10 mm wrench.

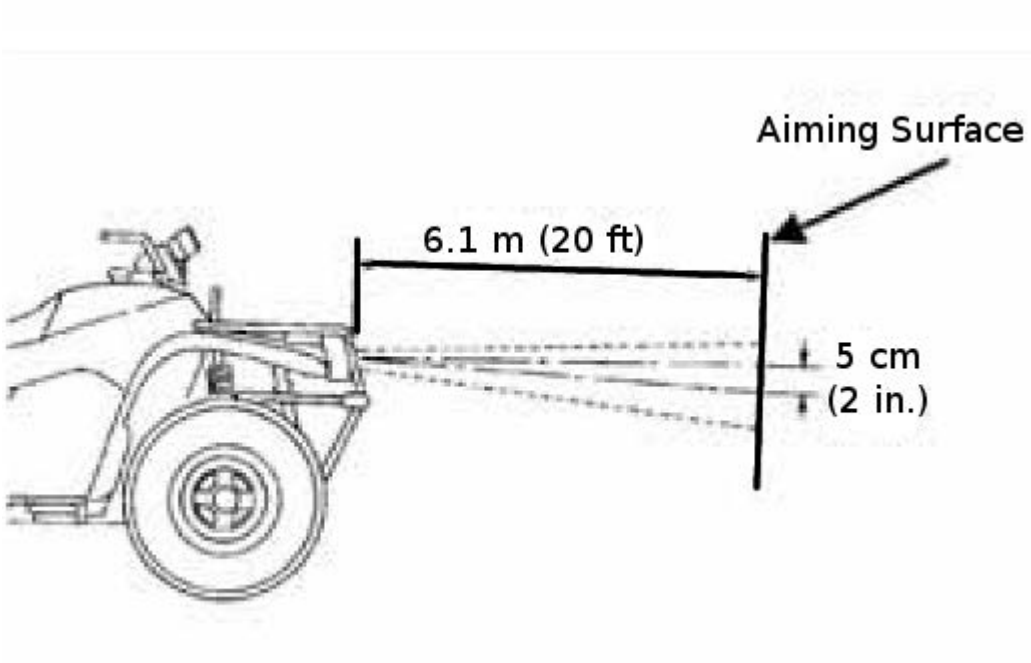
Install the side covers. See the Side Covers topic for more information.

Lights

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Headlight Aim

The headlights can be adjusted vertically and horizontally. The geometric center of the HIGH beam light zone is to be used for vertical and horizontal aiming.



1. Position the ATV on a level floor so the headlights are approximately 6.1 m (20 ft) from an aiming surface (wall or similar aiming surface).

NOTE: There should be an average operating load on the ATV when adjusting the headlight aim.

2. Measure the distance from the floor to the mid-point of each headlight.

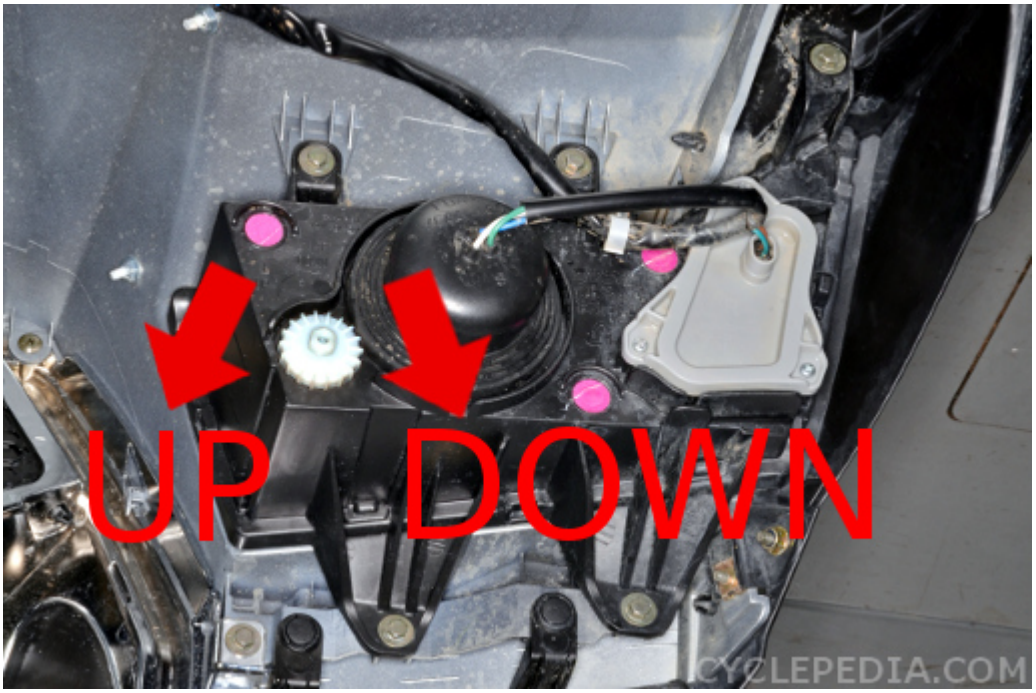
3. Using the measurements obtained in step 2. make horizontal marks on the aiming surface.

4. Make vertical marks which intersect the horizontal marks on the aiming surface directly in front of the headlights.

5. Switch on the lights. Make sure the HIGH beam is on DO NOT USE LOW BEAM.

6. Observe each headlight beam aim Proper aim is when the most intense beam is centered on the vertical mark 5 cm (2 in.) below the horizontal mark on the aiming surface.

7. Adjust each headlight by turning the adjuster knobs as needed.



Headlights

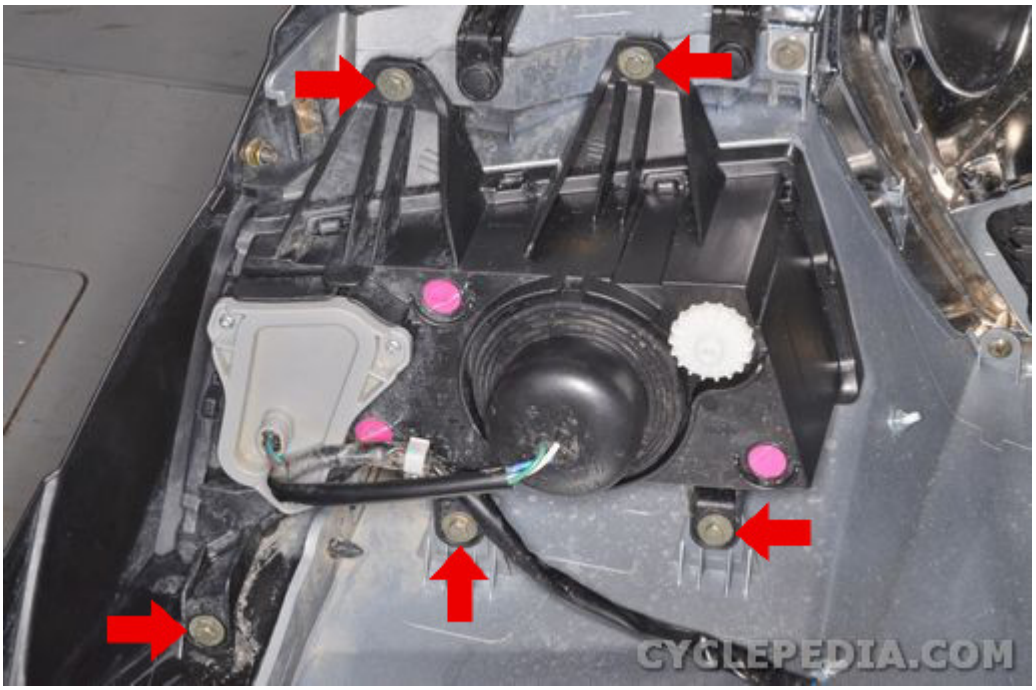
Bulb Replacement

Pull back the rubber cover and unplug the headlight bulb connector.

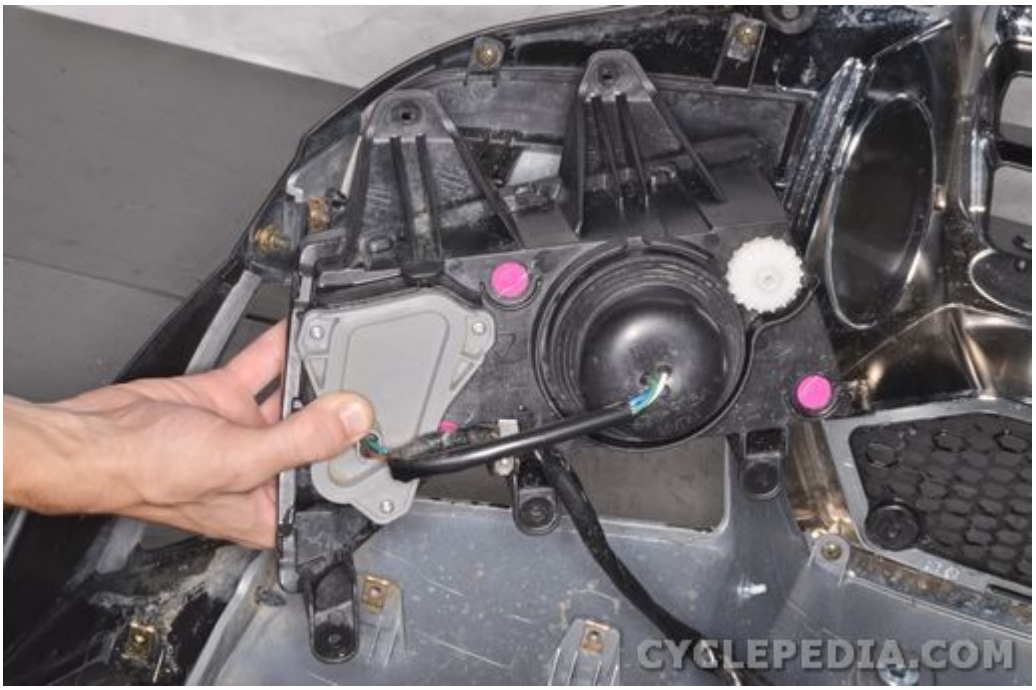
Unhook the bulb clip and replace the bulb as needed. Be sure to secure the bulb with the clip on installation. Return the rubber cover to its installed position when finished.

Removal

Remove the front fender. See the Front Fender topic for more information.



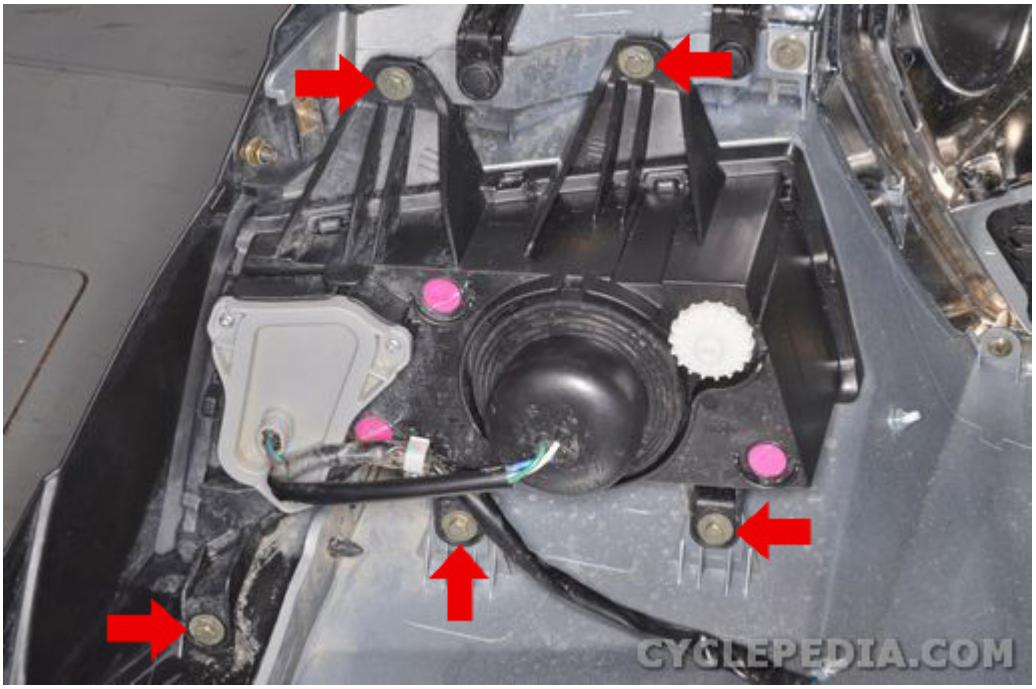
Remove the five screws.



Remove the headlight from the front fender.

Installation

Install the headlight assembly into the front fender.

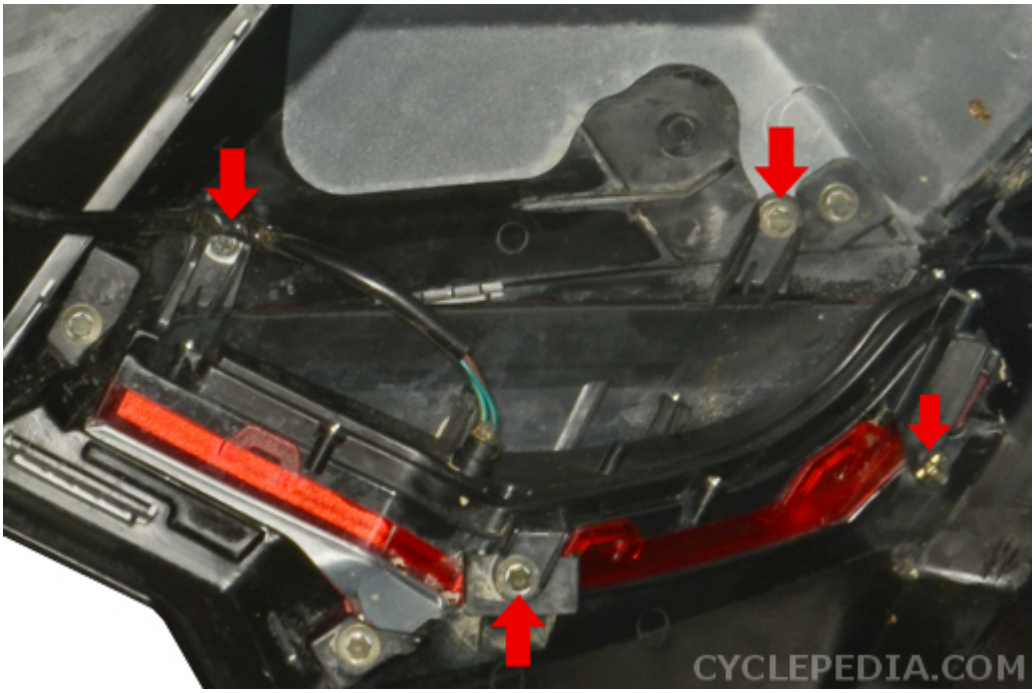


Install the five screws and tighten them securely.

Taillights

Removal

Remove the rear fender. See the Rear Fender topic for more information.

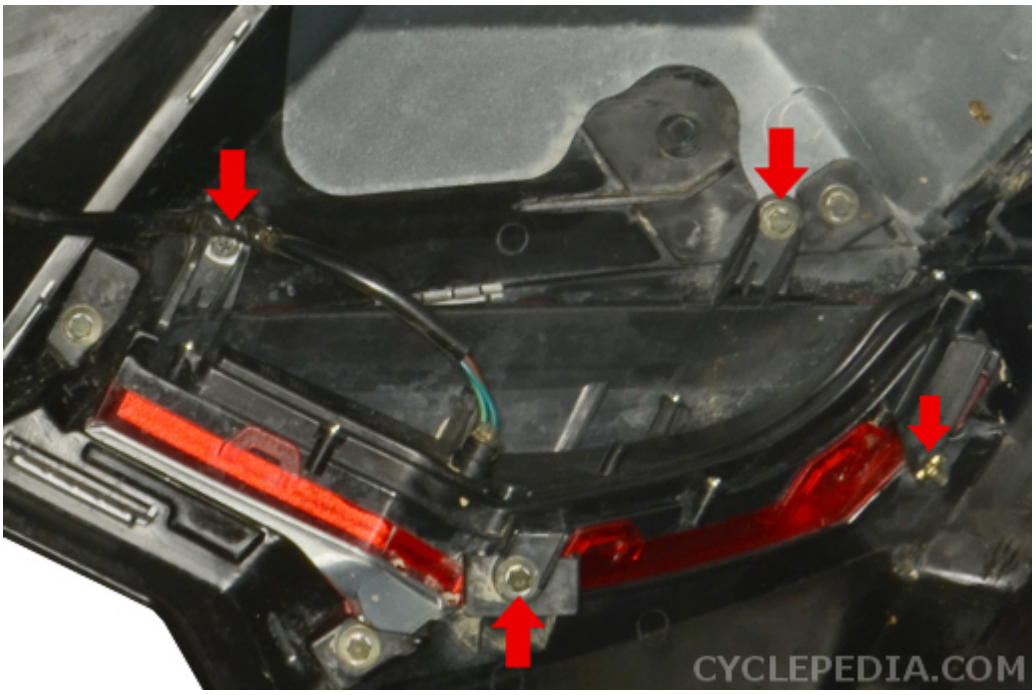


Free the taillight wires from the clamp with the inner screw. Remove the four taillight screws.

Remove the taillight from the rear fender. The taillights are LED that must be replaced as a unit if they fail.

Installation

Fit the taillight unit into place.



Install the four taillight screws and tighten them securely. Guide the wires through the clamp with the inner bolt.

Install the rear fender. See the Rear Fender topic for more information.

Racks

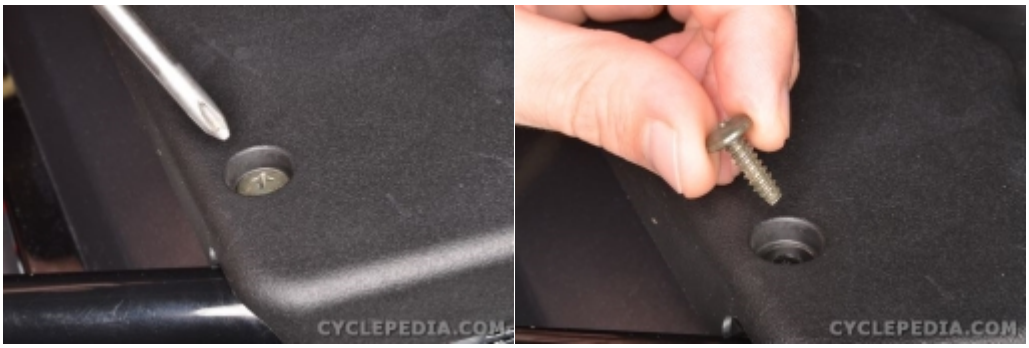
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Take care not to lose the collars and grommets in the fenders.

Front

The front rack cover is mounted with four screws.



Remove the four screws with a #2 Phillips screwdriver.

Remove the cover from the front rack.

The front rack is mounted with four bolts.

Remove the front rack bolts with a 12 mm socket.

Lift off the front rack.

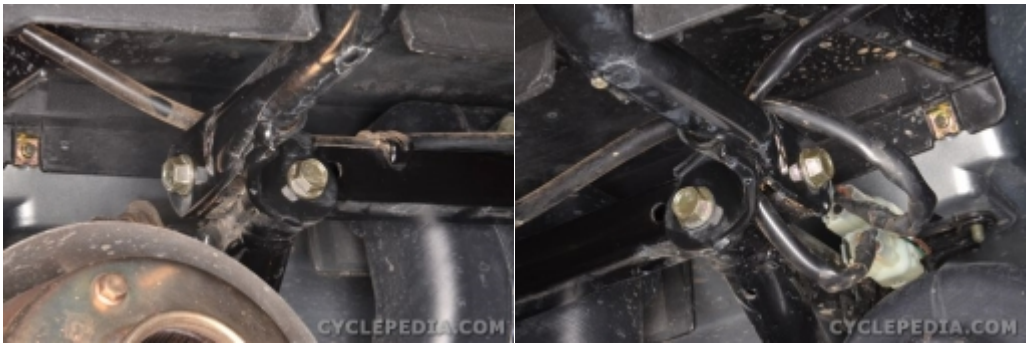
Rear

Remove the seat. See the Seat topic for more information.

Remove the two forward bolts with a 12 mm socket.

Remove the two rear bolts with a 10 mm socket.

Remove the two under bolts with a 10 mm socket.



Remove the two corner bolts from each side with a 12 mm socket.

Remove the rear rack.

Installation

Install the grommets and collars into the fenders.

Front Rack

Fit the front rack into place.

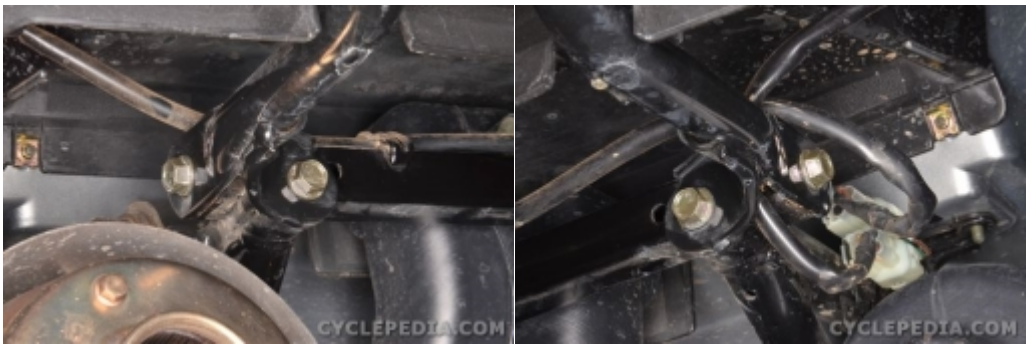
Install the four front rack bolts. Tighten the front rack bolts securely with a 12 mm socket.

Fit the front rack cover into place.

Install front rack cover with the four screws. Tighten the screws securely with a #2 Phillips screwdriver.

Rear Rack

Fit the rear rack into place.



Install the two corner bolts into each side and tighten them securely with a 12 mm socket.

Install the two under bolts and tighten them securely with a 10 mm socket.

Install the two rear bolts and tighten them securely with a 10 mm socket.

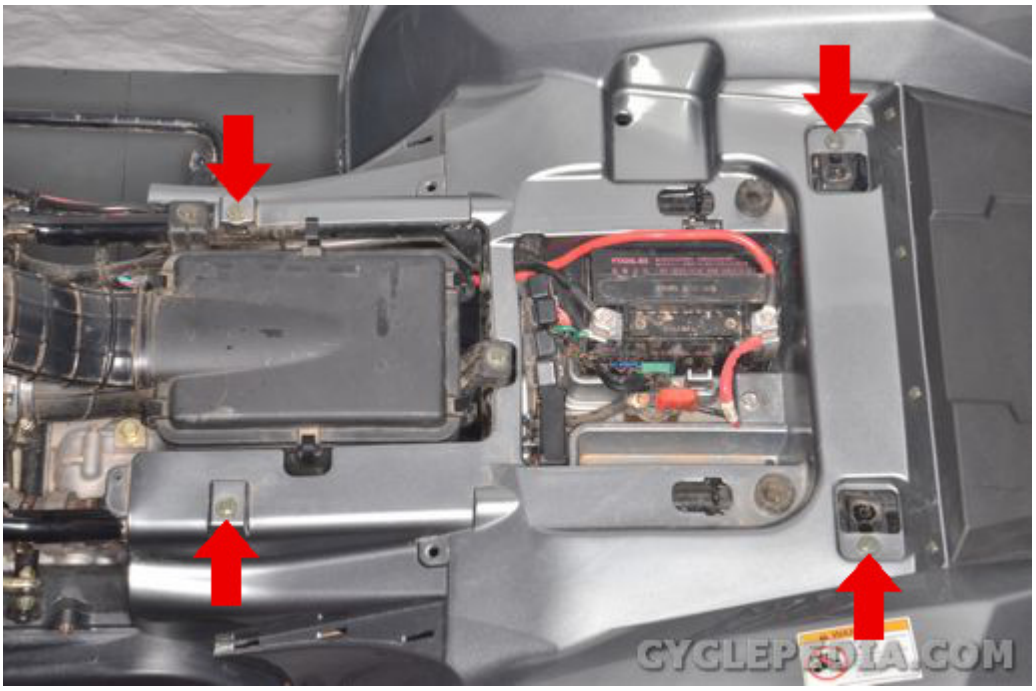
Install the two forward bolts and tighten them to specification with a 12 mm socket.

Rear Fender

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Rear rack	Racks
Seat	Seat
Rear mudguard screws	Mudguards and Footrests
Side covers	Side Covers
Battery	Battery



Remove the four rear fender bolts with an 8 mm socket.

Free the starter relay from the rear fender.

Unplug the starter relay from the connector.

Free the fuse box from the rear fender.

Free the relays from the rear fender.

Route the fuse box, relays, and electrical connectors through the fender as the fender is removed.

Unplug the taillight connectors.

Free the left taillight wires from the clamp.

Lift off the rear fender.

Take care not to lose the collars and grommets.

Fender Installation

Fit the rear fender into place.

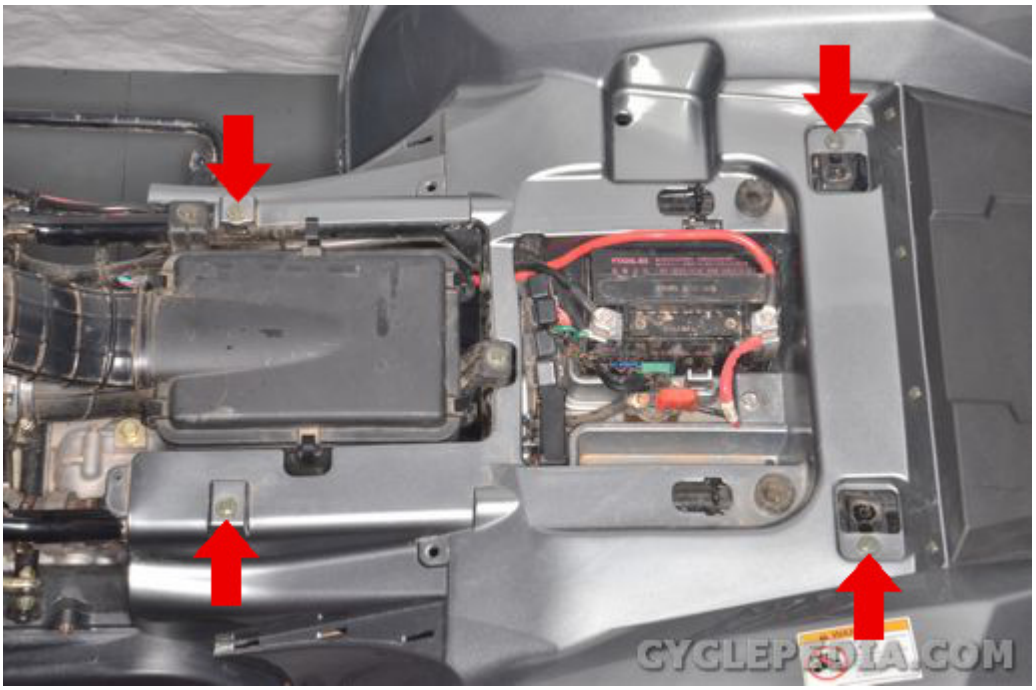
Route the fuse box, relays, and electrical connectors through the fender as the fender is installed.

Fit the fuse box into place on the rear fender.

Install the relays into place on the rear fender.

Plug in the starter relay connector.

Install the starter relay into the rear fender.



Install the four rear fender bolts and tighten them securely with an 8 mm socket.

Install these components	
Component	Topic
Battery	Battery

Side covers	Side Covers
Mudguards	Mudguards and Footrests
Seat	Seat
Rear rack	Racks

Seat

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

The release lever for the seat is located under the right side of the seat towards the back.

Pull up on the seat release lever and lift up on the back of the seat.

Move the seat to the rear and remove it from the frame. The tool kit is located under the seat.

Installation

Fit the seat into place.

Guide the tabs at the front of seat into place.

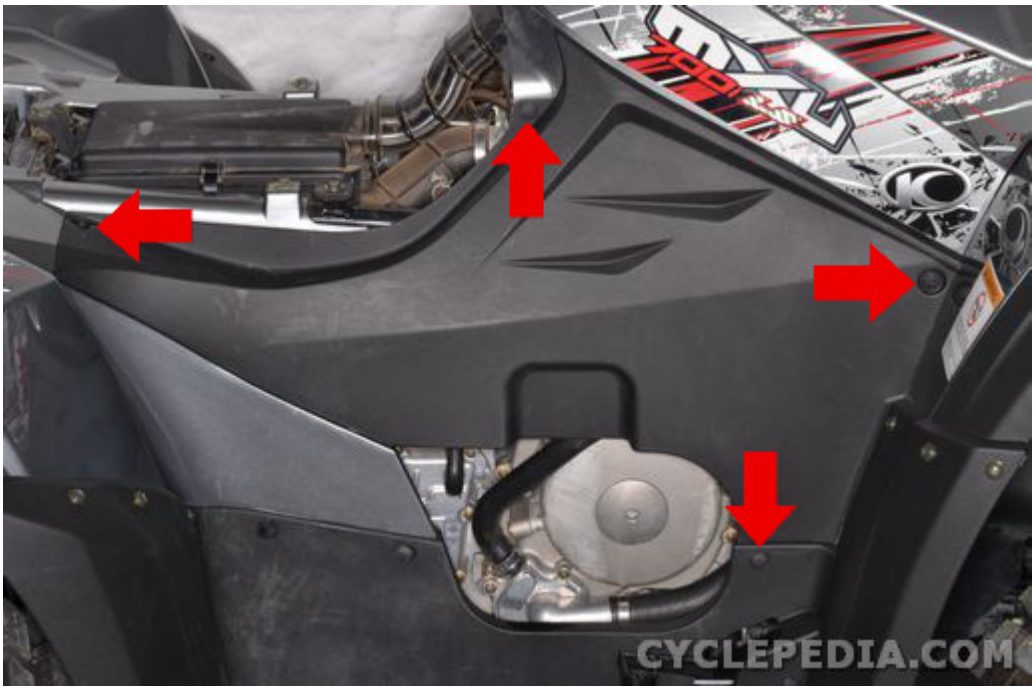
Push down on the back of the seat and lock it into position.

Side Covers

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the seat. See the Seat topic for more information.



Both side covers are held on by four trim clips and tabs.

Remove the trim clips.

Free the side cover tabs.

Remove the side covers.

Installation

Fit the side covers into place.

Engage the side cover tabs.

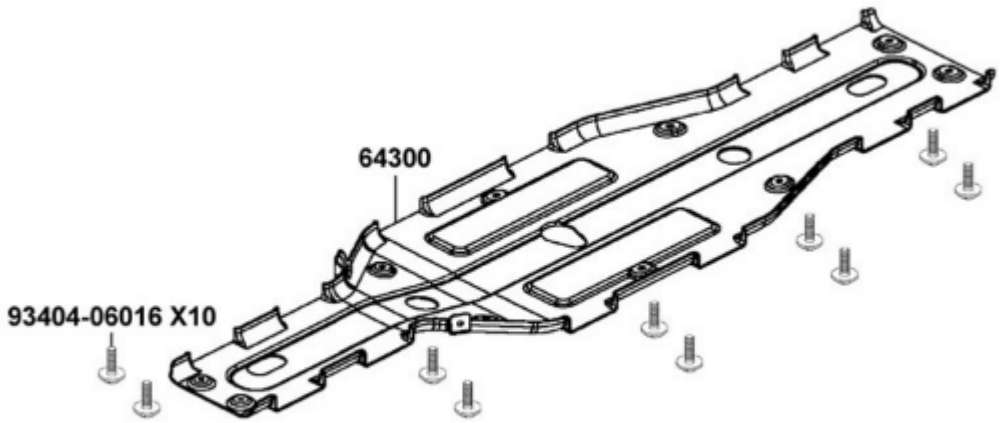
Install the four trim clips for each side cover.

Install the seat. See the Seat topic for more information.

Skid Plate

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal



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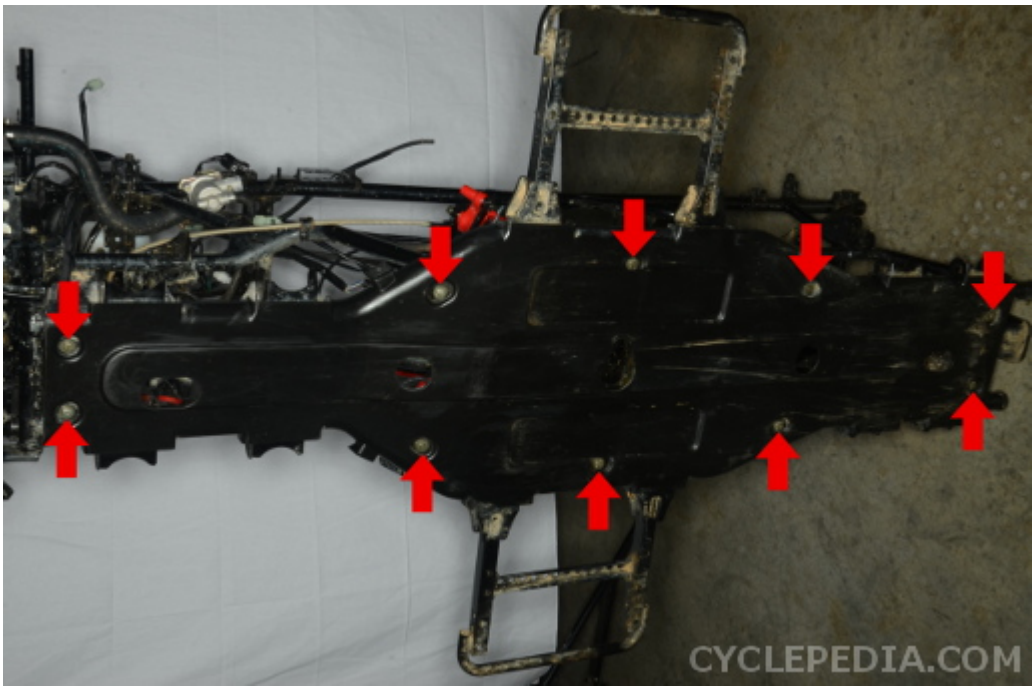
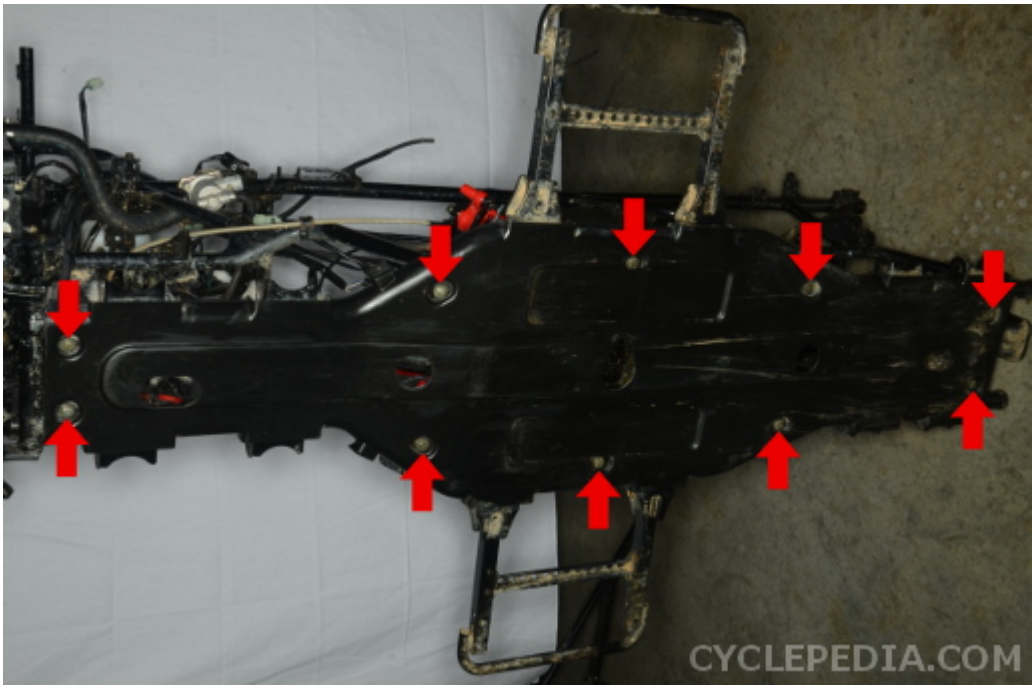


Remove the ten skid plate bolts

Installation



Fit the skid plate into place. Install the ten bolts and tighten them securely.

5.Engine MXU 500i

This chapter covers the location and servicing of the engine components for the KYMCO MXU 500i. For the engine in the MXU 700i see the Engine MXU700i topic.

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GENERAL INSTRUCTIONS

Lubrication System

The maintenance of lubrication system can be performed with the engine installed in the frame. Use care when removing and installing the oil pump not to allow dust and foreign matters to enter the engine

If any portion of the oil pump is worn beyond the specified service limits. replace the oil pump as an assembly. After the engine has been installed check that there are no oil leaks and that oil pressure is correct.

Lubrication System Diagram

TROUBLESHOOTING

Oil level too low

• Natural oil consumption
• Oil leaks
• Worn or poorly installed piston rings
• Worn valve guide or seal

Oil contamination (White appearance)

• From coolant mixing with oil
- Faulty water pump mechanical seal
- Faulty head gasket
- Water leak in crankcase

No oil pressure

- Oil level too low
- Oil pump drive chain broken
- Oil pump drive sprocket broken
- Oil pump damaged (pump shaft)
- Internal oil leak

Low oil pressure

- Pressure relief valve stuck open
- Clogged oil filter and strainer screen
- Oil pump worn or damaged
- Internal oil leak
- Incorrect oil being used
- Oil level too low

High oil pressure

- Pressure relief valve stuck closed
- Plugged oil filter, gallery, or metering orifice
- Faulty oil pump

Seized engine

- No or low oil pressure
- Clogged oil orifice/passage
- Internal oil leak
- Non-recommended oil used

Oil contamination

• Deteriorated oil
• Faulty oil filter
• Worn piston ring (White appearance with water or moisture)
- Damaged water pump mechanical seal
- Damaged head gasket
- Oil relief not frequent enough

Cylinder Head, Camshaft, and Valves

• The cylinder head can be serviced with the engine installed in the frame. Coolant in the radiator and water jacket must be drained.

• When assembling, apply molybdenum disulfide grease or engine oil to the valve guide, movable parts, and valve arm sliding surfaces for initial lubrication.

• The valve rocker arms are lubricated by engine oil through the engine oil passages. Clean and unclog the oil passages before assembling the cylinder head.

• After disassembly, clean the removed parts and dry them with compressed air before inspection.

• After removal, mark and arrange the removed parts in order. When assembling, install them in the reverse order of removal. The remove components should be returned to their original positions.

TROUBLESHOOTING

• The poor cylinder head operation can be diagnosed by a compression test or by tracing engine top-end noises.

Poor performance at idle speed

• Compression too low

Compression too low

• Incorrect valve clearance adjustment
• Burned or bent valves
• Incorrect valve timing
• Broken valve spring
• Poor valve and seat contact
• Leaking cylinder head gasket
• Warped or cracked cylinder head
• Poorly installed spark plug

Compression too high

• Excessive carbon build-up in combustion chamber

Abnormal noise

• Incorrect valve clearance adjustment
• Sticking valve or broken valve spring
• Damaged or worn camshaft
• Worn cam chain tensioner
• Worn camshaft and rocker arm

White smoke from exhaust muffler

• Worn valve stem or valve guide
• Damaged valve stem oil seal

Cylinder and Piston

• The cylinder and piston can be serviced with the engine installed in the frame.

• After disassembly, clean the removed parts and dry them with compressed air before inspection.

• When installing the cylinder, use a new cylinder gasket and make sure that the dowel pins are correctly installed.

TROUBLESHOOTING

When hard starting or poor performance at low speed occurs, check the crankcase breather for white smoke. If white smoke is found, it means that the piston rings are worn, stuck or broken.

Compression too low or uneven compression

• Worn, stuck or broken piston rings
• Worn or damaged cylinder and piston

Compression too high

• Excessive carbon build-up in combustion chamber or on piston head.

Excessive smoke from exhaust muffler

• Worn or damaged piston rings
• Worn or damaged cylinder and piston

Abnormal noisy piston

- Worn cylinder, piston and piston rings
- Worn piston pin hole and piston pin
- Incorrectly installed piston

Cylinder Head Cover

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Right mudguard	Mudguards and Footrests
Spark plug	Spark Plug

Disconnect the crankcase breather hose from the cylinder head cover.

Remove the four bolts, washers and rubber grommets with a 10 mm socket.

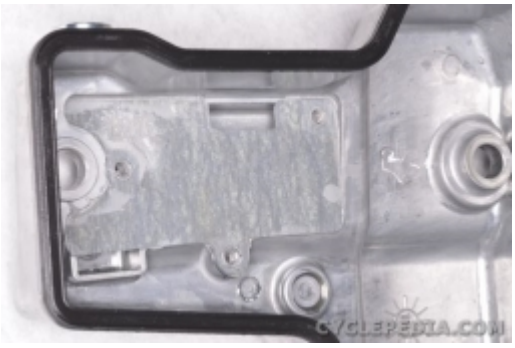
Remove the cylinder head cover.

Remove the cylinder head cover gasket.

Clean the mating surfaces of the cylinder head and cover.

Disassembly

Remove the three breather separator bolts with a 10 mm socket.



Remove the breather separator.

Assembly

Install the breather separator.

Install the three breather separator bolts and tighten them to specification with a 10 mm socket.

ITEM	N-m	kgf-m	ft-lb
Breather separator bolt	13	1.3	9

Installation

Apply fluid gasket (threebond: 1215) to the mating surface of the cylinder head cover, then install the rubber gasket.

Install the cylinder head cover.

Install the four grommets and washers onto the cylinder head cover. Install the four bolts.

Tighten the cylinder head cover bolts a small amount at a time in a crisscross pattern. Tighten the bolts to specification with a 10 mm socket.

ITEM	N-m	kgf-m	ft-lb
Cylinder head cover bolt	10	1.0	7.2

Connect the crankcase breather hose to the cylinder head cover. Secure the hose with the clamp.

To remove the camshafts see the Camshaft topic.

Camshaft

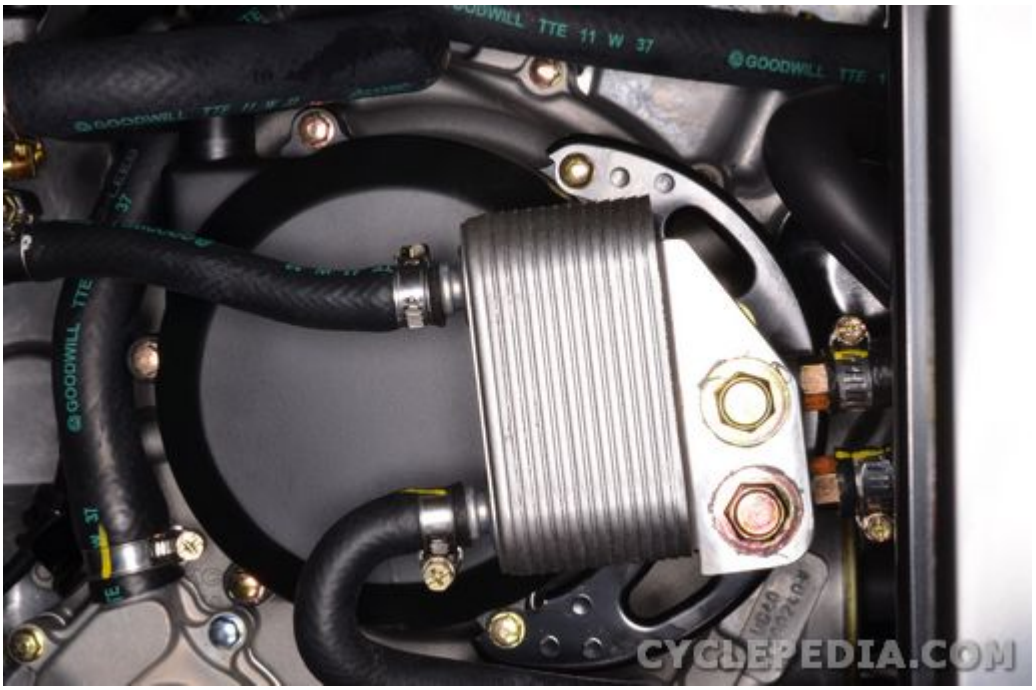
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

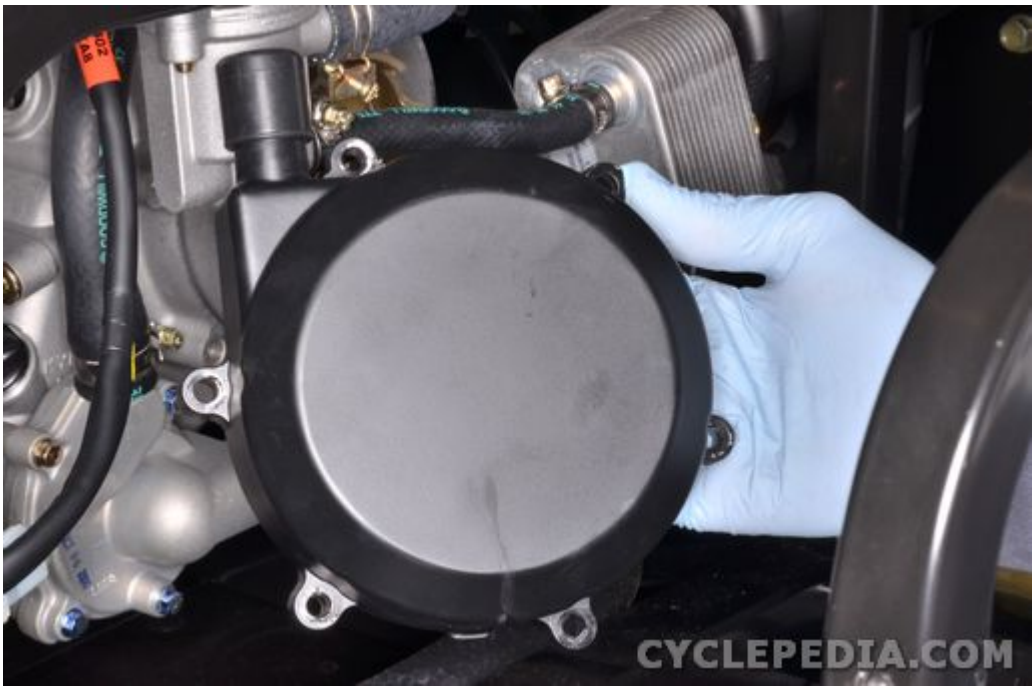
Remove the cylinder head cover. See the Cylinder Head Cover topic for more information.

Remove the spark plug. See the Spark Plug topic for more information.

Remove the timing cap on the right side of the engine with a flat blade screwdriver. Inspect the O-ring and replace it as needed.



Remove the recoil starter cover bolts with an 8 mm socket.



Remove the recoil starter cover.

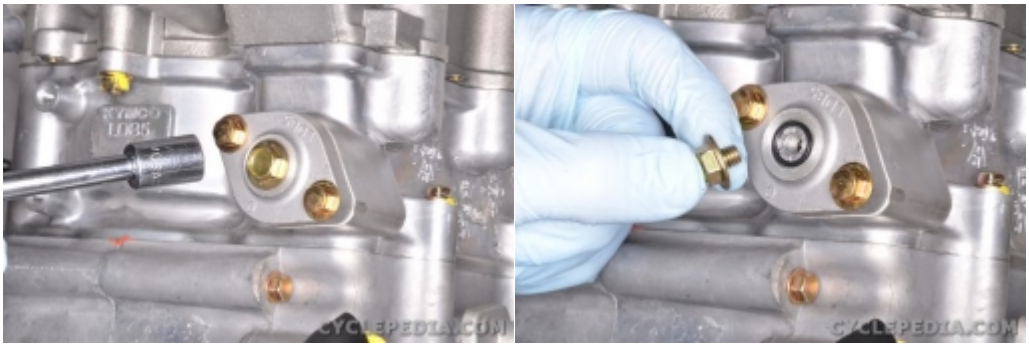
Turn the crankshaft clockwise with a socket.

Align the "T" mark on the flywheel with the index mark on the right crankcase cover. This shows the piston is at Top Dead Center.

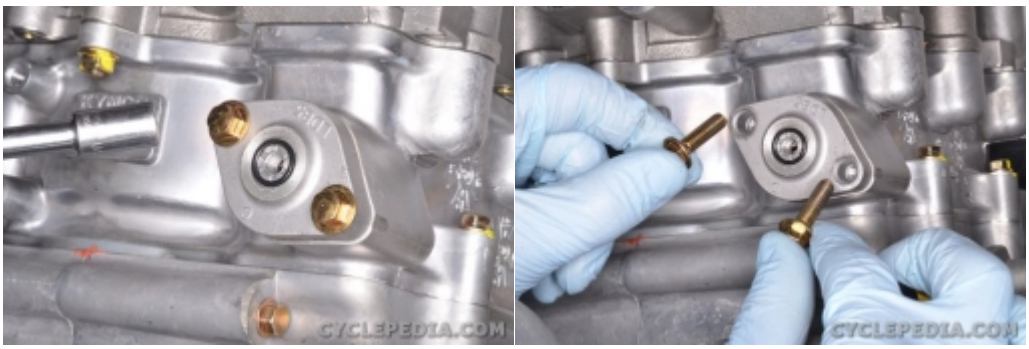
Make sure the punch marks on the ends of the camshafts are pointed up. With the marks pointing up the piston is at TDC on the compression stroke. If the punch marks are not pointing up rotate the crankshaft clockwise until the piston is at TDC on the compression stroke.

Cam Chain Tensioner

Note: Do not remove the cam chain tensioner until the crank and piston have been turned positioned at TDC.



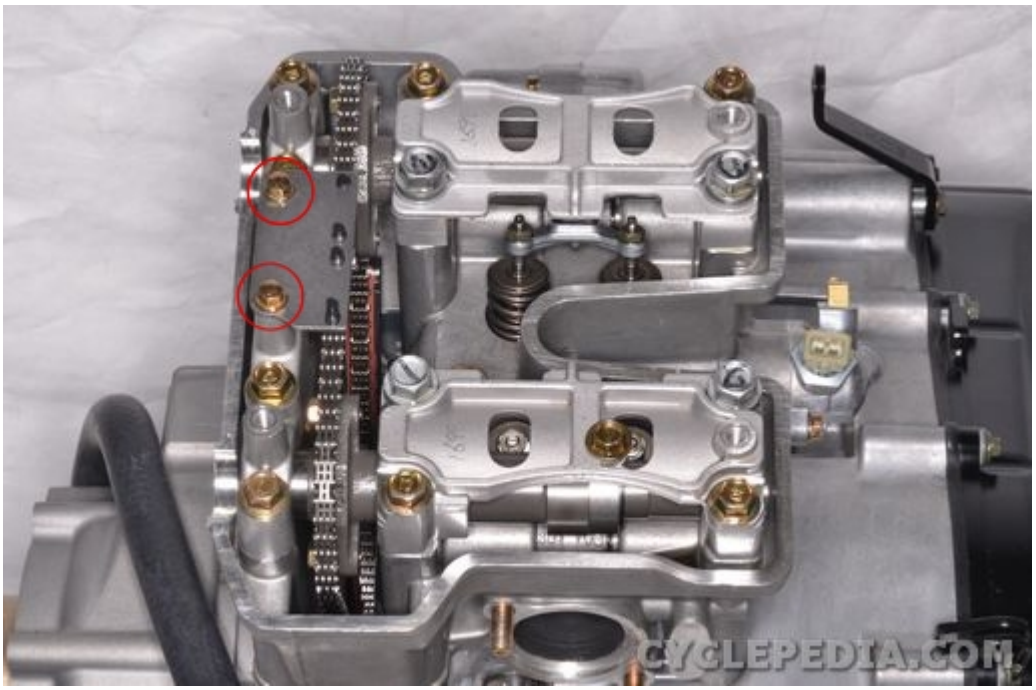
Remove the cam chain tensioner sealing bolt with a 10 mm socket.



Remove the two cam chain tensioner bolts with an 8 mm socket.

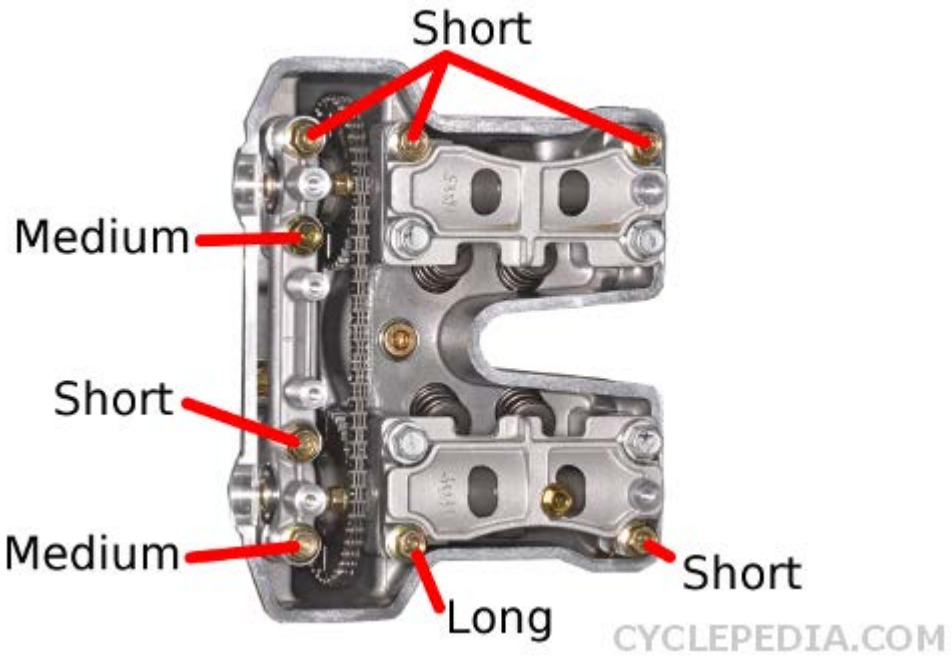
Remove the cam chain tensioner and gasket.

Camshafts



Remove the two cam chain guide bolts with an 8 mm socket.

Remove the cam chain guide.



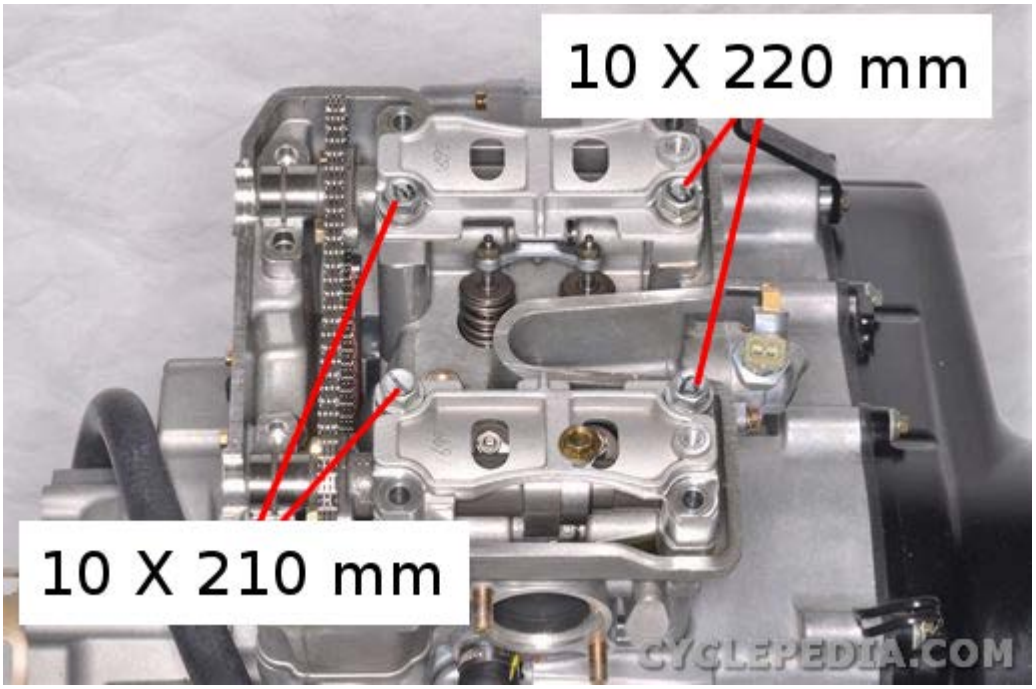
Loosen the indicated eight camshaft holder bolts a small amount at a time in a crisscross pattern with a 12 mm socket. There are five short bolts, two medium bolts, and one long bolt.

The five short bolts are size 8 X 71 mm.

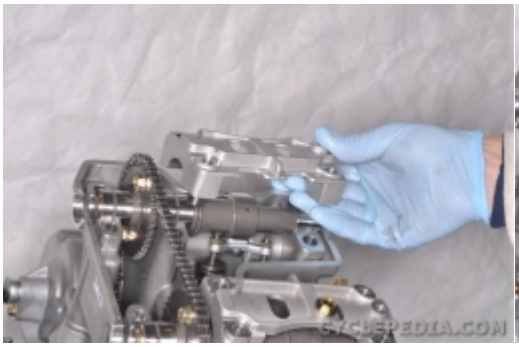
The two medium bolts are size 8 X 137 mm.

The size of the long bolt is 8 X 210 mm.

Remove the cam chain side camshaft holder and the two dowel pins.



Slowly loosen and the remaining four camshaft holder bolts a small amount at a time in a crisscross pattern with a 14 mm socket. Remove the two 10 X 220 mm and two 10 X 210 mm camshaft holder bolts.



Remove the camshaft holders and dowel pins. Note the position of the camshaft holders so that they can be returned to their original positions.

Lift the cam chain and remove the cam shafts and sprocket.

Note: Do not let the cam chain fall into the bottom end of the engine.

Secure the cam chain with a piece of wire to keep if from falling into the bottom end of the engine.

Rocker Arms

Note the location of the rocker arm components so that they can be returned to their original positions.

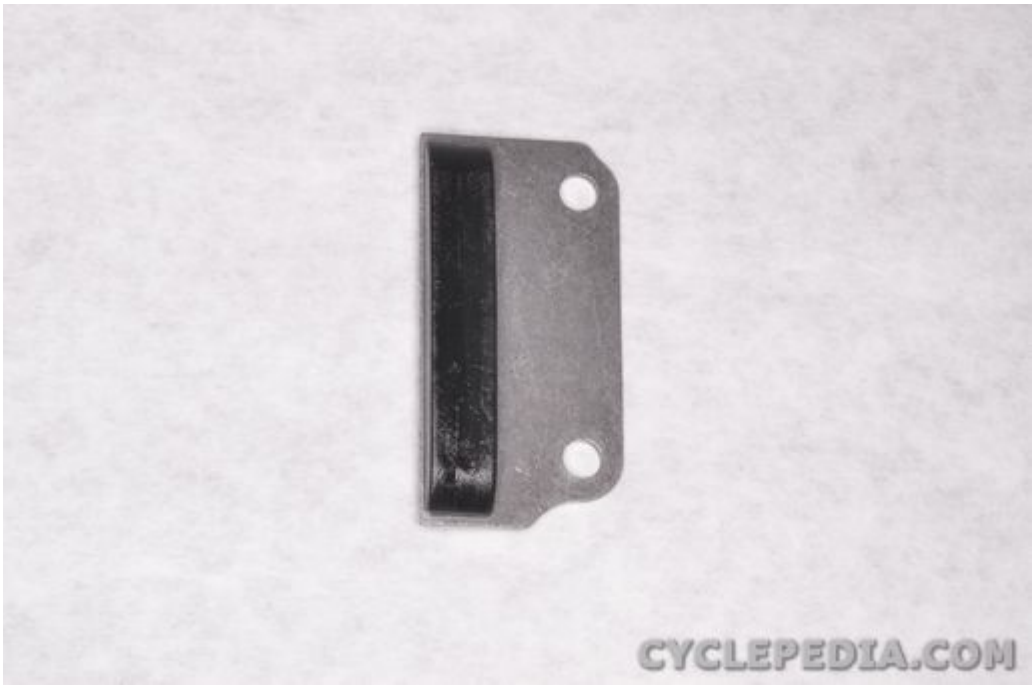
The rocker arms shafts must be removed from the side of the cylinder head opposite the cam chain.

Loosen the rocker arm shafts with a 10 mm Allen.

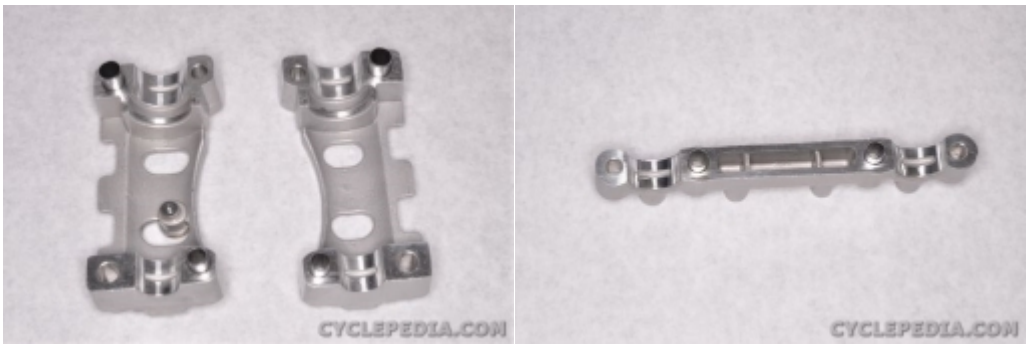
Remove the rocker arm shafts and washers from the cylinder head.

Remove the rocker arms from the cylinder head.

Inspection

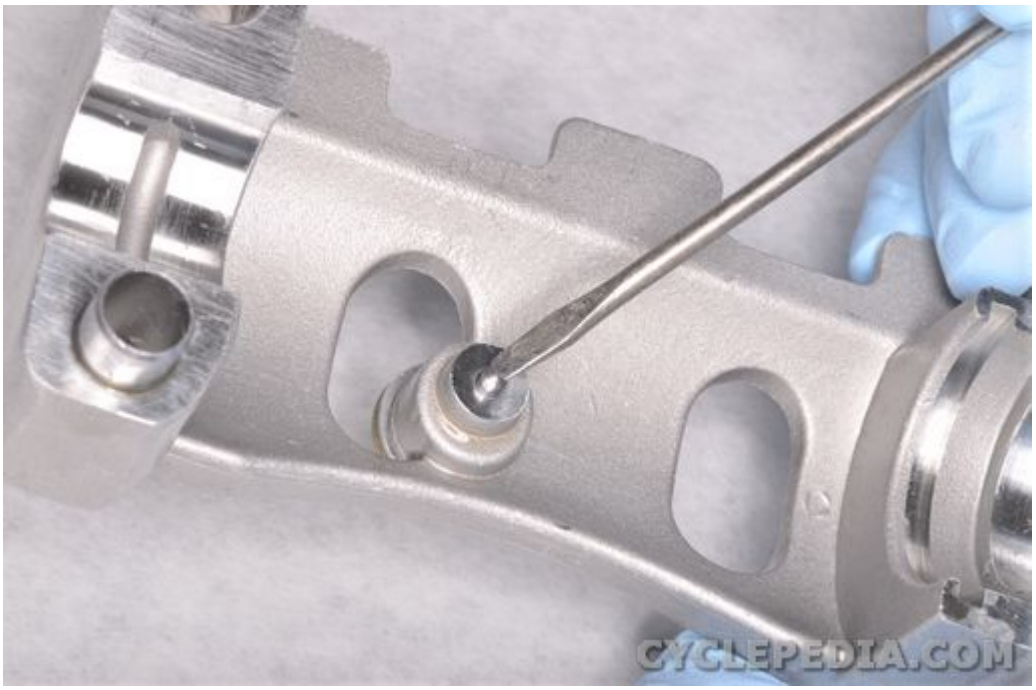


Inspect the cam chain slipper surface of the cam chain guide for wear or damage.



Inspect the camshaft surface of each camshaft holder for scoring, scratches, or other damage.

Note: Always replace the camshaft holders and cylinder head as a set.



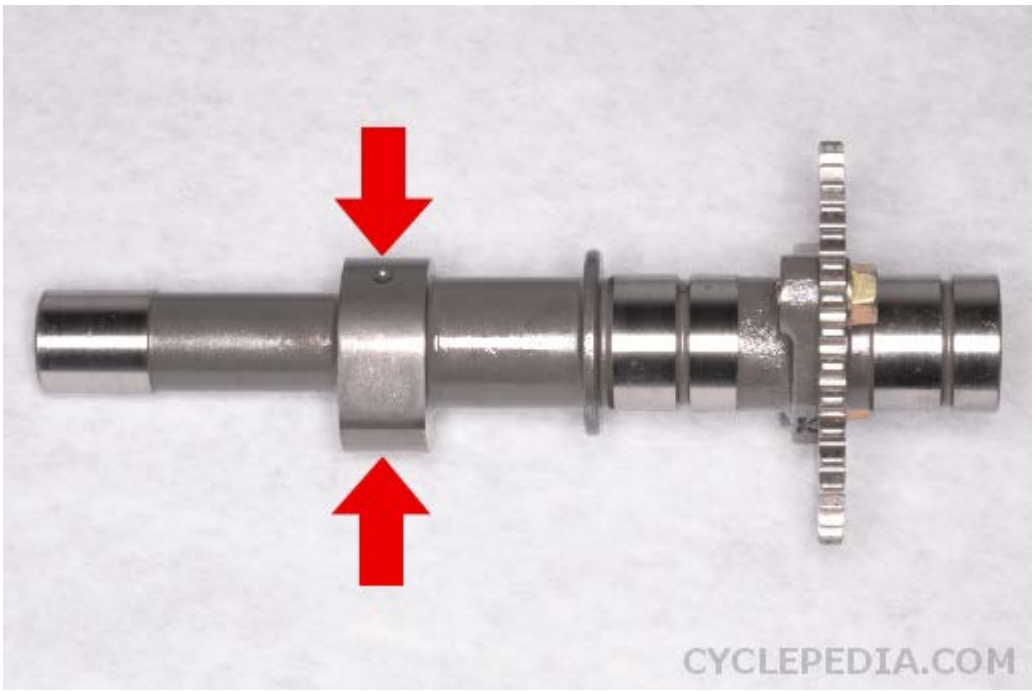
Check the stop pin spring on the exhaust camshaft holder.

The pin should move smoothly in and out without binding. Replace the stop pin assembly as needed.

Check that the cam chain tensioner is functioning properly. Make sure the push rod slides smoothly when the locking mechanism is released.

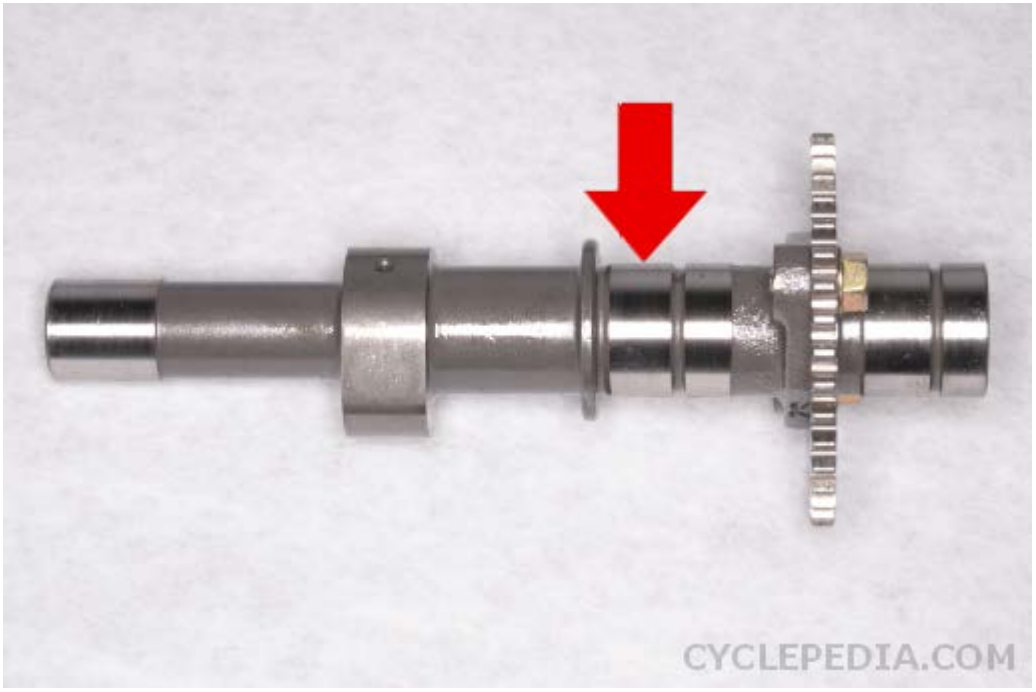
Inspect the camshaft sprocket for wear and damage.

Inspect the camshaft lobes and journals wear and damage. If there are signs of damage or discoloration inspect the lubrication system.



Measure the maximum height of the cam lobes with vernier calipers or a micrometer.

Item		Standard mm (in)	Service Limit
Cam lobe height	IN	37.2614 (1.4905)	37.11 (1.4844)
	EX	37.0084 (1.4803)	36.86 (1.4744)

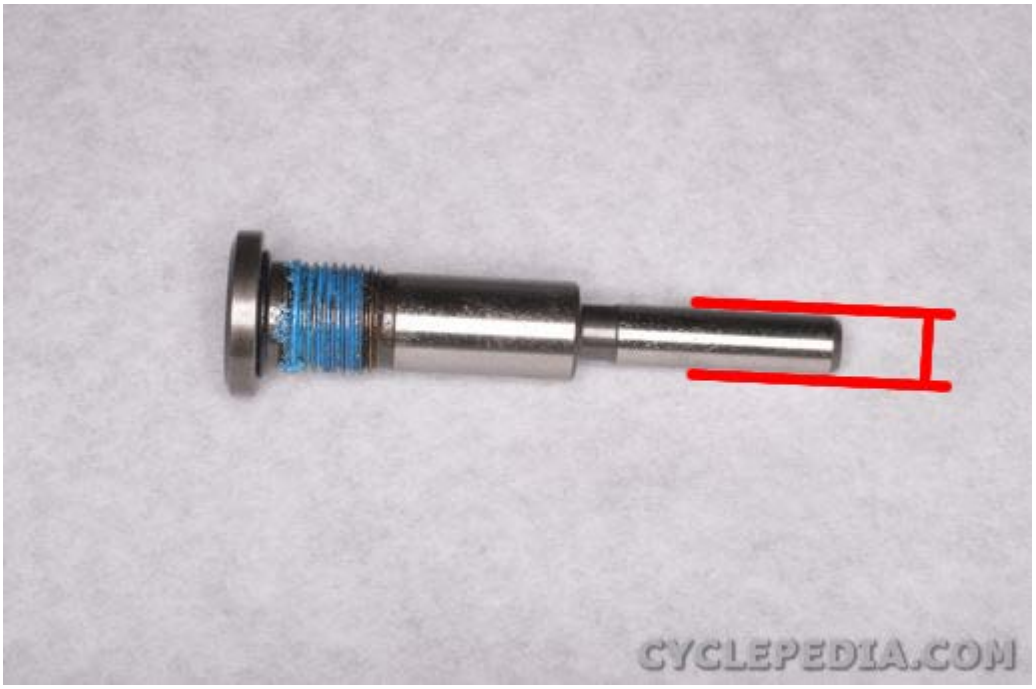


Place the ends of the camshafts in V-blocks and check the runout with a dial gauge.

Camshaft Runout Limit (IN & EX)	0.05 mm (0.002 in)

Check the decompression system by turning the decompressor cam on the exhaust camshaft.

You should be able to turn the decompressor cam clockwise smoothly, but the decompressor should not turn counterclockwise. If you can't see the video above upgrade your browser to HTML 5 capable or click here - VIDEO.



Check the rocker arm shafts for signs of damage and wear. If there are signs of damage or discoloration inspect the lubrication system. Measure the outside diameter of the rocker arm shafts in several locations.

Item		Standard mm (in)	Service Limit
Valve rocker arm shaft O.D.	IN	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)
	EX	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)

Inspect the rocker arms for damage and wear. If there are signs of damage or discoloration inspect the lubrication system. Measure the inside diameter of the rocker arms in several locations.

Item		Standard mm (in)	Service Limit
Valve rocker arm I.D.	IN	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)
	EX	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)

To install the camshafts and rocker arms see the Camshaft Installation topic.

Camshaft Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Installation

Rocker Arms

Lubricate the inside diameter of the rocker arms and the outside diameter of the rocker arm shaft pivot sections with fresh engine oil.

Fit the rocker arms into their original locations.

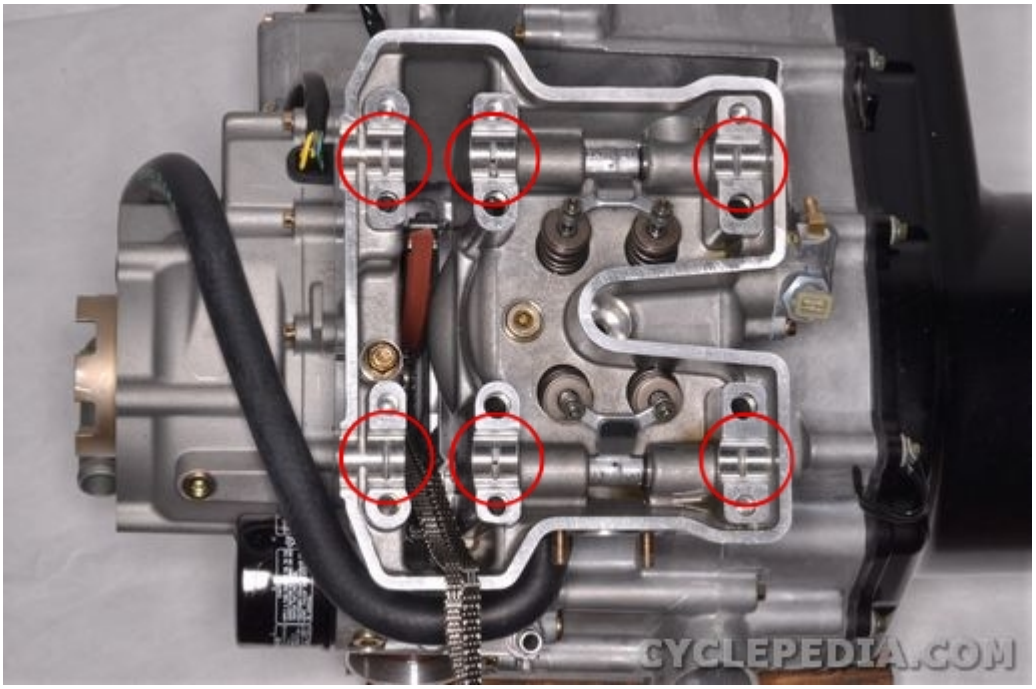
Apply Blue Loctite to the threads of the rocker arm shafts. Install the rocker arm shafts and washers.

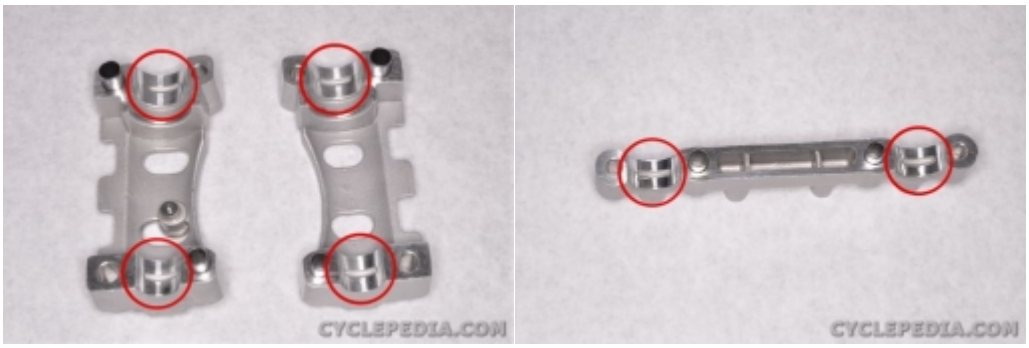
Tighten the rocker arm shafts to specification with a 10 mm Allen.

Item	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)
Rocker arm shaft	18	4.5 (45, 32)

Camshafts

Position the piston at TDC as with removal. See the Camshaft topic for more information. Align the "T" mark on the flywheel with the index mark on the right crankcase cover. This shows the piston is at Top Dead Center.





Apply molybdenum oil to the camshaft lobes, the journal holders in the camshaft holders and the cylinder head.

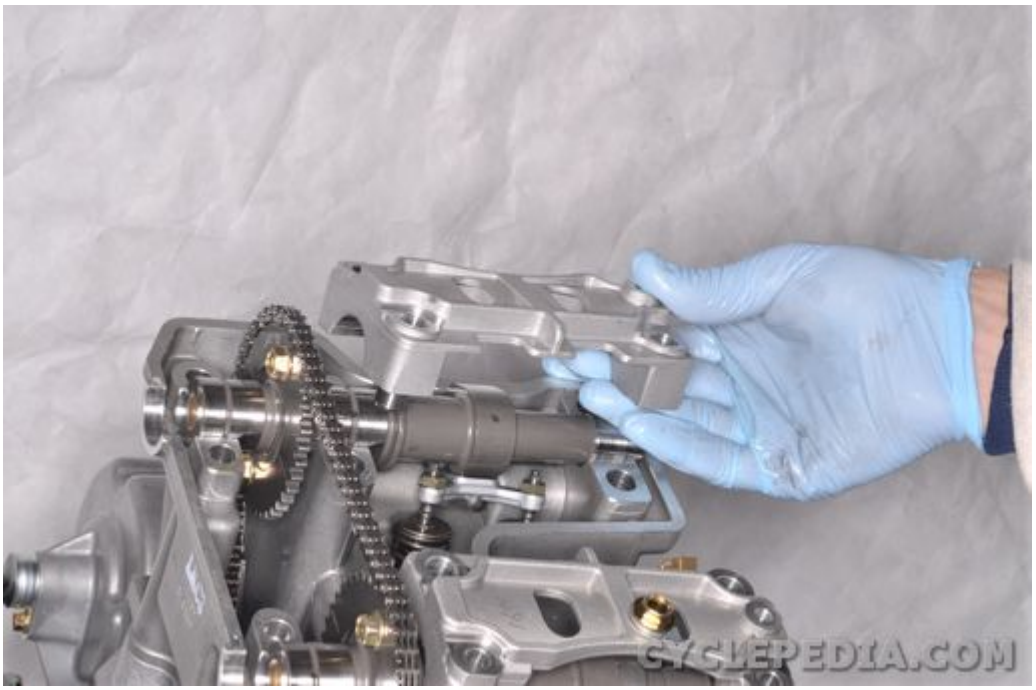
Molybdenum oil: a mixture of molybdenum grease and fresh engine oil in a 50:50 ratio.

Fit the camshafts into place. Note the exhaust camshaft has a decompressor cam and intake camshaft doesn't.

Position the camshafts so that the punch marks on the end are pointing up. Minimize the amount of slack in the cam chain between the camshaft sprockets. The lines on the camshaft sprockets must align with the cylinder head cover mating surface as shown.

Double check the timing after the cam chain tensioner is installed.

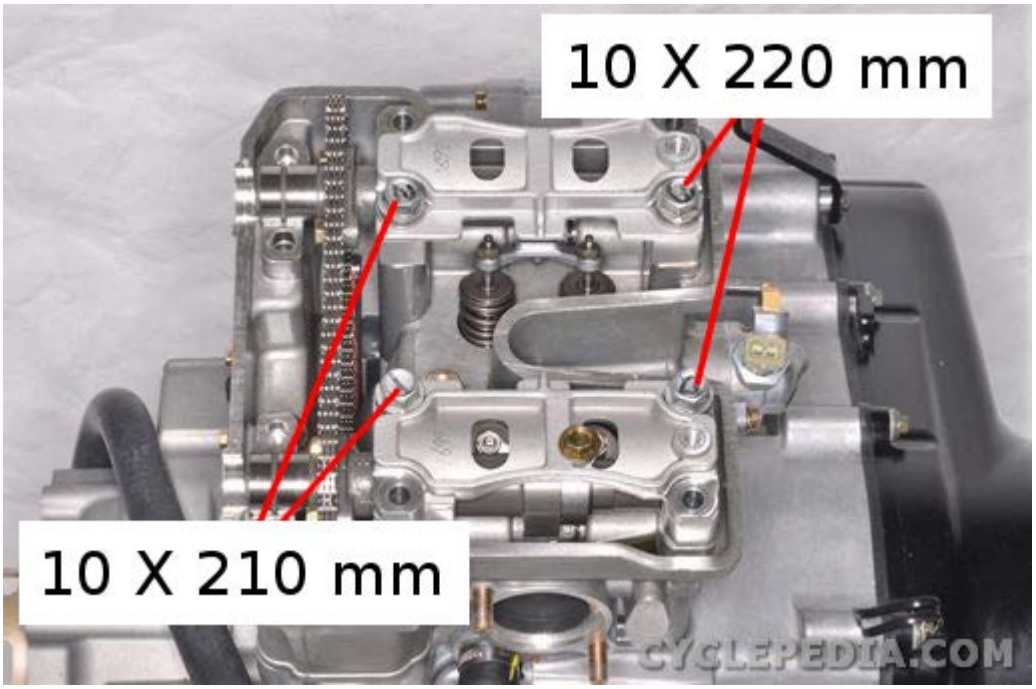
Install the exhaust camshaft holder with he two dowel pins. Note the exhaust camshaft holder has the stopper pin.



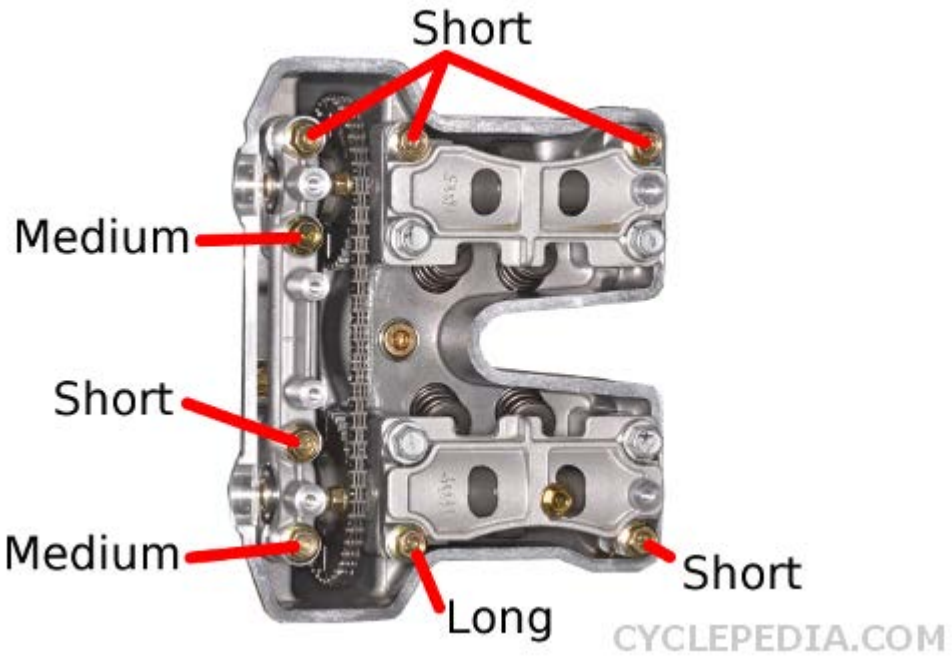
Fit the intake camshaft holder into place with the two dowel pins.

Lubricate the threads of the camshaft holder bolts with fresh engine oil.

Insert the four largest camshaft holder bolts with new washers.

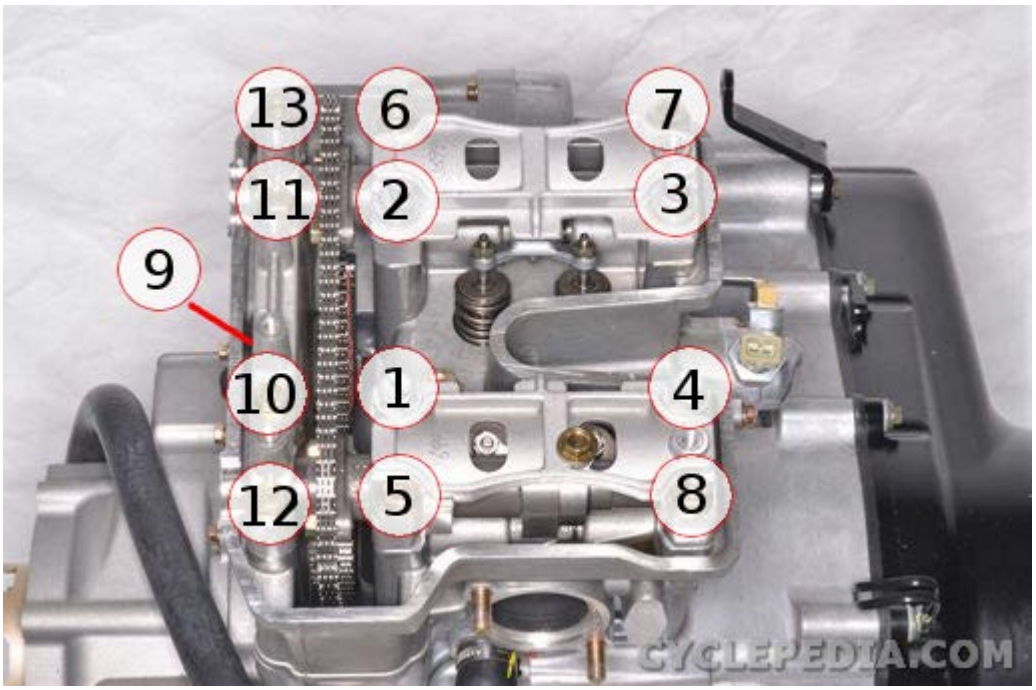


Position the four large cylinder head bolts as shown.



Insert the intake and exhaust camshaft holder bolts. Wait to install the cam chain side camshaft holder and bolts.

Long: 8 X 210 mm
Medium: 8 X 137 mm
Short: 8 X 71 mm

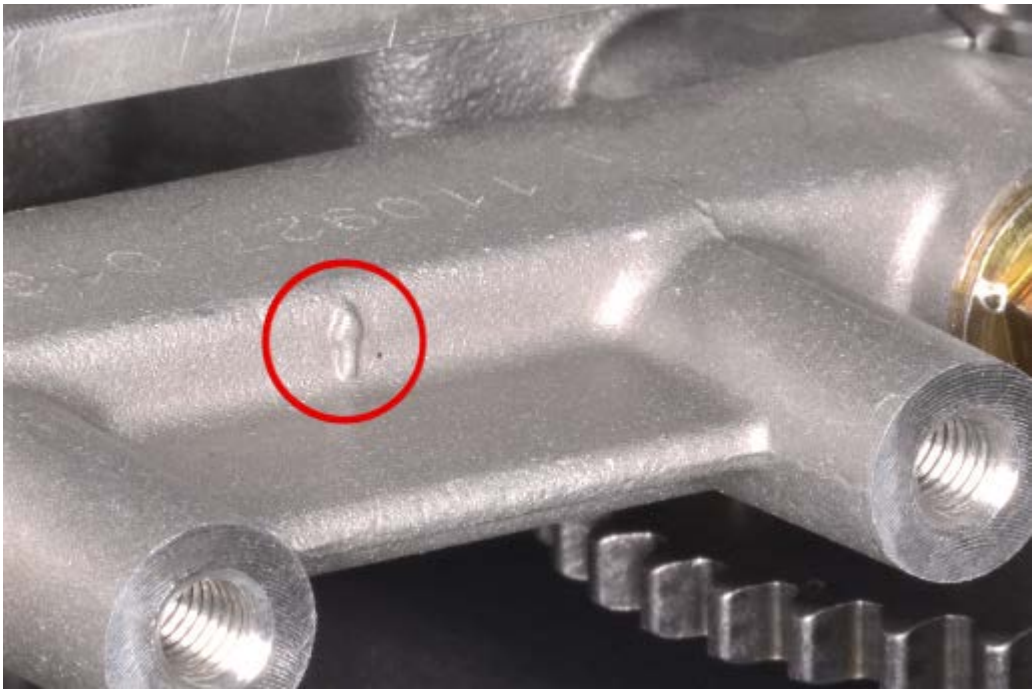


Tighten the bolts 1 - 9 in multiple steps in a crisscross pattern as shown below. Tighten the large bolts with a 14 mm socket and the smaller bolts with a 12 mm socket.

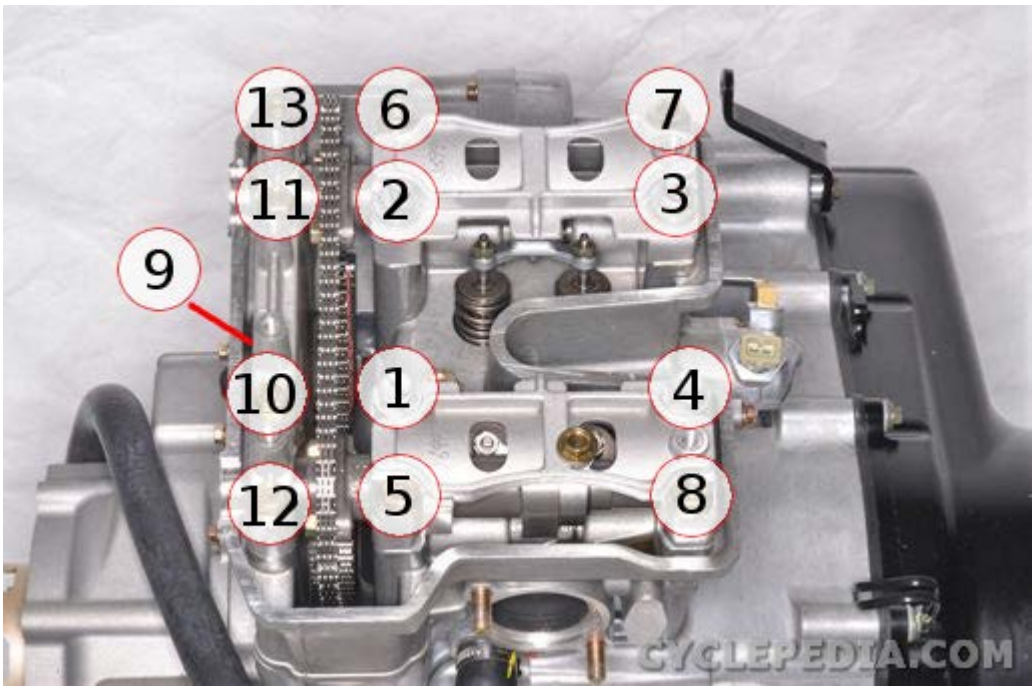
Camshaft Holder / Cylinder Head Bolt Torque kgf-m (N-m, ft-lb)			
Bolts	1, 2, 3, 4	5, 6, 7, 8, 9	10, 11, 12, 13
Step 1	2.4 (24, 17)	1.2 (12, 9)	
Step 2	3.8 (38, 27)	2.3 (23, 17)	
Step 3	4.8 (48, 35)		
Step 4			1.2 (12, 9)
Step 5			2.3 (23, 17)

The cylinder head bolt is number 9.

Fit the cam chain side camshaft holder into place.



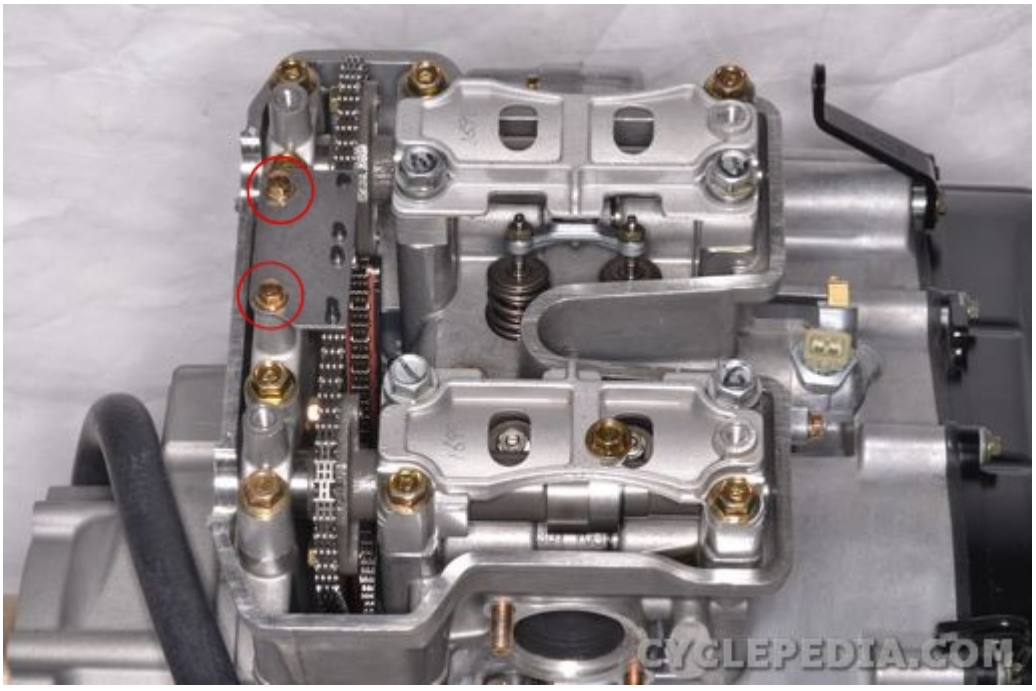
The arrow on the camshaft holder must face out.



Tighten the 10 - 13 bolts to specification with a 12 mm socket in multiple steps as indicated.

Camshaft Holder / Cylinder Head Bolt Torque kgf-m (N-m, ft-lb)	
Bolts	10, 11, 12, 13
Step 4	1.2 (12, 9)
Step 5	2.3 (23, 17)

Fit the upper cam chain guide into place.



Install the two cam chain guide bolts and tighten them securely with an 8 mm socket.

Cam Chain Tensioner

Make sure the cam chain tensioner mating surface is clean. Install a new gasket with the cam chain tensioner.

Use a small flat blade screwdriver to wind in the cam chain tensioner rod. Hold the screwdriver in place until both tensioner mounting bolts have been installed.

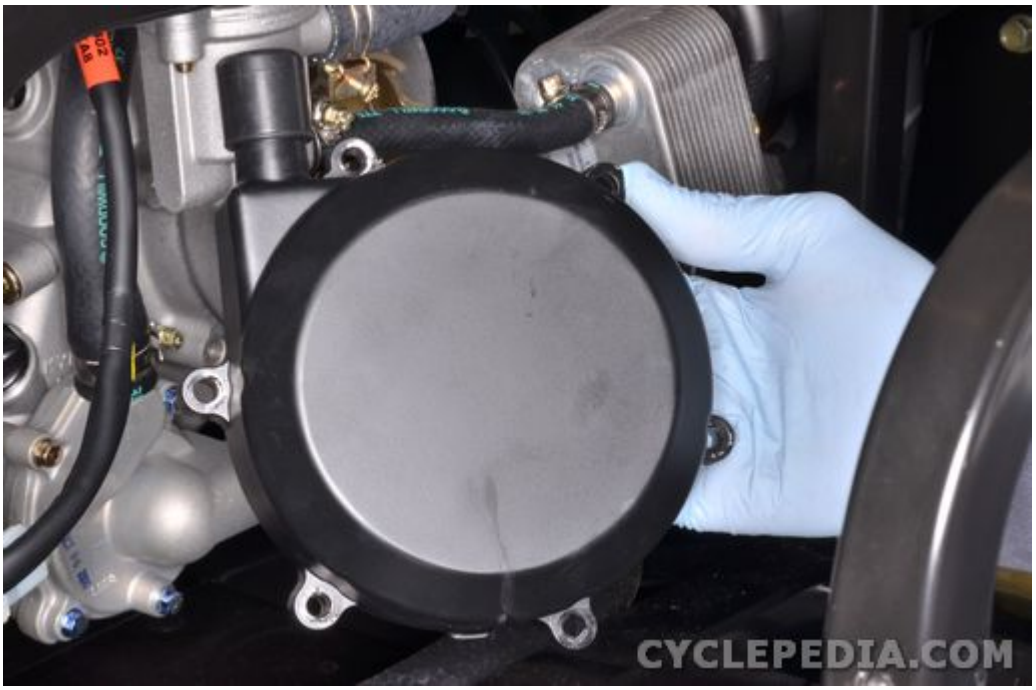
Install the two cam chain tensioner mounting bolts and tighten them to specification with an 8 mm socket. Install a new O-ring.

Item	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)
Cam chain tensioner bolt	6	1.2 (12, 8.6)

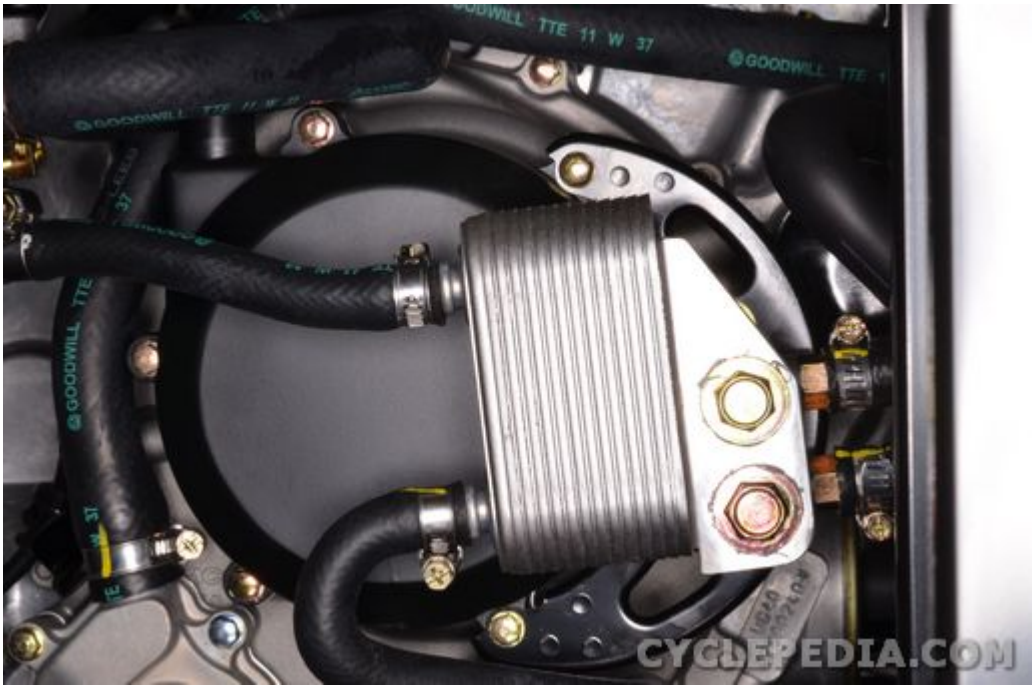
Install the cam chain tensioner sealing bolt and tighten it to specification with a 10 mm socket.

Item	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)
Tensioner sealing bolt	10	1 (10, 7.2)

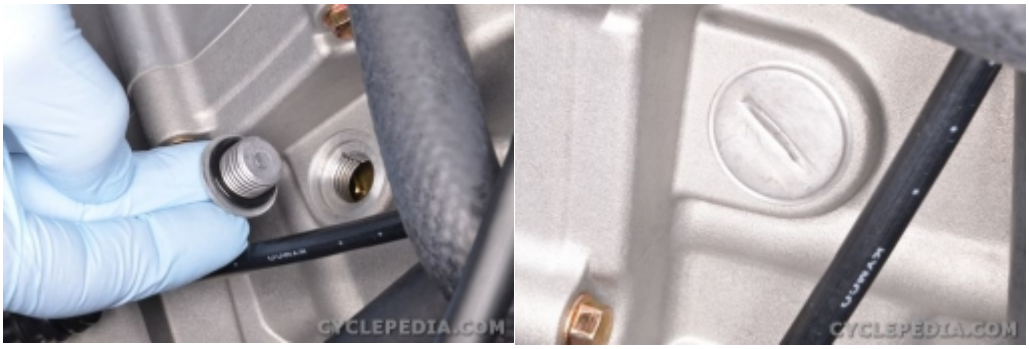
Adjust the valve clearance. See the Valve Adjustment topic for more information.



Install the recoil starter cover.



Tighten the recoil starter bolts securely with an 8 mm socket.



Install the timing cap on the right side of the engine and tighten securely with a flat blade screwdriver.

Install the cylinder head cover. See the Cylinder Head Cover topic for more information.

Cylinder Head

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Drain the coolant. See the Coolant topic for more information.

Remove the exhaust system. See the Exhaust System topic for more information.

Remove the cylinder head cover. See the Cylinder Head Cover topic for more information.

Remove the camshafts. See the Camshaft topic for more information.

Remove the throttle body. See the Throttle Body Removal and Installation topic for more information.

Push in the spring and unplug the WTS sensor connector.

Squeeze the clamp on the air bleed hose and slide it back. Loosen the thermostat hose clamp with a #2 Phillips screwdriver. Free the air bleed hose and thermostat hose from the WTS housing.

To remove the WTS housing remove the two bolts with an 8 mm socket.

Remove the WTS housing and cylinder head coolant stopper from the cylinder head. Discard the WTS housing gasket.

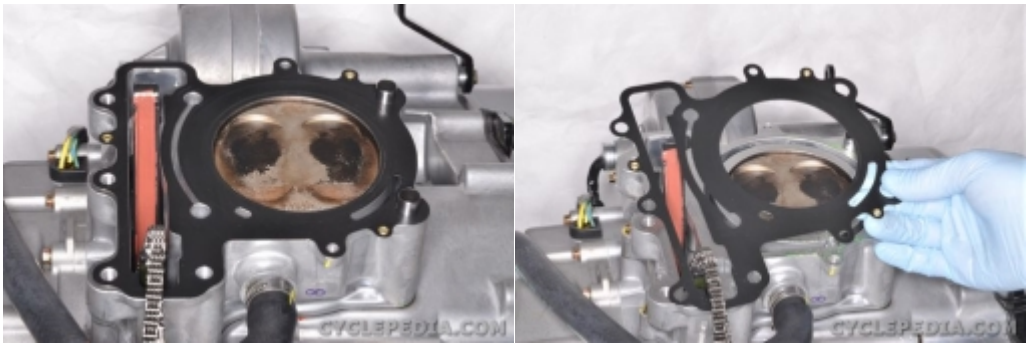
Remove the two nuts under the cylinder head with a 10 mm socket.

Loosen the cylinder head bolt with a 12 mm socket.

Remove the cylinder head bolt.

Tap the reinforced areas of the cylinder head with a rubber mallet to free the dowel pins.

Lift off the cylinder head. Guide the cam chain through the opening, but do not allow it to fall into the bottom end of the engine.



Remove the cylinder head gasket.

Remove the two cylinder head dowel pins.

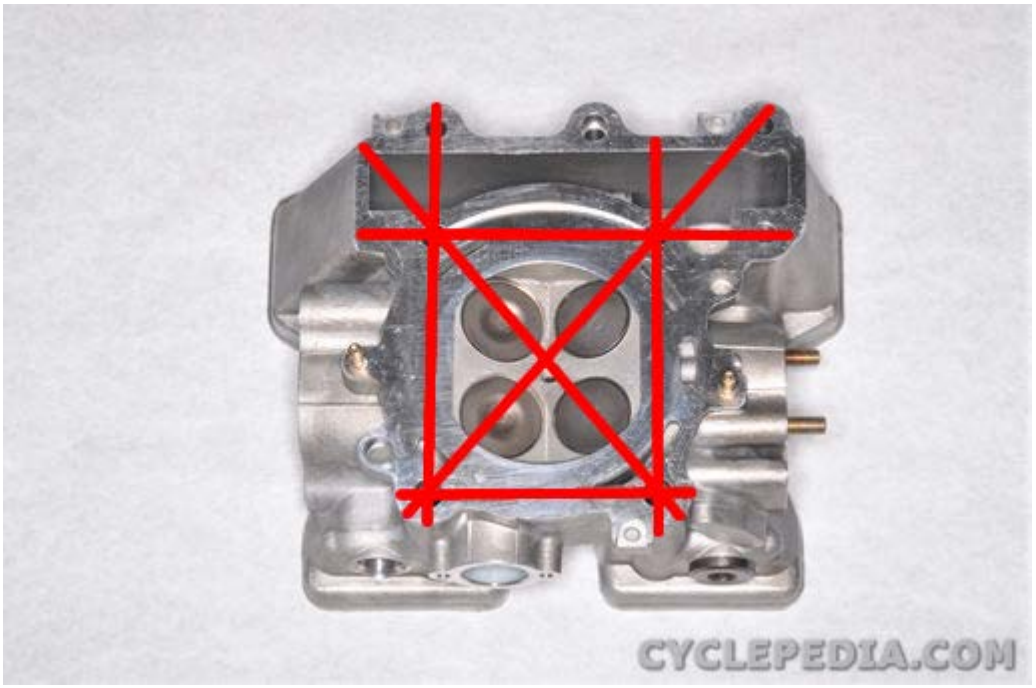
To remove the valves see the Valves topic.

Inspection

Clean the combustion chamber with contact cleaner, a plastic knife, brush and/or rag. Take care to only remove carbon and not scrape the head.

Place a straight edge on the deck of the cylinder head and check for cylinder head warp with a feeler gauge.

Cylinder head warpage limit	0.05 mm (0.002 in)

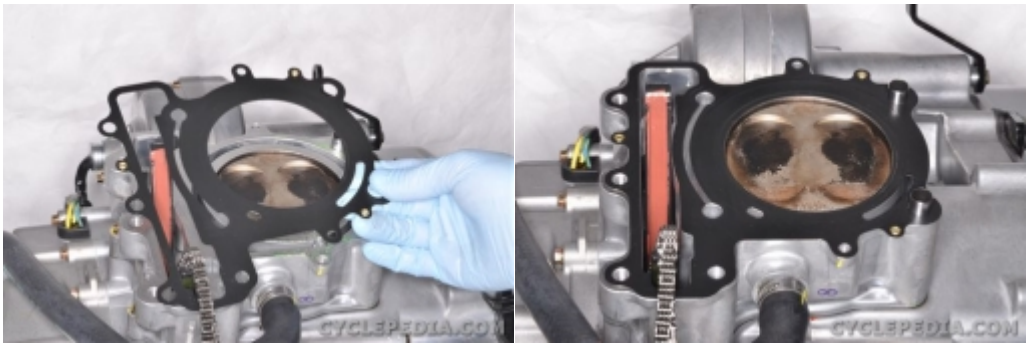


Check for warp in several places on the head. If the cylinder head is warped it must be resurfaced by a qualified machine shop or replaced.

Installation

Make sure the cylinder head mating surface is clean.

Install the two cylinder head dowel pins.



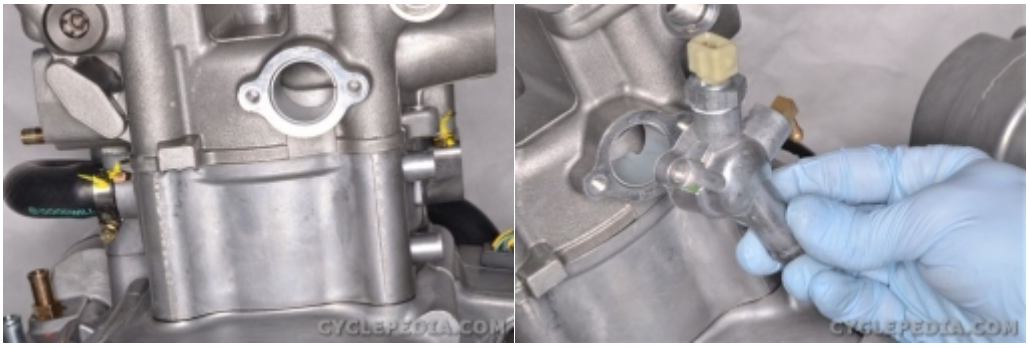
Fit a new cylinder head gasket into place.

Install the cylinder head to the cylinder. Guide the cam chain and cam chain guides though the opening in the cylinder head. Remember to keep the cam chain from falling into the bottom end of the engine.

Install the two nuts under the cylinder head with a 10 mm socket.

Item	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)
Cylinder head nut	6	1 (10, 7.4)

Install the cylinder head bolt. Wait to tighten it in sequence with the cylinder head / camshaft holder bolts.



Insert the coolant stopper into the cylinder head if it was removed. Install the WTS housing with a new gasket.

Install the two WTS housing bolts and tighten them to specification with an 8 mm socket.

Item	Thread dia. (mm)	Torque kgf-m (N-m, ft-lb)
WTS Housing bolt	6	1.2 (12, 8.6)

Install the camshaft. See the Camshaft Installation topic for more information.

Install the cylinder head cover. See the Cylinder Head Cover topic for more information.

Connect the air bleed hose and thermostat hose to the WTS housing. Secure the hoses with the clamps.

Plug in the WTS sensor connector.

Install the throttle body. See the Throttle Body Removal and Installation topic for more information.

Install the exhaust system. See the Exhaust System topic for more information.

Fill the coolant. See the Coolant topic for more information.

Valves

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

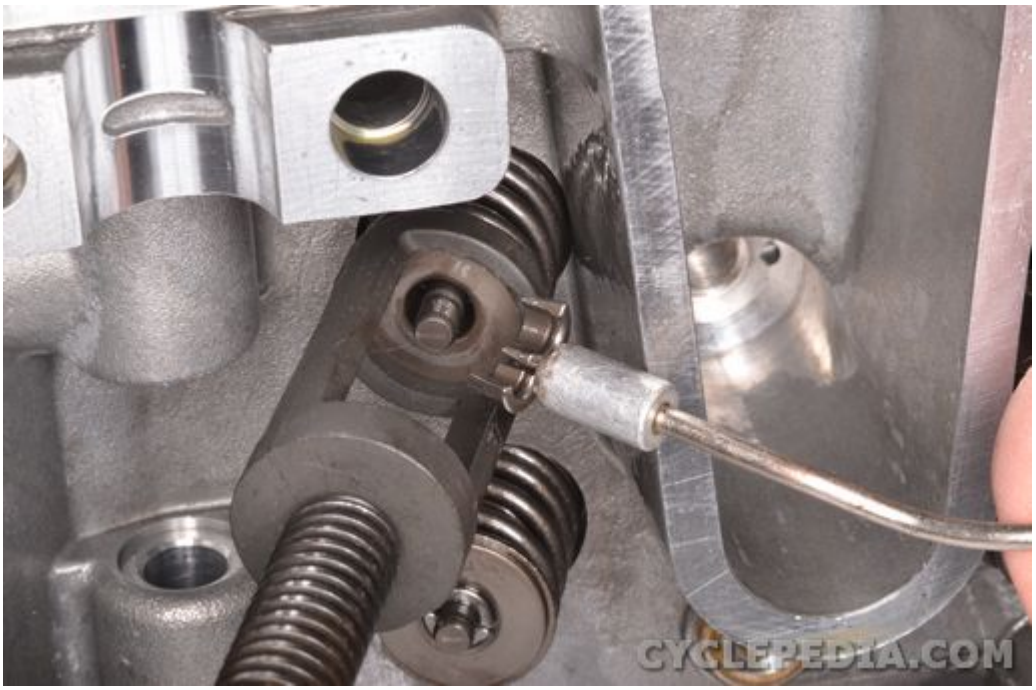
Remove the cylinder head. See the Cylinder Head topic for more information.

Note the location of all of the valve parts so that they can be returned to their original positions. Remove all of the valves in the same manner.

Use a valve spring compressor to remove the valves.

Special Tools- Valve Spring Compressor: A120E00040

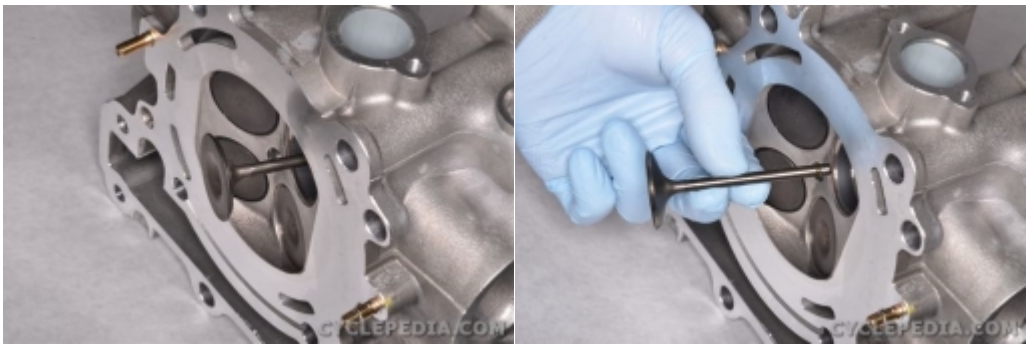
Compress the valve springs only enough to remove the cotters.



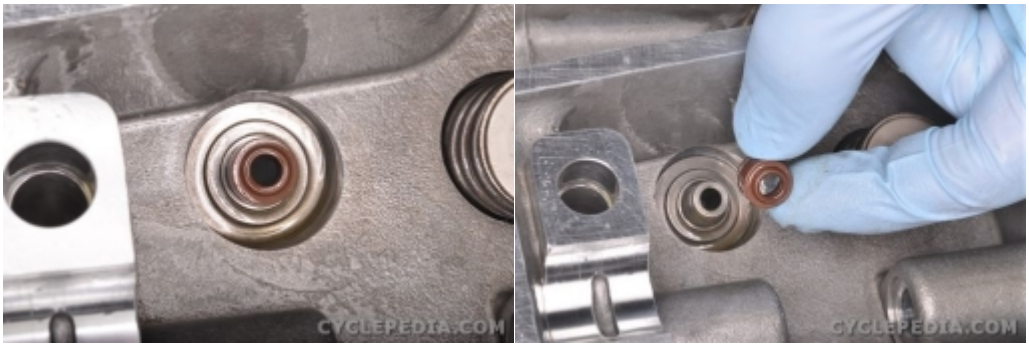
Remove the cotters from the valve stem with tweezers or a magnet.

Remove the spring retainers.

Lift out the valve springs.



Push the valves out through the bottom of the cylinder head.



Remove the stem seals with needle nose pliers and a pick. Discard the old stem seals.

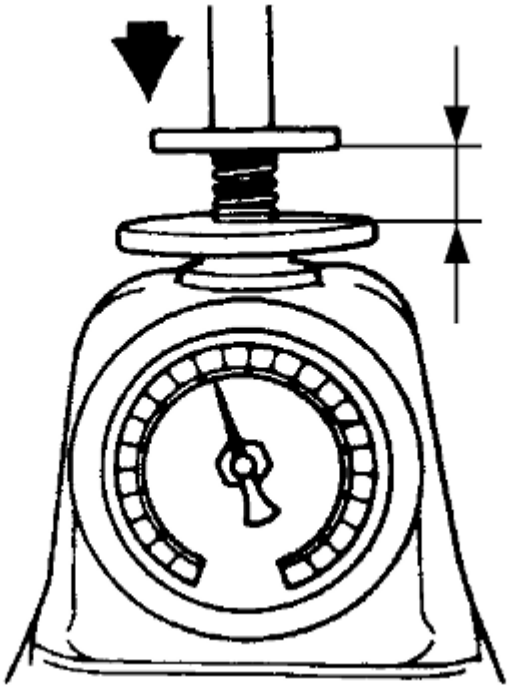
Remove the spring seats.

Inspection

Item		Standard mm (in)	Service Limit
Inner valve spring free length		-	33.4 (1.336)
Outer valve spring free length		-	38 (1.52)
Valve stem O.D.	IN	4.975 - 4.99 (0.199 - 0.1996)	4.925 (0.197)
	EX	4.955 - 4.97 (0.1982 - 0.1988)	4.915 (0.1966)
Valve guide I.D.	IN	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
	EX	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	0.08 (0.0032)
	EX	0.03 - 0.057 (0.0012 - 0.0023)	0.1 (0.004)

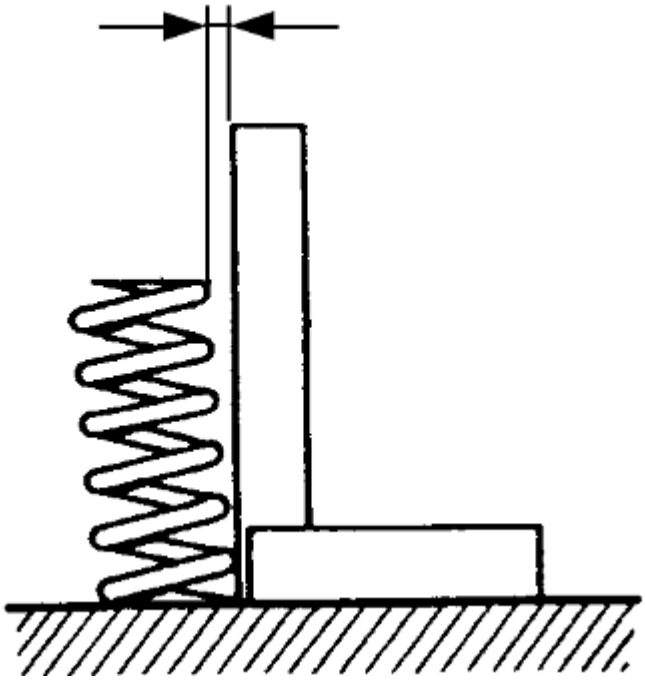
Measure the free length of the valve springs with vernier calipers. Replace the valve springs if they are below the service limit.

Item	Standard mm (in)	Service Limit
Inner valve spring free length	-	33.4 (1.336)
Outer valve spring free length	-	38 (1.52)



Measure the force to compress the valve spring with a scale. Replace the valve spring if it is out of specification.

Item	Standard
Inner valve spring compressed force	3.5 kg (@ 28.7 mm or 1.148 in)
Outer valve spring compressed force	13 kg (@ 31.43 mm or 1.2572 in)

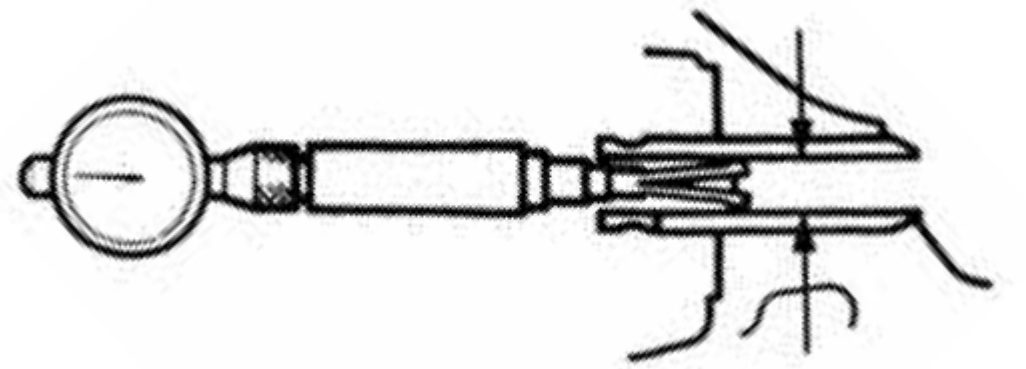


Check the valve spring for tilt. Replace the valve spring if it is out of specification.

Item	Standard mm (in)
Inner valve spring tilt	1.2 mm (0.048)
Outer valve spring tilt	1.2 mm (0.048)

Inspect the valve for damage. Measure the valve stem diameter with a micrometer or vernier calipers and compare the measurements with specification. Replace any valves that do not meet the standard.

Item		Standard mm (in)	Service Limit
Valve stem O.D.	IN	4.975 - 4.99 (0.199 - 0.1996)	4.925 (0.197)
	EX	4.955 - 4.97 (0.1982 - 0.1988)	4.915 (0.1966)



Measure the inside diameter of the valve guides. Replace the guides if the measurement is out of specification. Calculate the valve stem-to-guide clearance. Replace the guide and valve if the clearance is out of specification.

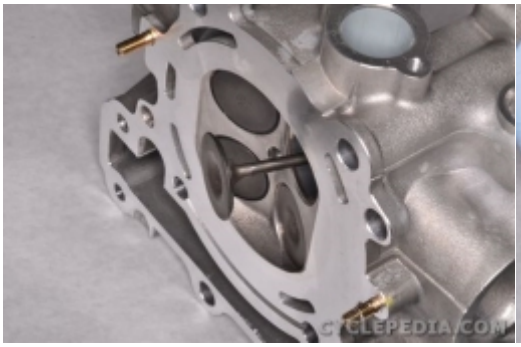
Item		Standard mm (in)	Service Limit
Valve guide I.D.	IN	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
	EX	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	0.08 (0.0032)
	EX	0.03 - 0.057 (0.0012 - 0.0023)	0.1 (0.004)

Replace the cylinder head if the valve guides are out of specification.

Assembly

Install the spring seats.

Lubricate the new valve stem seals with fresh engine oil. Install new valve stem seals. Push the seals straight onto the guide.



Coat the valve stem and end in fresh engine oil. Insert the valve through the valve guide. Twist the valve slowly to work it through the stem seal without damaging the seal. The valve should move smoothly in the guide and make good contact with the seat.

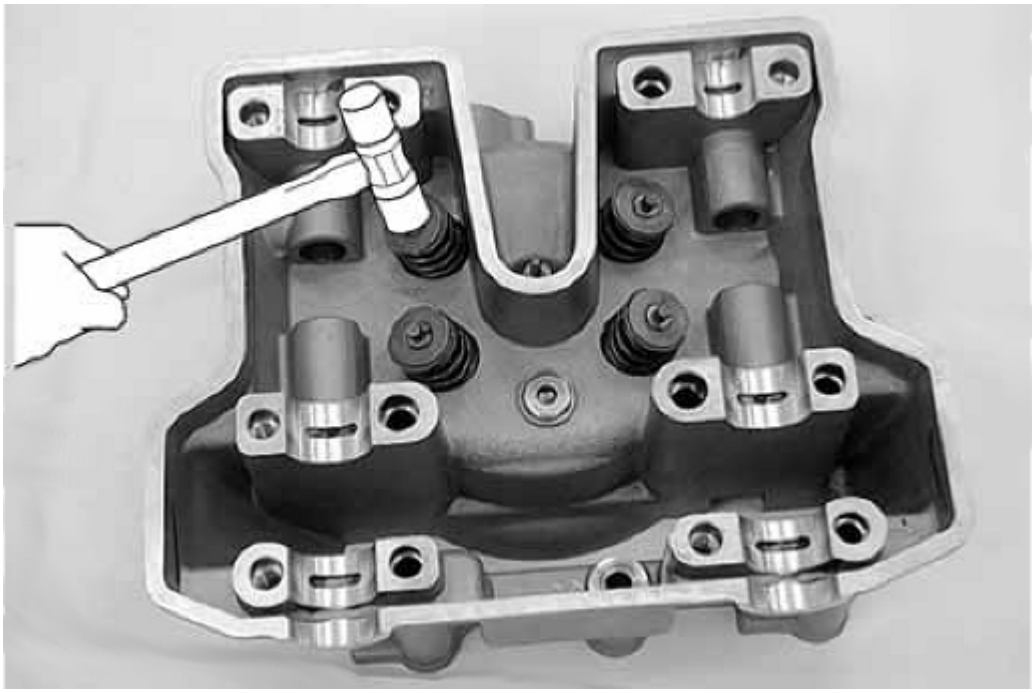
Install the valve springs with the tightly spaced coils facing down.

Install the spring retainers to their original locations.

Use a valve spring compressor to install the cotters. Compress the valve springs only enough to install the cotters.

Special Tools- Valve Spring Compressor: A120E00040

Apply grease to the inside of the cotters. Apply a dab of grease to the end of a flat blade screwdriver. Set the keeper in the grease on the screwdriver and insert it onto the valve stem. Repeat this with the other keeper.



After the valves have been reassemble place a clean shop towel under the cylinder head in the combustion chamber area and gently tap each valve with a plastic rod and rubber mallet to make sure the valves and cotters are seated properly.

Cylinder and Piston

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the cylinder head. See the Cylinder Head topic for more information.

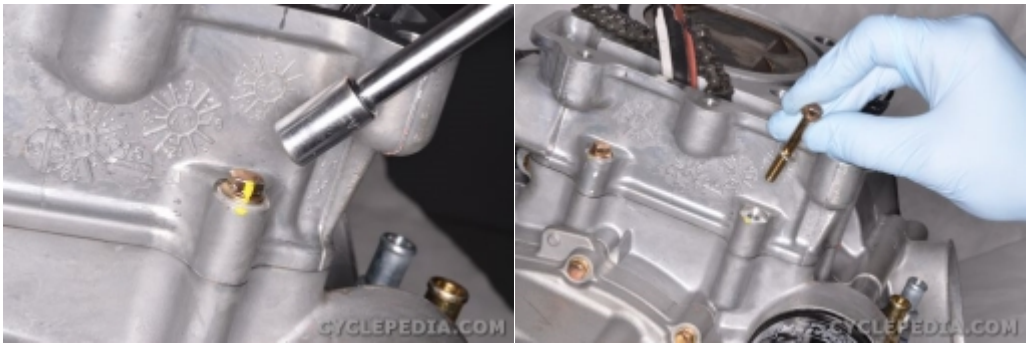
A coolant hose connects the cylinder cooling jacket to the water pump.

Loosen the cylinder coolant hose clamp with a #2 Phillips screwdriver. Free the coolant hose from the cylinder.

There is a coolant block pin located in the cooling jacket of the cylinder.

Remove the block pin from the cylinder.

There are two cylinder bolts with washers on the cam chain side of the cylinder.



Loosen the two cylinder bolts with an 8 mm socket. Remove the cylinder bolts and washers.

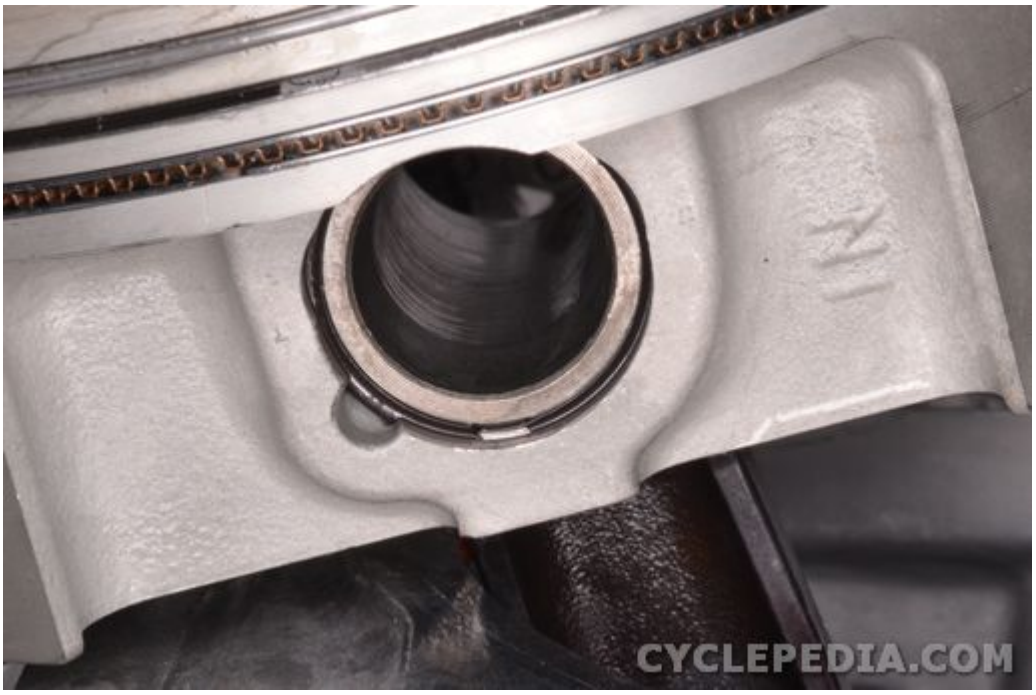
Gently tap the cylinder to free it from the crankcases.

Lift the cylinder up and off of the crankcases. Guide the cam chain through its opening in the cylinder. Make sure the cam chain and dowel pins do not fall into the bottom end of the engine.

Lift off the base gasket.

Remove the two dowel pins.

Place a clean shop towel around the base of the piston to prevent any parts or debris from falling into the crankcase.



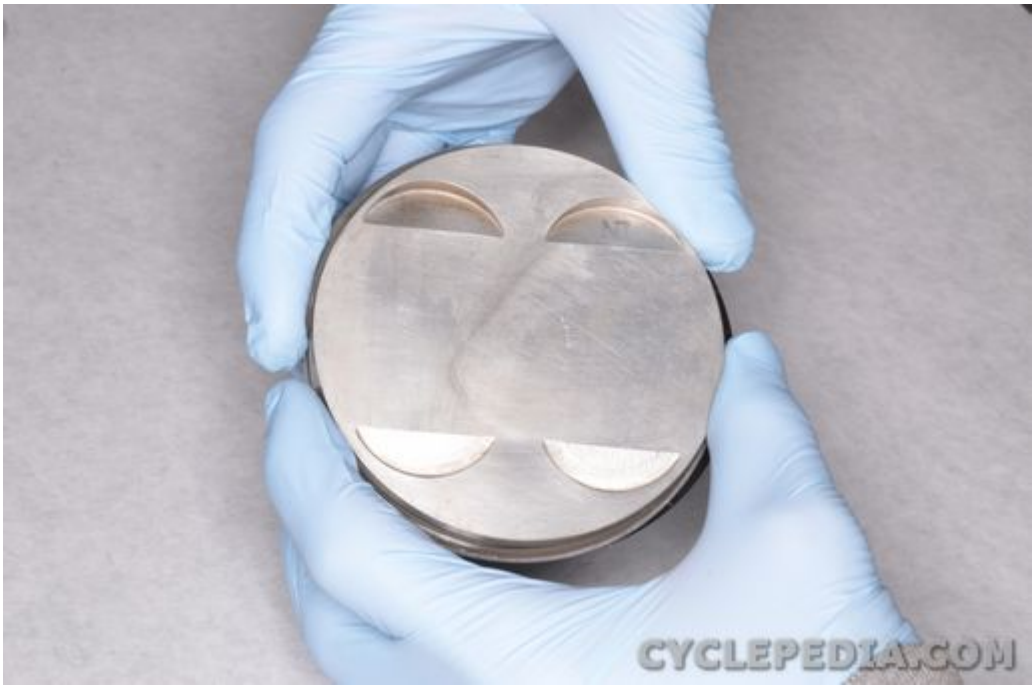
Rotate the gap in the piston pin clip so that it sits in the access opening in the piston.

Remove the piston pin clip with a pick or needle nose pliers. Discard the piston pin clips.

Slide out the piston pin. Do not use a punch and a hammer to remove the pin.

Remove the piston. Clean off the cylinder mating surface, but take care to keep debris from falling into the crankcase.

Clean the carbon build up off of the piston with a stiff bristled plastic brush. Never use a wire brush to clean a piston.

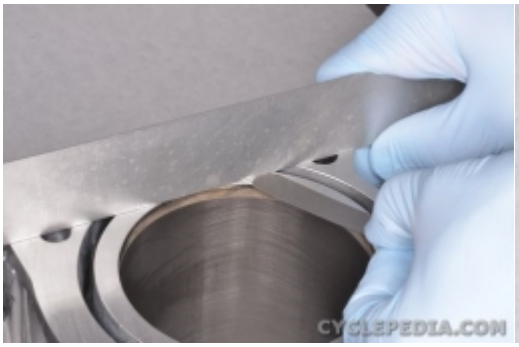


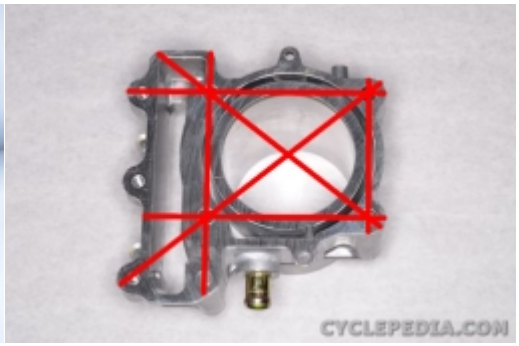
Spread the piston rings and lift them off opposite the gap. Spread the rings the minimum amount during removal. The rings can be easily damaged.

Clean out the ring grooves. You can use an old ring to scrape out any built up carbon in the grooves.

Inspection

Cylinder Warp



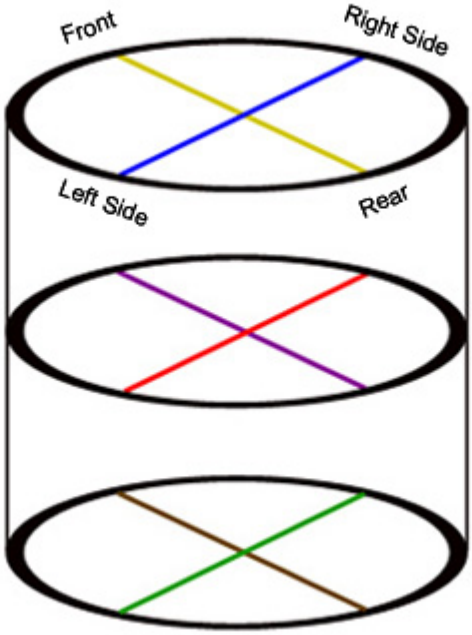


Test for cylinder warp with a straight edge and a feeler gauge. Try and insert the feeler gauge of the service limit under the straight edge. Place the straight edge in several places on the cylinder.

Item	Service Limit
Cylinder warpage across top	0.05 mm (0.002 in)

Cylinder Bore

Inspect the cylinder and measure side to side at three different height levels with a dial bore gauge or cylinder gauge set.

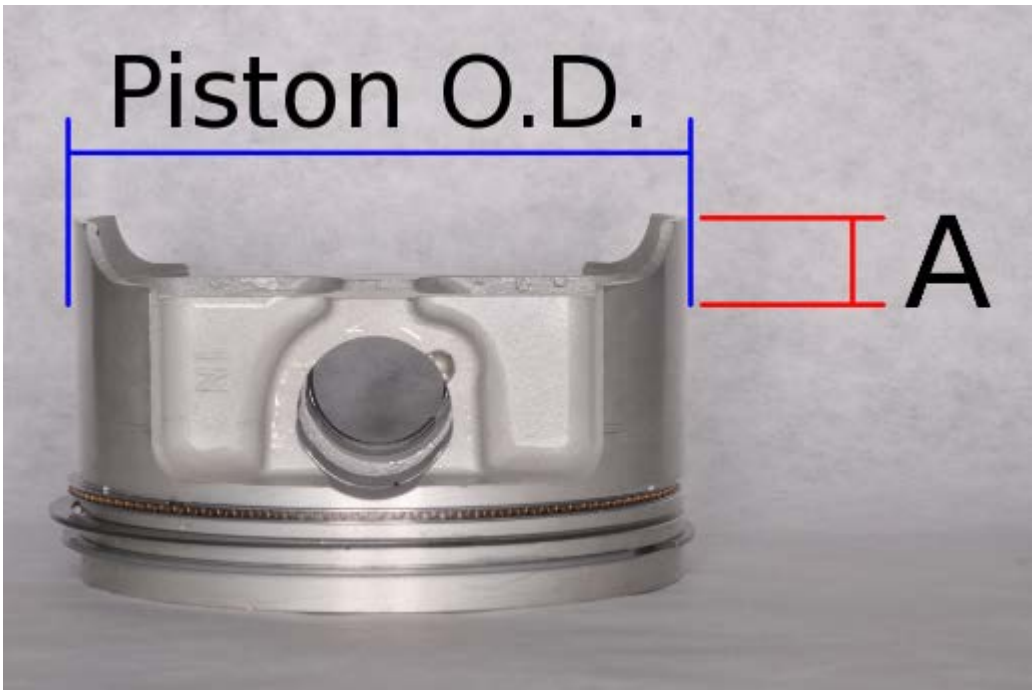


Calculate the cylinder taper. The taper is the maximum difference between either yellow and brown or blue and green. Calculate the cylinder out of round. The out of round is greatest out of yellow, purple, or brown minus the smallest of blue, red, or green.

Item		Standard	Service Limit
Cylinder	I.D.	92.005 - 92.015 (3.6802 - 3.6806)	92.1 (3.684)
	Warpage	0.01 (0.0004)	0.05 (0.002)
	Taper	0.01 (0.0004)	0.1 (0.004)
	Out-of-round	0.01 (0.0004)	0.1 (0.004)

If the cylinder is out of specification or damaged it should be repaired by a qualified machine shop or replaced.

Piston Diameter



Measure the diameter of the piston 10 mm (A) up from the bottom of the skirt at a 90° angle to the piston pin. Measure the piston with a micrometer. Replace the piston if the measurement is out of specification. Check the piston for wear and extreme discoloration.

ITEM	STANDARD mm (in)	LIMIT
Piston diameter	91.96 - 91.98 (3.6784 - 3.6793)	91.9 (3.676)
Piston O.D. measuring position	10 mm from bottom of the skirt	-

Piston-to-Cylinder Clearance

Subtract the diameter of the piston from the maximum front to rear diameter measurement of the cylinder to calculate the piston-to-cylinder clearance. If the clearance is over the service limit the cylinder and piston must be replaced.

ITEM	STANDARD mm (in)	LIMIT
Piston-to-cylinder clearance	0.01 - 0.045 (0.0004 - 0.0018)	0.1 (0.004)

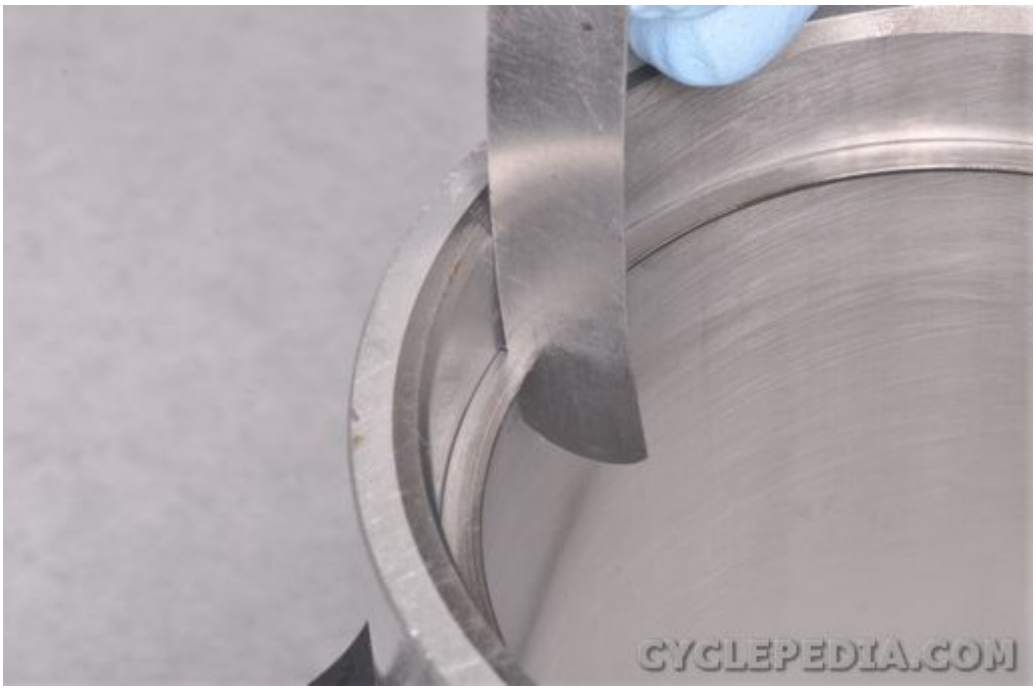
Piston Ring-to-Groove Clearance

Check the ring-to-groove clearance with a feeler gauge. Make sure the ring is in the correct grove.

ITEM		STANDARD mm (in)	LIMIT
Ring-to-groove clearance	Top	0.03 - 0.065 (0.0012 - 0.0026)	0.08 (0.003)
	Second	0.015 - 0.05 (0.0006 - 0.002)	0.065 (0.0026)

Piston Ring End Gap

Insert the top ring into the cylinder. Push the top ring in the cylinder. Use the piston to push in the ring to keep it square with the cylinder.



Measure the ring gap with a feeler gauge. Repeat this procedure with second ring.

ITEM		STANDARD mm (in)	LIMIT
Ring end gap	Top	0.15 - 0.3 (0.006 - 0.012)	0.5 (0.02)
	Second	0.03 - 0.45 (0.012 - 0.018)	0.65 (0.026)
	Oil side rail	0.2 - 0.7 (0.008 - 0.028)	1 (0.04)

Piston Pin O.D.

Measure the piston pin outside diameter with a micrometer.

Item	Standard	Service Limit
Piston pin O.D	21.994 - 22 (0.8798 - 0.88)	21.96 (0.8784)

Piston Pin Bore I.D.

Measure the piston pin bore diameter with vernier calipers or dial gauge with a small bore gauge.

Special Tools-
Dial Gauge (1/1000 mm, 1 mm): 09900-20602
Small Bore Gauge (18 - 35 mm): 09900-22403

Item	Standard	Service Limit
Piston pin hole I.D.	22.002 - 22.008 (0.8801 - 0.8803)	22.04 (0.8816)
Piston-to-piston pin clearance	0.002 - 0.014 (0.0001 - 0.0006)	0.02 (0.001)

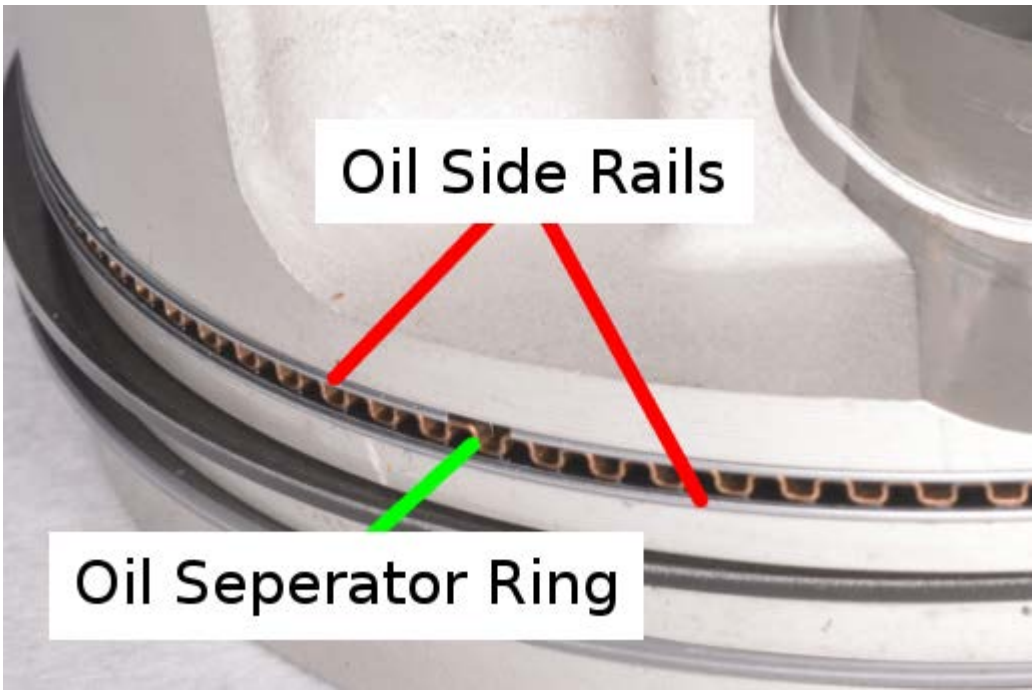
Connecting Rod Small End

Measure the inside diameter of the small end of the connecting rod.

Item	Standard	Service Limit
Connecting rod small end I.D. bore	22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

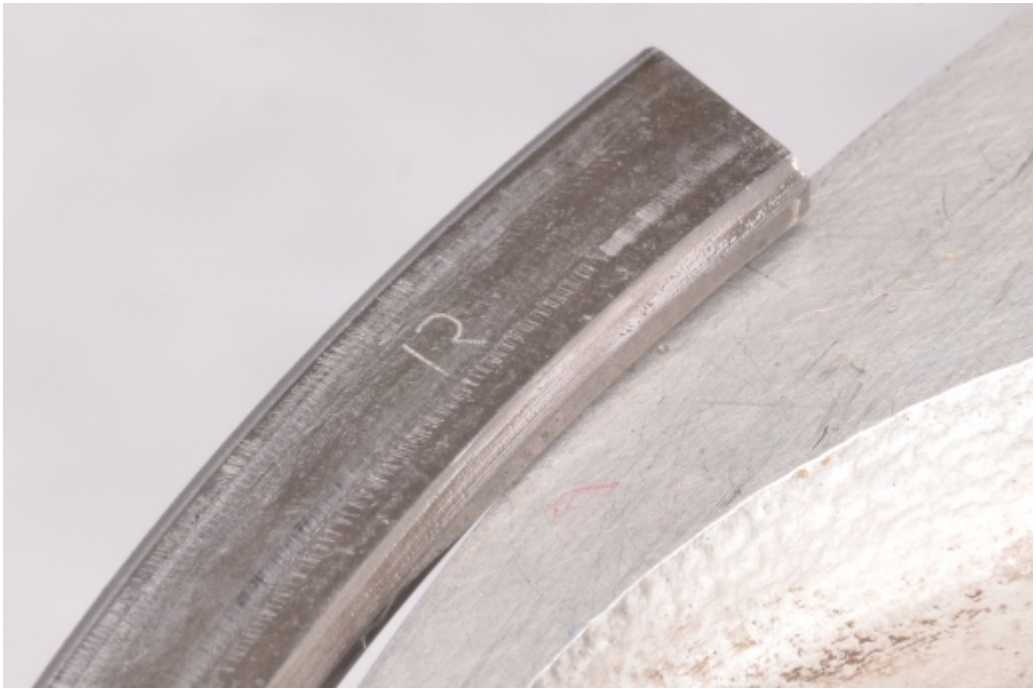
Assembly

Clean the piston ring grooves, and apply fresh engine oil to the piston rings. Spread the rings the minimum amount possible to install them.

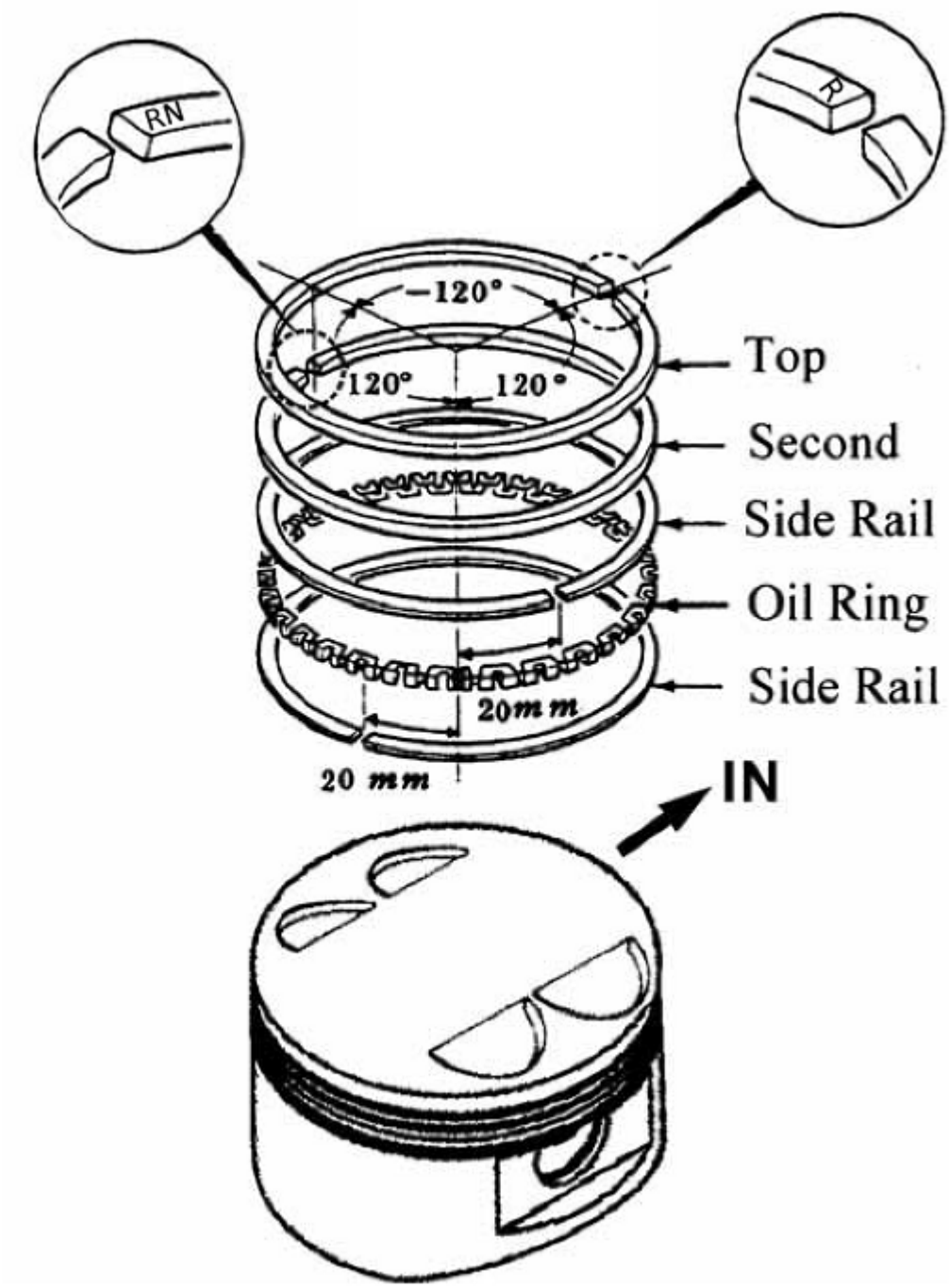


Install the oil ring first then the steel rails above and below the oil ring.

Install the second ring with the "RN" mark facing up.

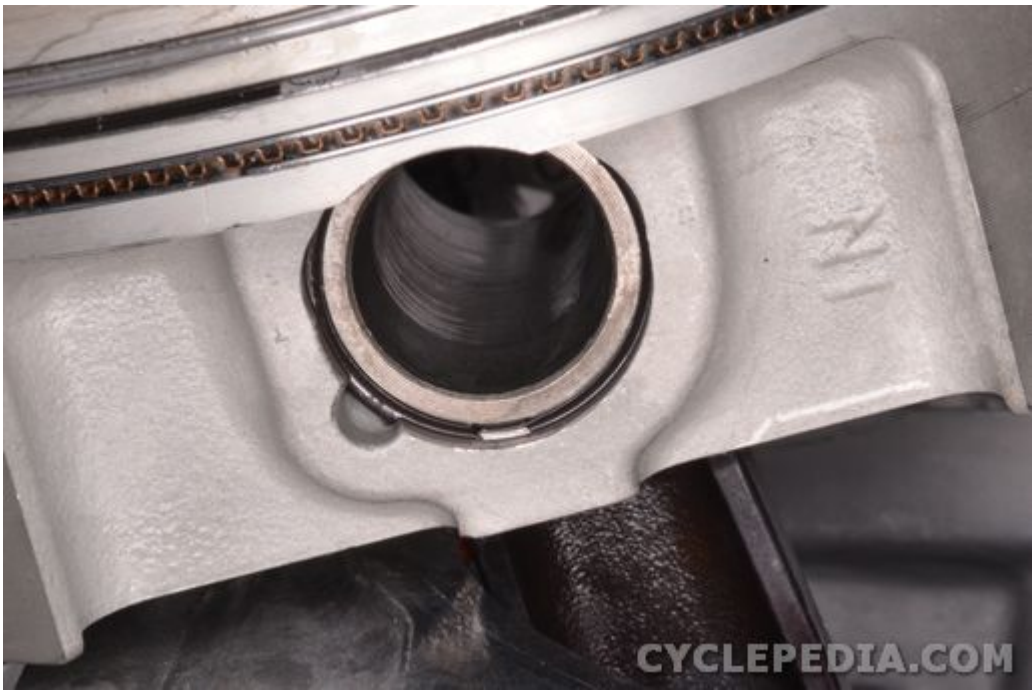


Install the top ring with the "R" mark facing up. The top ring's upper inside edge is chamfered.



The top, second, and oil rings should be rotated so that their gaps divide the piston into thirds, or 120° apart. The gaps shouldn't line up with the gaps of any of the other rings. Also, none of the ring gaps should line up with the piston pin.

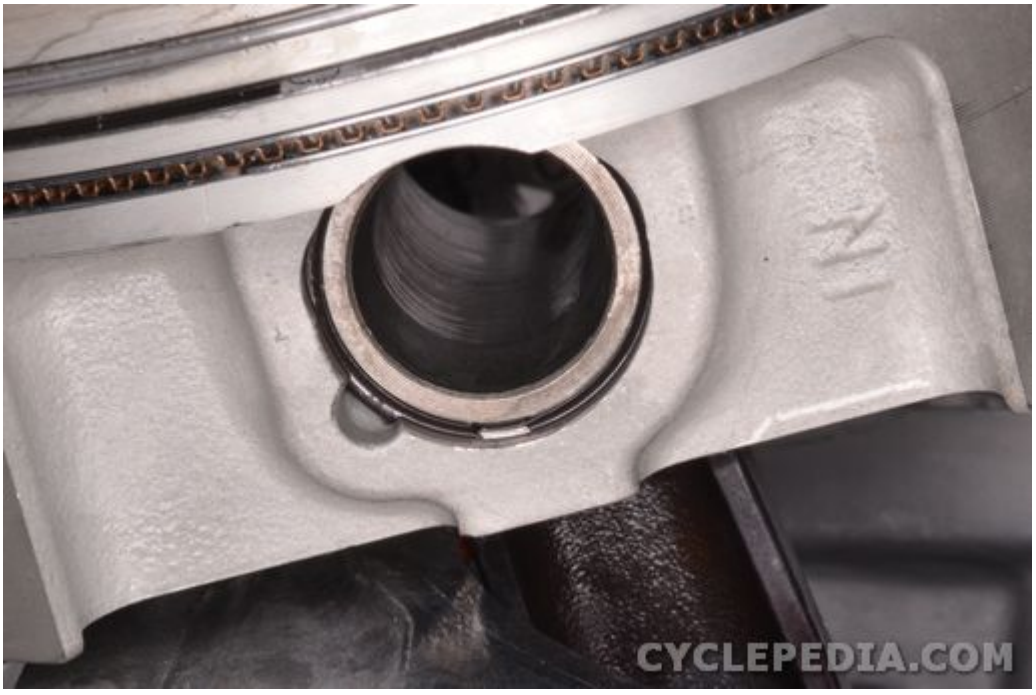
Lubricate the piston pin and the small end of the connecting rod with fresh engine oil.



Install the piston onto the connecting rod. The IN marks on the piston must sit on the intake side of the engine.

Insert the piston pin.

Place a clean shop towel around the base of the piston to prevent any parts or debris from falling into the crankcase. Install new piston pin clips securely into their grooves.



Turn the gap in the clips away from the access gap.

Make sure the cylinder mating area is clean. Install the two dowel pins.

Install the new base gasket.

Coat the inside of the cylinder, piston rings, and piston in fresh engine oil. Lower the cylinder into place and guide the piston into the cylinder while you are compressing the rings with your fingers. Be careful to not damage the rings during this step. Bring the cam chain and guides through the opening.

Note: If the crankshaft is rotated pull up on the cam chain to prevent it from being caught between the crankcase and the cam drive sprocket.

Install the two cylinder bolts and washers. Wait to tighten the bolts until the cylinder head and camshafts have been installed. Tighten the bolts to specification with an 8 mm socket.

ITEM	N-m	kgf-m	ft-lb
Cylinder base nut	10	1.0	7.0

Install the cooling block into the cooling jacket of the cylinder if it was removed.

Install the cylinder head. See the Cylinder Head topic.

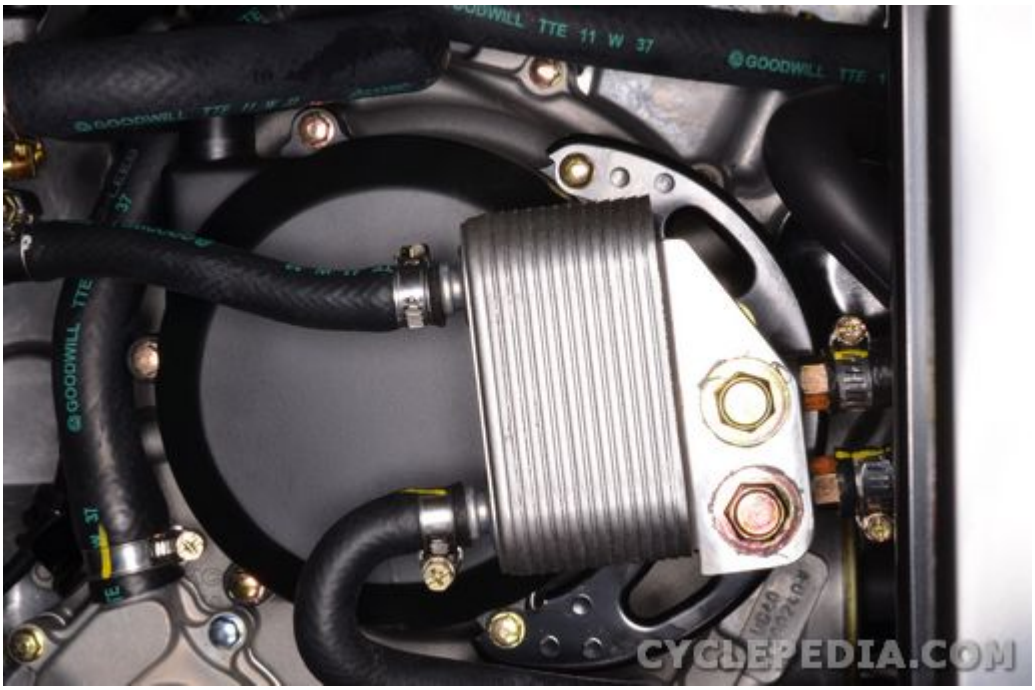
Recoil Starter Cover

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

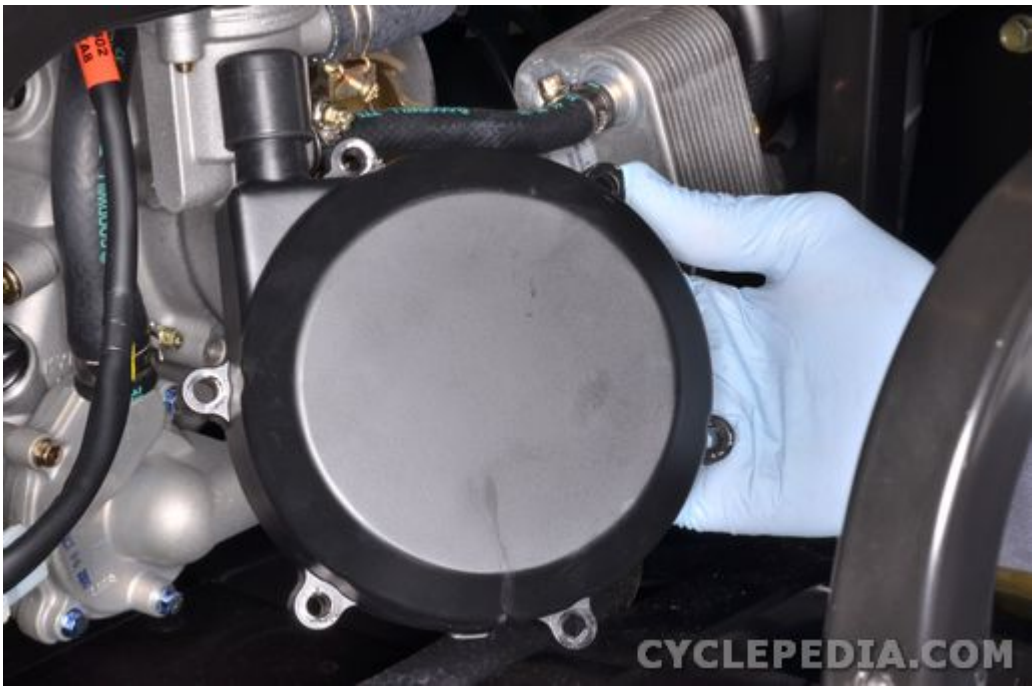
Note: The recoil starter mechanism is not installed.

Removal

Remove the right side cover and right mudguard. See the Side Covers and Mudguards and Footrests topics for more information.



Remove the recoil starter cover bolts with an 8 mm socket.



Remove the recoil starter cover.

Remove the belt case and hold the drive pulley to keep the crank from turning with a drive pulley holder. See the Belt Case Cover topic for more information.

Special Tool - Drive Pulley Holder: A120E00058

Loosen the recoil starter nut with a 19 mm socket.

Remove the recoil starter nut and washer.

Slide out the recoil starter drum. Be careful to not damage the oil control rings.

Inspect the recoil starter oil control rings.

To replace the oil control rings carefully unlock the rings and remove them.

Inspect the recoil starter bearing and seal. Remove the generator cover to replace the bearing and seal as needed. See the Generator Cover topic for more information.

Installation

Install the oil control rings to the recoil starter. Lock the rings as shown above. Apply fresh engine oil to the oil control rings and the recoil starter seal.

Carefully install the recoil starter so that the oil control rings are not damaged.

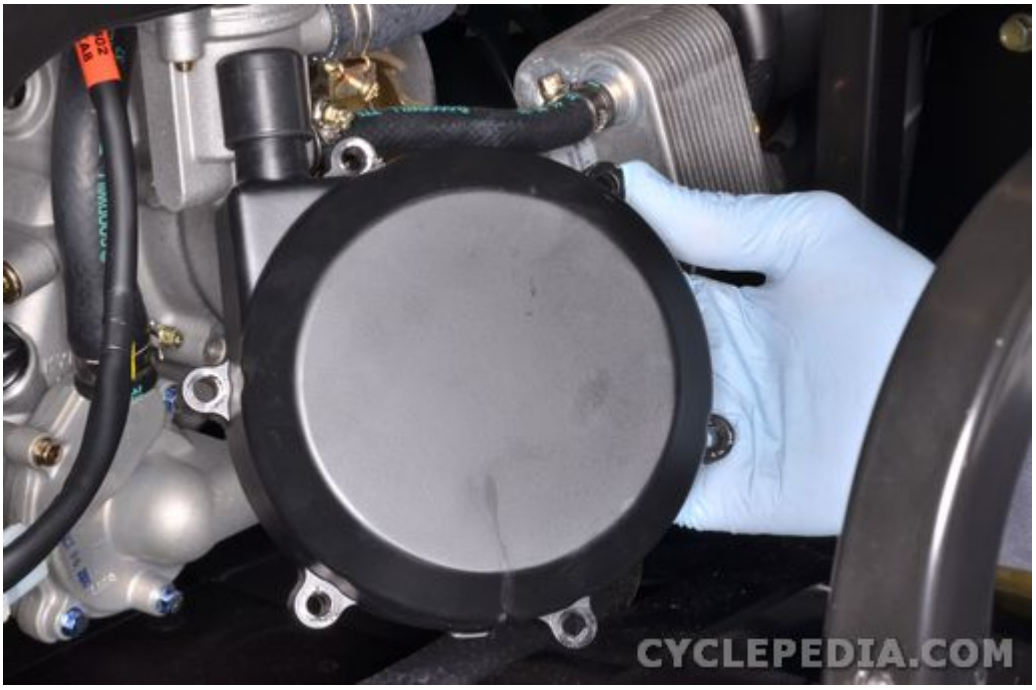
Install the washer and the recoil starter nut.

Hold the drive pulley to keep the crank from turning with a drive pulley holder.

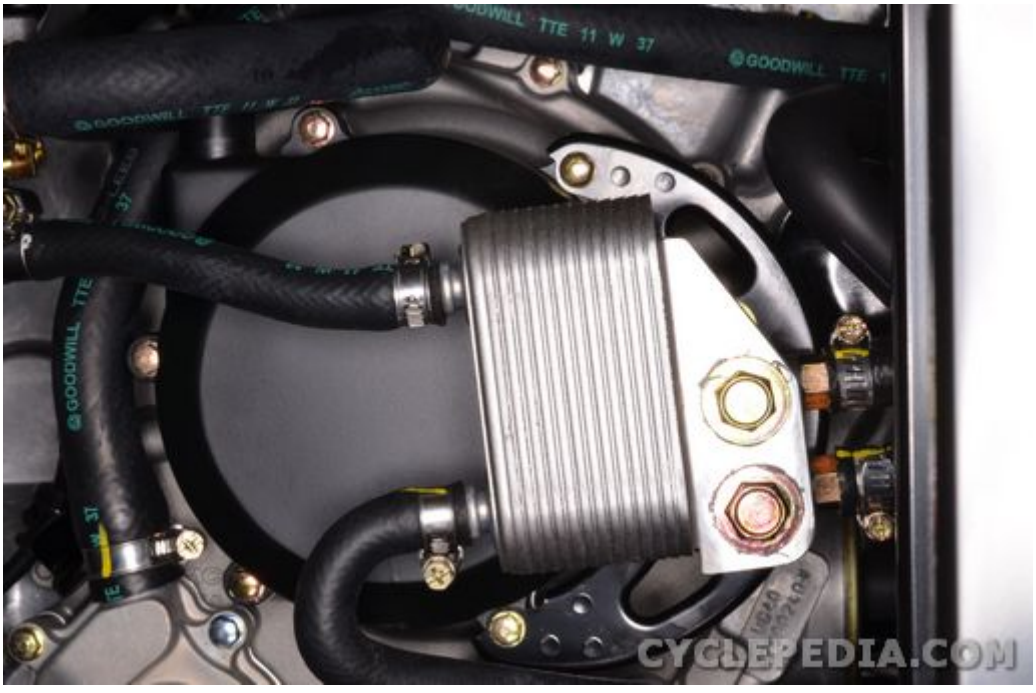
Special Tool - Drive Pulley Holder: A120E00058

Tighten the recoil starter nut to specification with a 19 mm socket.

ITEM	N-m	kgf-m	ft-lb
Recoil starter nut	55	5.5	40



Install the recoil starter cover.



Tighten the recoil starter bolts securely with an 8 mm socket.

Install the frame covers. See the Side Covers topic for more information.

Generator Cover

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Generator Cover

Remove the right side cover and right mudguard. See the Side Covers and Mudguards and Footrests topics for more information.

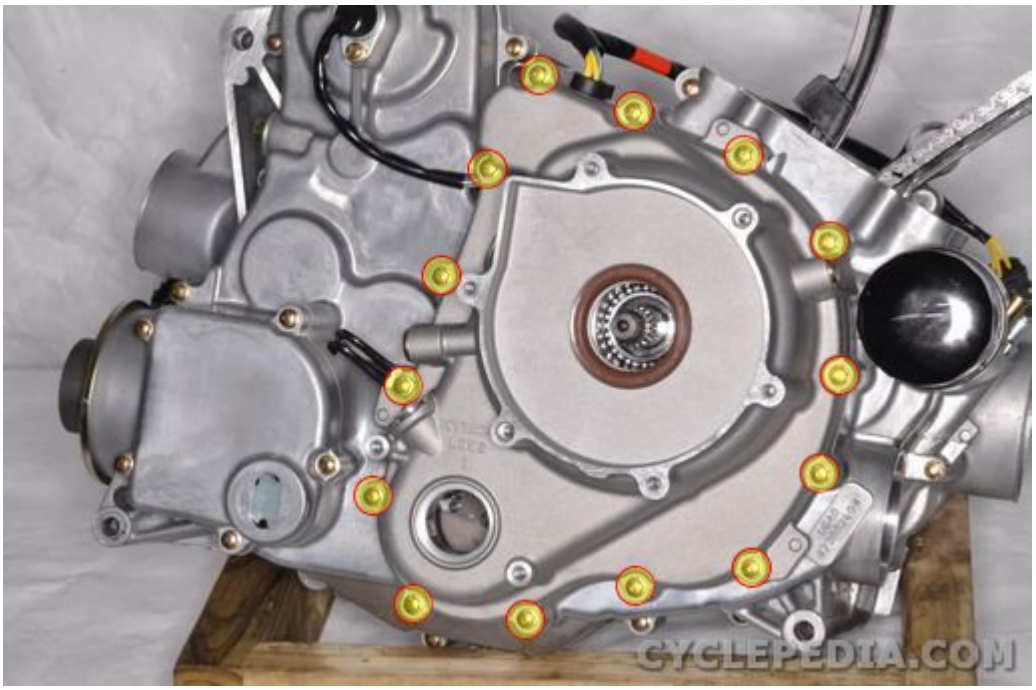
Drain the coolant. See the Coolant topic for more information.

Drain the engine oil if the water pump is to be removed. See the Engine Oil topic for more information.

Remove the water pump. See the Water Pump topic for more information.
Remove the recoil starter. See the Recoil Starter Cover topic for more information.
Trace the wires up from the generator cover.

Unplug the 2-pin ignition pulse generator / crank position sensor connector.

Unplug the 4-pin stator connector.



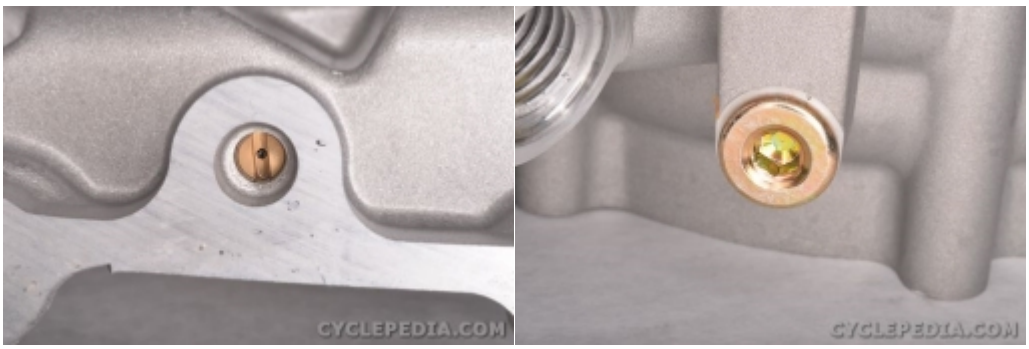
Loosen the 14 generator cover bolts evenly in a crisscross pattern.

Remove the 14 generator cover bolts with an 8 mm socket.

Utilize the pry points and remove the generator cover from the crankcase.

Remove the generator cover gasket.

Remove the two generator cover dowel pins.

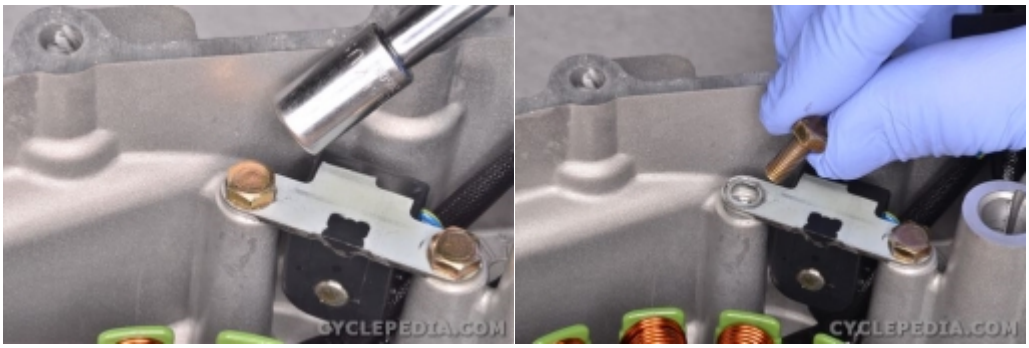


Inspect the oil jet and passages for clogging. Clean them out if needed.

Stator and Ignition Pulse Generator

The stator and ignition pulse generator must be removed together.

Remove the three stator coil mounting bolts with an 8 mm socket.



Remove the two ignition pulse generator bolts with an 8 mm socket.

Free the ignition pulse generator and rubber wire grommet from the generator cover.

Lift out the stator and ignition pulse generator together.

If the bearing in the generator cover needs to be replaced remove the snap ring. Drive the bearing out from the outside in. Drive in the new bearing with a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out. Install a new snap ring into the groove with snap ring pliers.

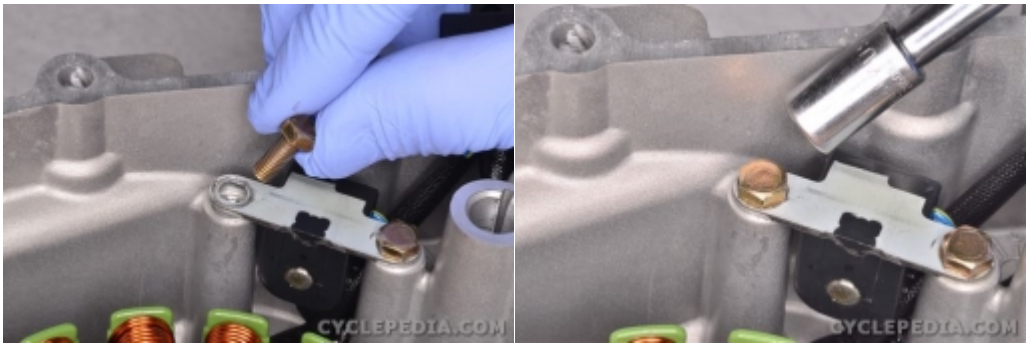
To remove the flywheel see the Flywheel topic

Installation

Fit the stator and ignition pulse generator into the cover together.

Install the three stator coil mounting bolts and tighten them to specification with an 8 mm socket.

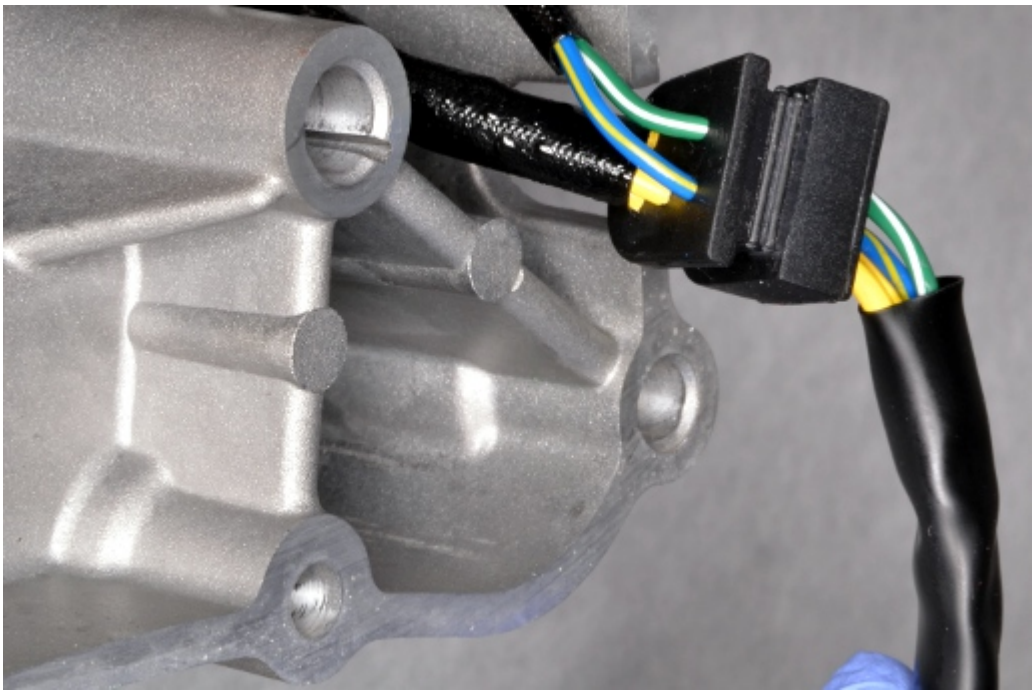
ITEM	N-m	kgf-m	ft-lb
Stator coil bolt	12	1.2	9



Install the two ignition pulse generator bolts and tighten them to specification with an 8 mm socket.

ITEM	N-m	kgf-m	ft-lb
Ignition pulse generator	12	1.2	9

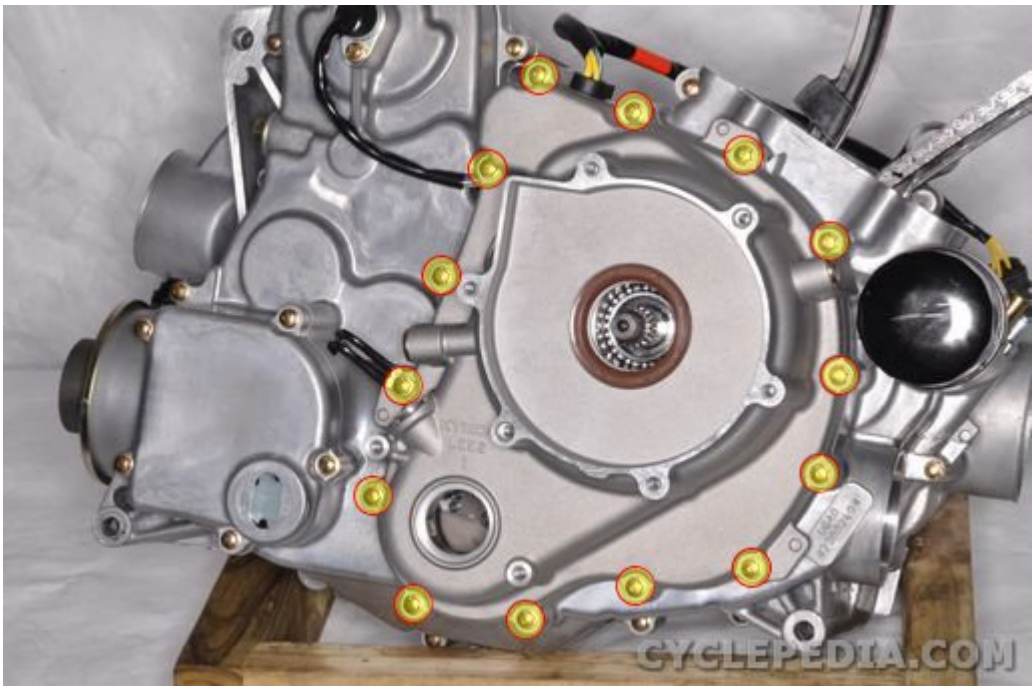
Generator Cover



Apply a silicone sealant to the outside of the rubber wire grommet where it will fit into the generator cover and crankcase. Fit the grommet into the cover.

Install the two dowel pins and a new generator cover gasket.

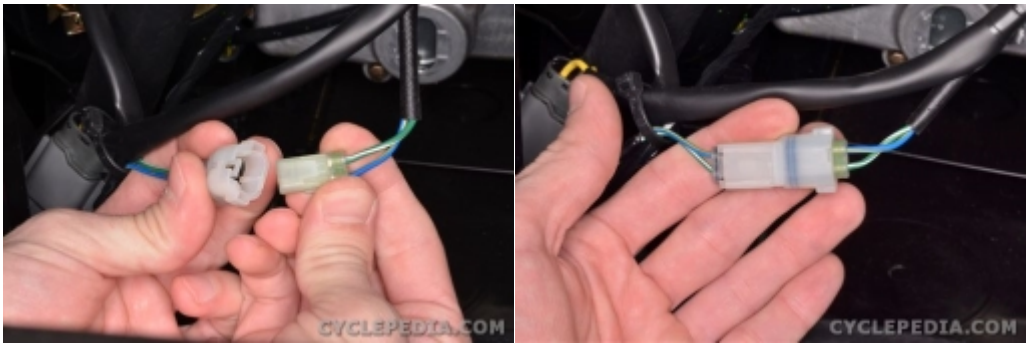
Fit the generator cover onto the crankcase.



Install the 14 generator cover bolts. Tighten the bolts a small amount at a time in a crisscross pattern.

Tighten the generator cover bolts to specification with an 8 mm socket.

Plug in the 4-pin stator connector.



Plug in the 2-pin ignition pulse generator / crank position sensor connector.

Install the recoil starter. See the Recoil Starter Cover topic for more information.

Install the water pump. See the Water Pump topic for more information.

Fill the engine oil. See the Engine Oil topic for more information.

Fill the coolant. See the Coolant topic for more information.

Install the right mudguard and side cover. See the Mudguards and Footrests and Side Covers topics for more information.

Flywheel

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the right side cover and right mudguard. See the Side Covers and Mudguards and Footrests topics for more information.

Drain the coolant. See the Coolant topic for more information.

Drain the engine oil if the water pump is to be removed. See the Engine Oil topic for more information.

Remove the water pump. See the Water Pump topic for more information.

Remove the recoil starter. See the Recoil Starter Cover topic for more information.

Remove the left crankcase cover. See the Generator Cover topic fore more information.

Flywheel

To remove the flywheel a special flywheel puller tool will be needed.

Special Tool- Flywheel Puller: A120E00060

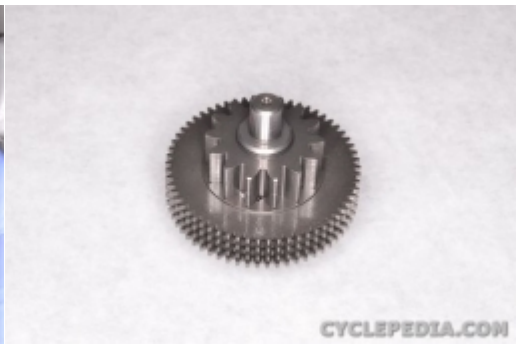
Apply grease to the threads of the flywheel puller. Hold the body of the puller with a large wrench and turn in the pusher bolt to separate the flywheel from the crankshaft.

Remove the flywheel from the crankshaft.

Remove the woodruff key from the crankshaft.

Slide off the starter driven gear.

Starter Reduction Gear



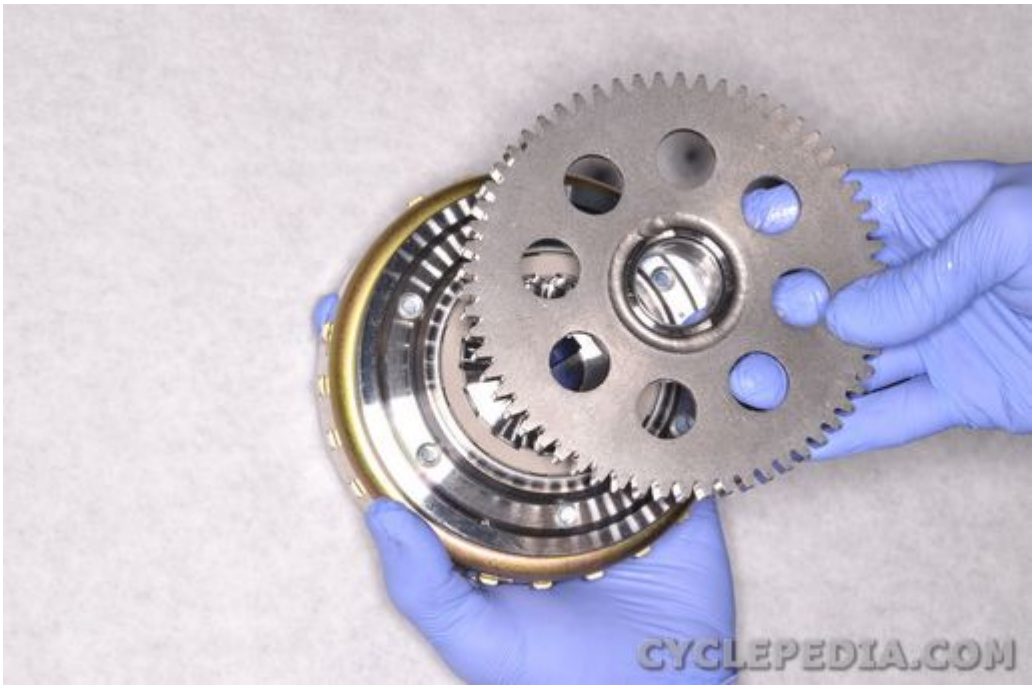
Remove the starter reduction gear from the crankcase.

Inspect the starter reduction gear for wear and damage. Replace the part as a whole if needed.

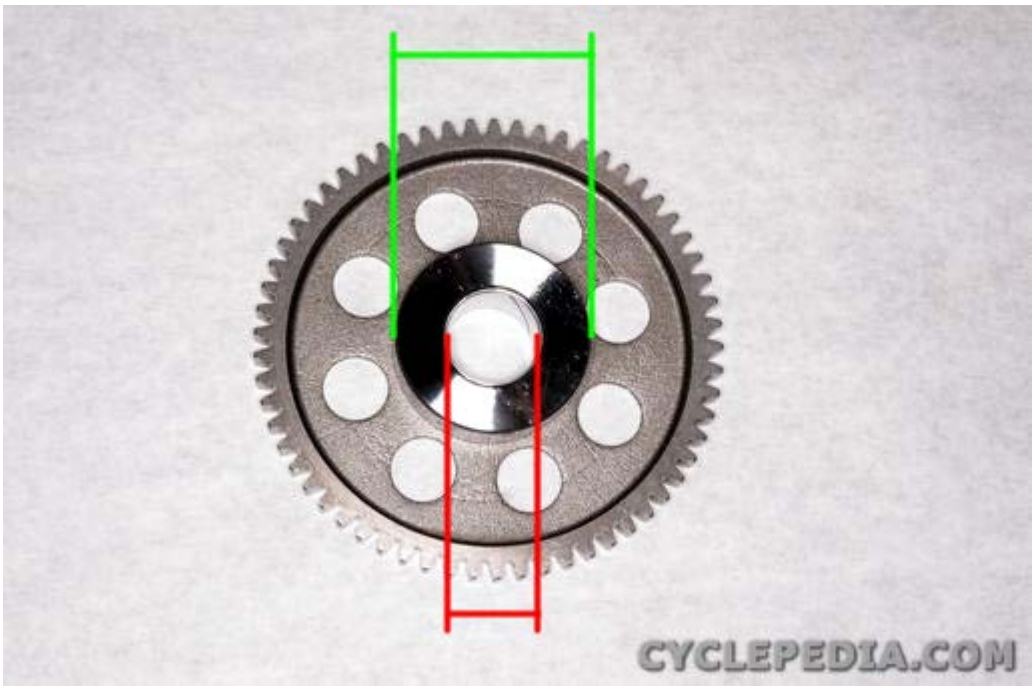
Starter Clutch

The starter clutch and starter driven gear ride on the back of the flywheel.

Inspect the function of the starter clutch by turning the starter driven gear. You should be able to turn the driven gear clockwise smoothly, but the gear should not turn counterclockwise. If the starter clutch allows the gear to turn either way, or will not turn smoothly it must be replaced.



Rotate the starter gear and remove it from the starter clutch on the back of the flywheel.



Inspect the starter driven gear for wear and damage. Measure the outside diameter of the starter driven gear boss and the inside diameter of the starter driven gear where it rides on the crankshaft.

Item	Service Limit
Starter driven gear boss O.D.	57.7 mm (2.272 in)
Starter driven gear bushing I.D.	27.1 mm (1.084 in)

There are six bolts that hold the starter clutch to the back of the flywheel.

Loosen the starter clutch bolts from the outside of the flywheel with a 6 mm Allen.

Remove the starter clutch bolts.

Remove the starter clutch and mounting plate from the back of the flywheel.

Remove the starter clutch from the mounting plate.

Installation

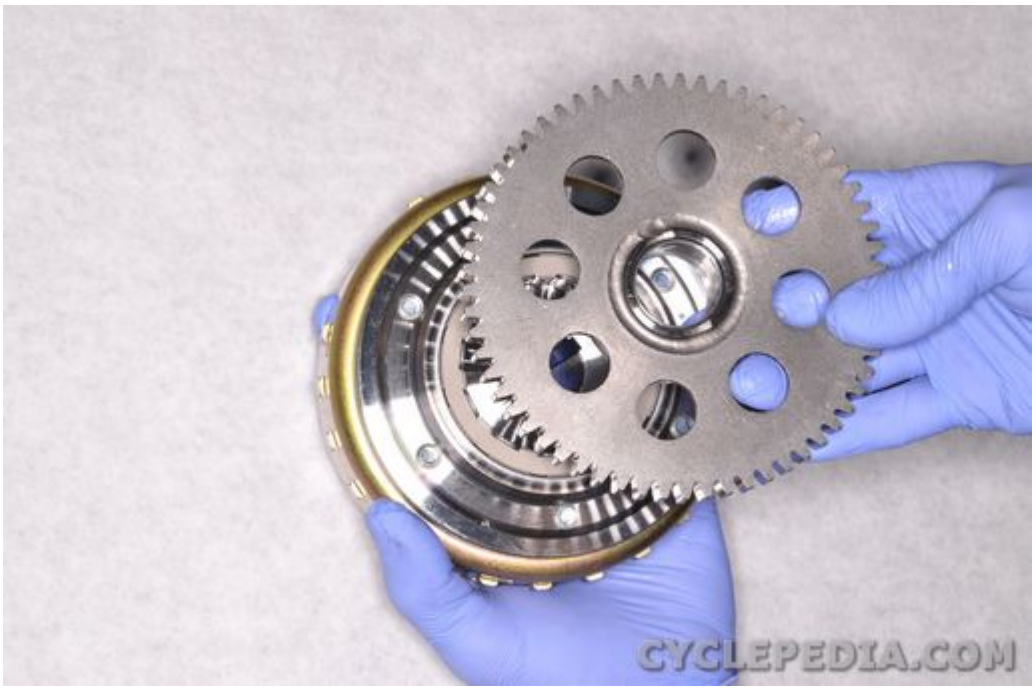
Starter Clutch

Fit the starter clutch into the mounting plate.

Place the starter clutch and mounting plate on the back of the flywheel.

Apply a thread locking agent to the threads of the six starter clutch bolts.

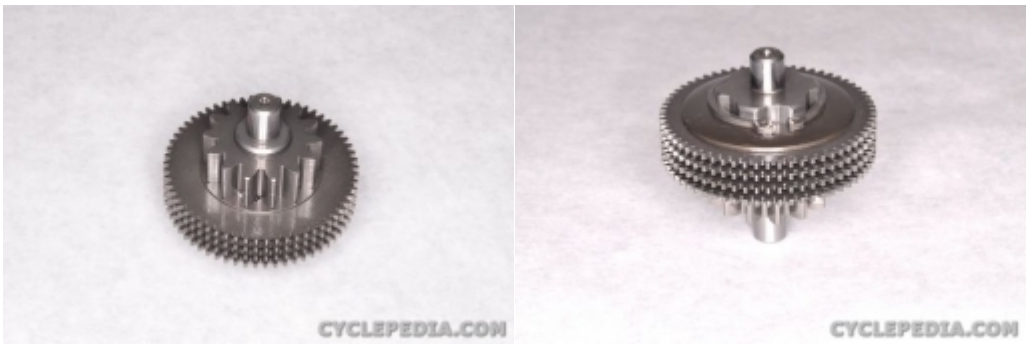
Tighten the starter clutch bolts evenly and securely with a 6 mm Allen.



Lubricate the boss of the starter driven gear with a 50:50 mixture of engine oil and molybdenum grease.

Rotate the starter driven gear clockwise as it is inserted into the starter clutch.

Starter Reduction Gear



Lubricate the starter reduction gear shaft with fresh engine oil.

Install the starter reduction gear into the crankcase as shown.

Flywheel

Install the starter driven gear onto the crankshaft.

Install the woodruff key into the crankshaft. Make sure the tapered area of the crankshaft is clean, oil free, and dry.

Guide the flywheel onto the crankshaft make sure the key lines up with the groove in the flywheel. Rotate the starter driven gear to fit it into the starter clutch if needed.

Install the left crankcase cover. See the Generator Cover topic fore more information.

Install the recoil starter. See the Recoil Starter Cover topic for more information.

Install the water pump. See the Water Pump topic for more information.

Fill the engine oil. See the Engine Oil topic for more information.

Fill the coolant. See the Coolant topic for more information.

Install the right mudguard and side cover. See the Mudguards and Footrests and Side Covers topics for more information.

Oil Pump

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the right side cover and right mudguard. See the Side Covers and Mudguards and Footrests topics for more information.

Drain the coolant. See the Coolant topic for more information.

Drain the engine oil if the water pump is to be removed. See the Engine Oil topic for more information.

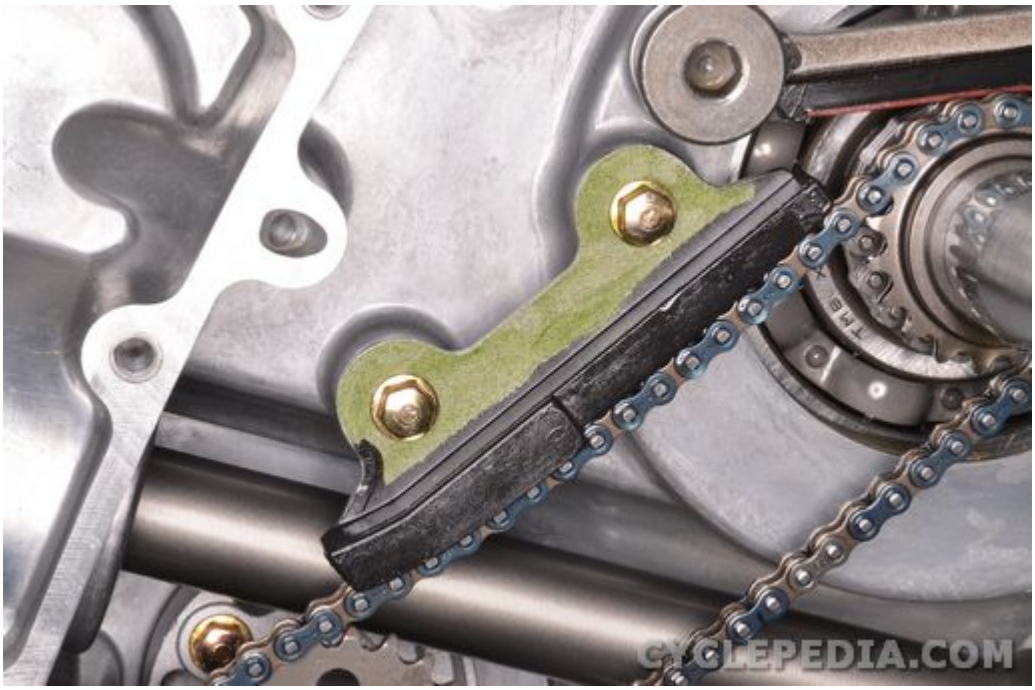
Remove the water pump. See the Water Pump topic for more information.

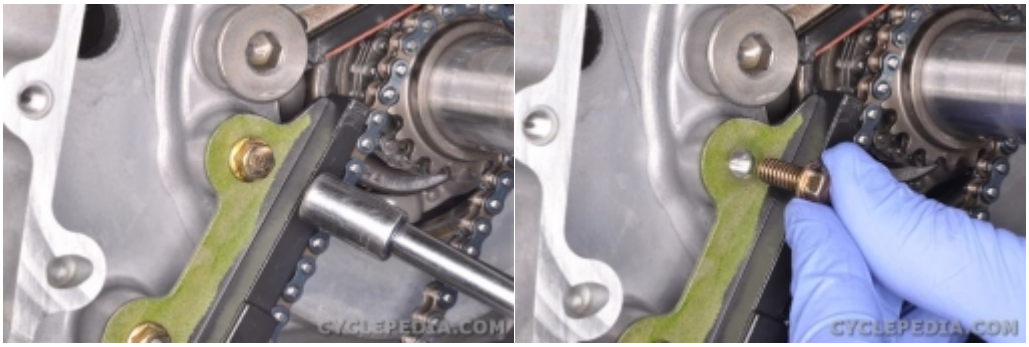
Remove the recoil starter. See the Recoil Starter Cover topic for more information.

Remove the left crankcase cover. See the Generator Cover topic fore more information.

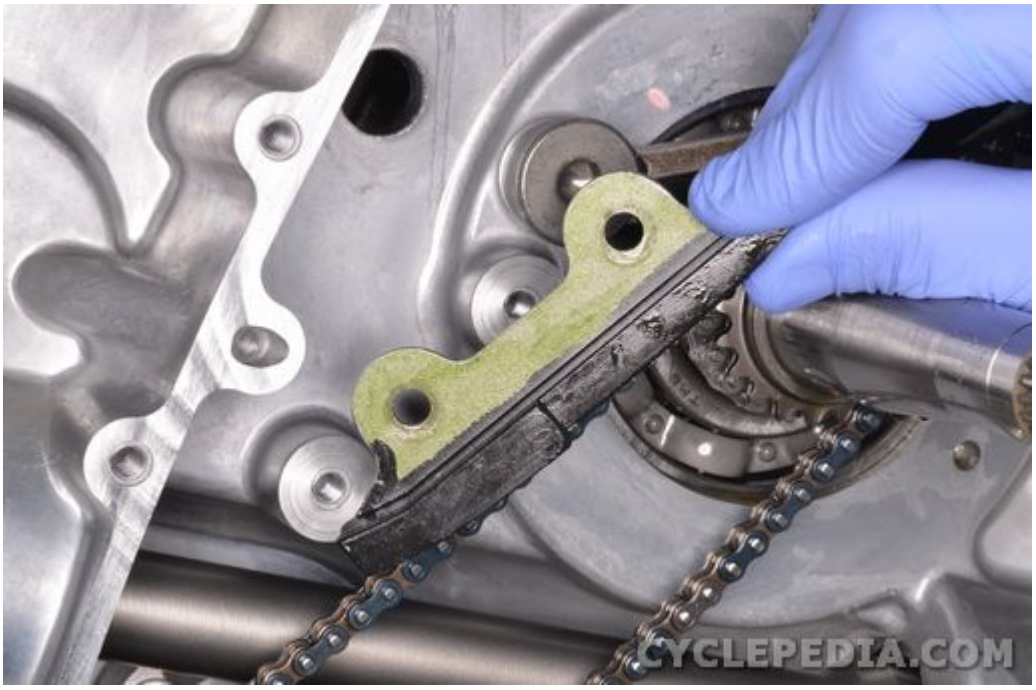
Remove the flywheel. See the Flywheel topic for more information.

The oil pump is driven by a chain off the crankshaft.

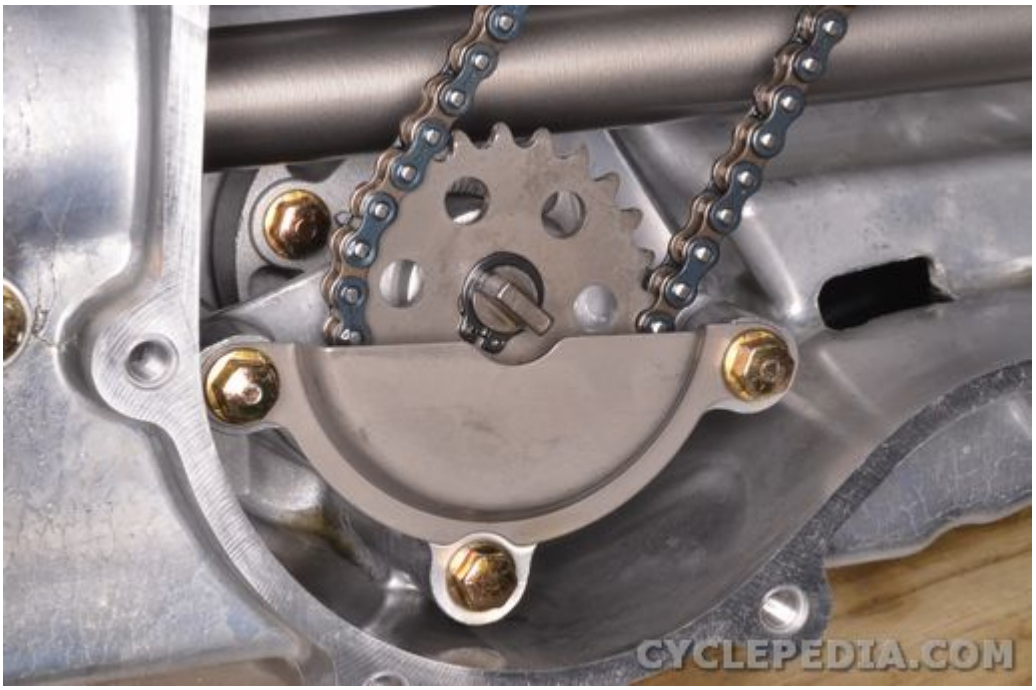




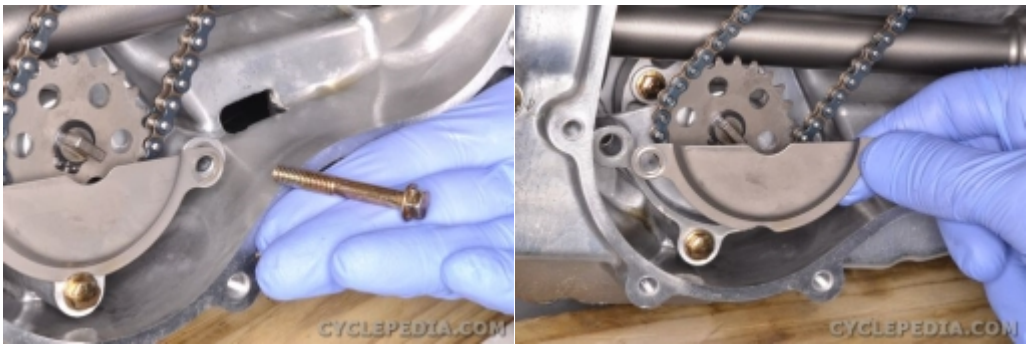
Remove the two oil pump chain guide bolts with an 8 mm socket.



Remove the oil pump chain guide.

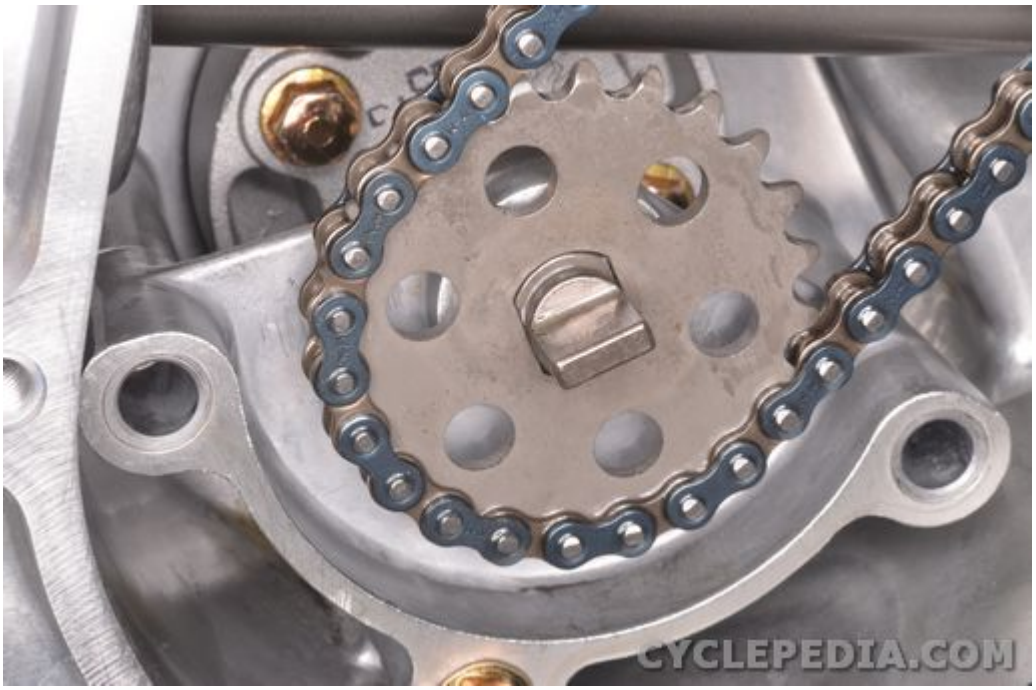


Loosen the two oil pump oil separator bolts with an 8 mm socket.



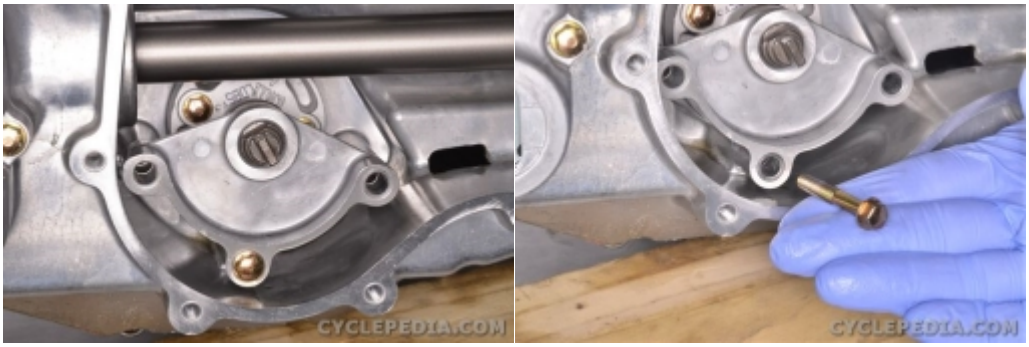
Remove the oil separator bolts and the oil separator.

Remove the snap ring with snap ring pliers.



Slide the oil pump sprocket off of the oil pump shaft.

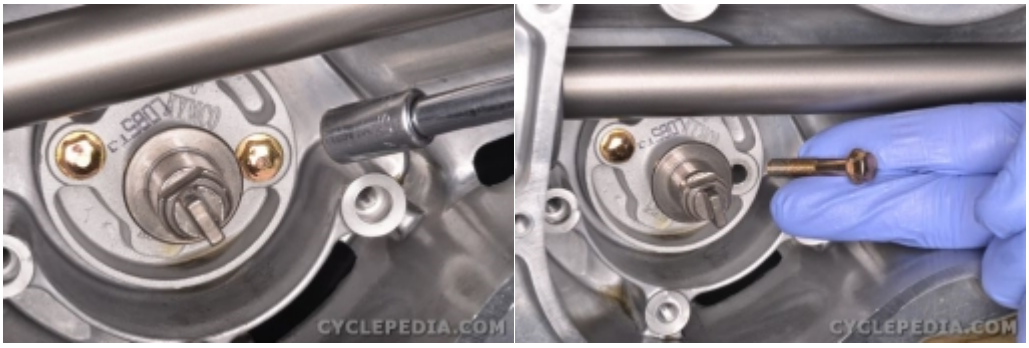
Free the oil pump chain from the crankshaft and remove the oil pump sprocket and chain.



Remove the oil pump shaft holder bolt with an 8 mm socket.

Remove the oil pump shaft holder.

Remove the two oil pump shaft holder dowel pins.



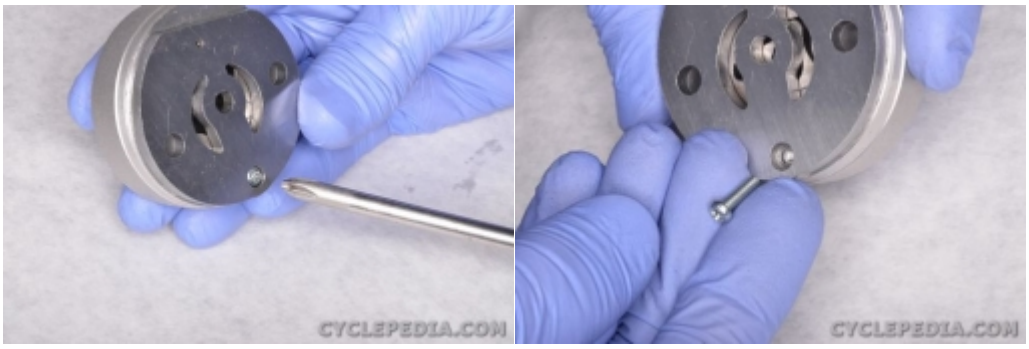
Remove the two oil pump bolts with an 8 mm socket.

Remove the oil pump.

Turn the oil pump shaft and make sure it turns smoothly.

Disassembly

Slide the oil pump shaft out of the oil pump.



Remove the oil pump cover screw.

Remove the oil pump cover.

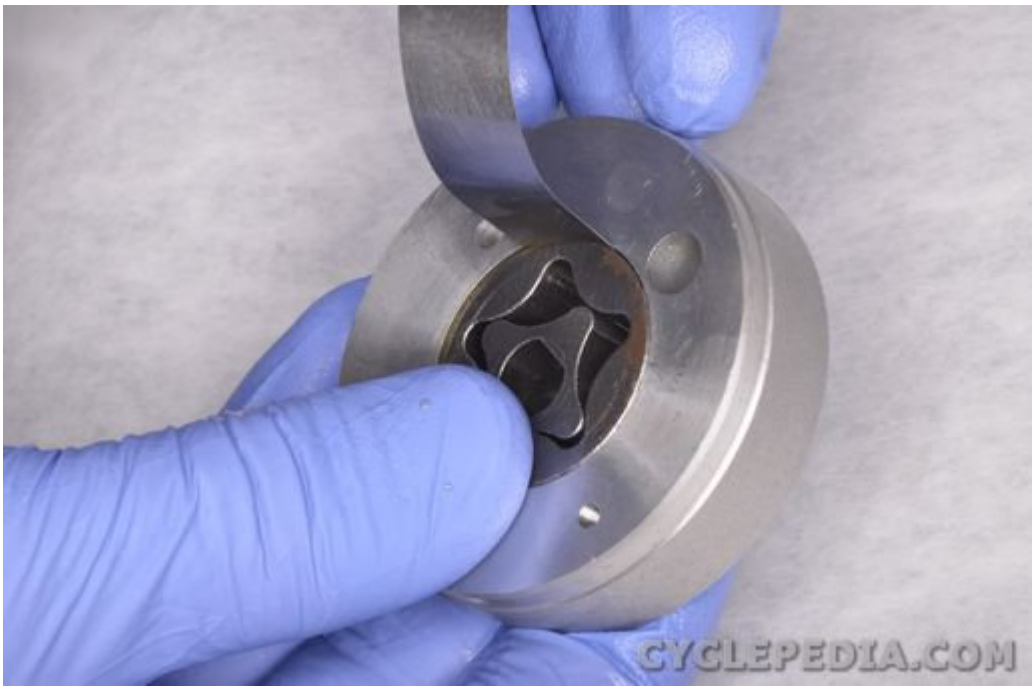
Remove the oil pump dowel pin.

Remove the inner and outer oil pump rotors.

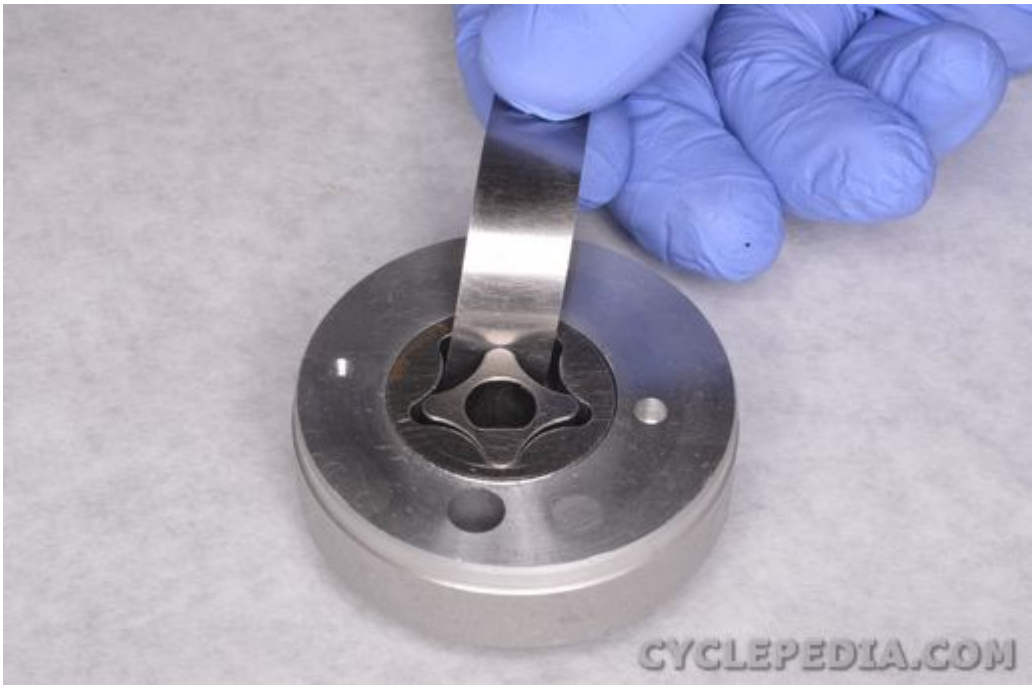
Inspection

Check the oil pump chain guide for signs of excessive wear and damage. Replace it as needed.

Inspect the oil pump chain and sprocket for excessive wear and damage. Replace these components as needed.



Use a feeler gauge set to check the clearance between the outer oil pump rotor and the body (body clearance).



Use a feeler gauge set to check the clearance between the inner and outer rotors (tip clearance).

Place a straight edge across the oil pump body and rotors. Check the side clearance with a feeler gauge.

ITEM		STANDARD mm (in)	SERVICE LIMIT
Oil pump rotor	Tip clearance	0.15 (0.006) max	0.2 (0.008)
	Body clearance	0.15 - 0.2 (0.006 - 0.008)	0.25 (0.01)
	Side clearance	0.04 - 0.09 (0.0016 - 0.0036)	0.12 (0.0048)

Replace the oil pump if the oil pump rotors are damaged or the measurements are out of specification.

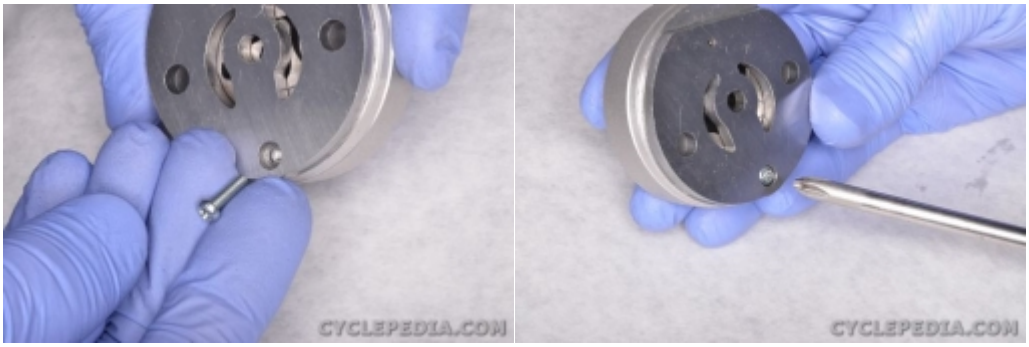
Assembly

Lubricate the rotating parts in fresh engine oil.

Fit the outer and inner rotors into the oil pump body.

Install the oil pump dowel pin.

Install the oil pump cover.



Install the oil pump cover screw and tighten it to specification with a #2 Phillips screwdriver.

ITEM	N-m	kgf-m	ft-lb
Oil pump screw	3	0.3	2

Slide the oil pump shaft into the oil pump.

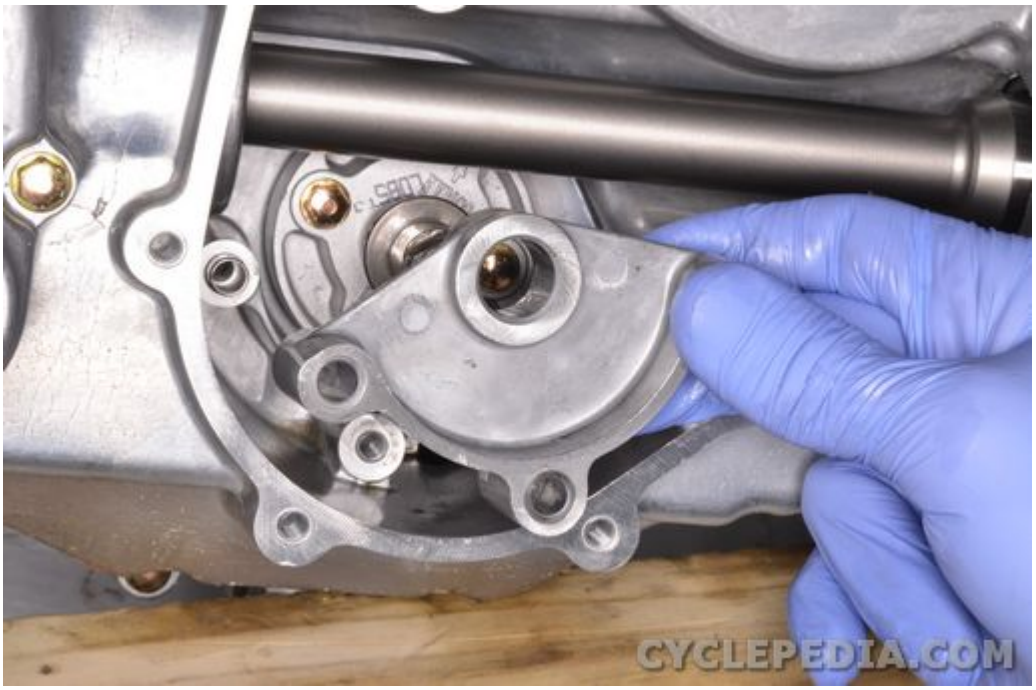
Installation

Fit the oil pump into place with the arrow pointing up.

Insert the two oil pump mounting bolts and tighten them securely

Turn the oil pump shaft and make sure it turns smoothly.

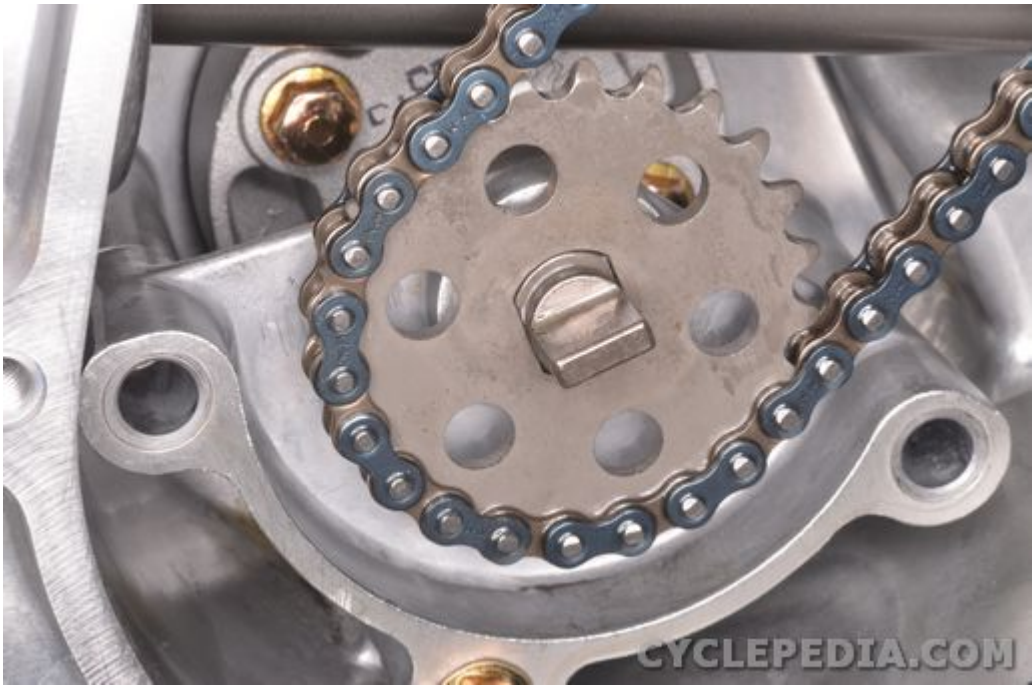
Install the two oil pump shaft holder dowel pins.



Fit the oil pump shaft holder into place.

Install the oil pump shaft holder bolt. Do not tighten, yet.

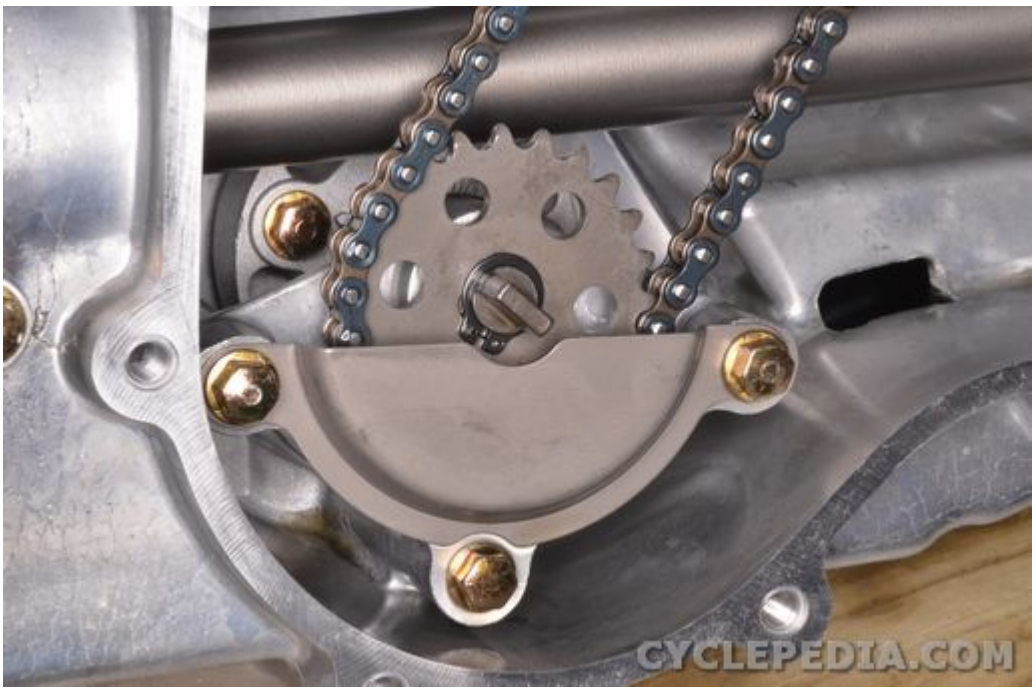
Fit the oil pump sprocket and chain into place. Engage the chain to its drive sprocket on the crankshaft.



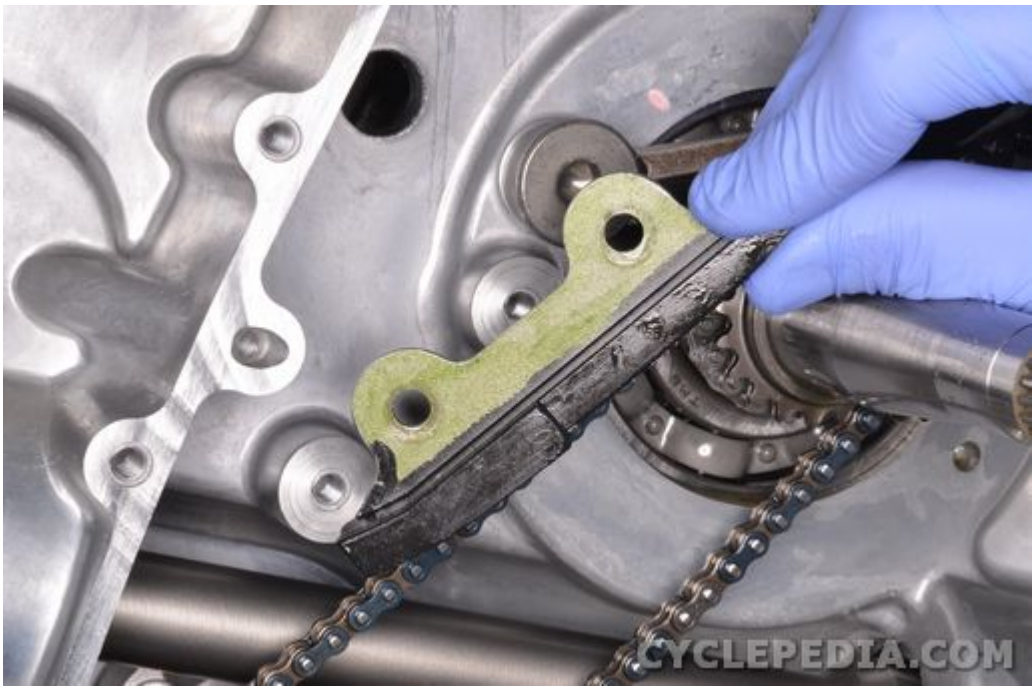
Fit the oil pump sprocket onto the oil pump shaft.

Install the new snap ring with snap ring pliers.

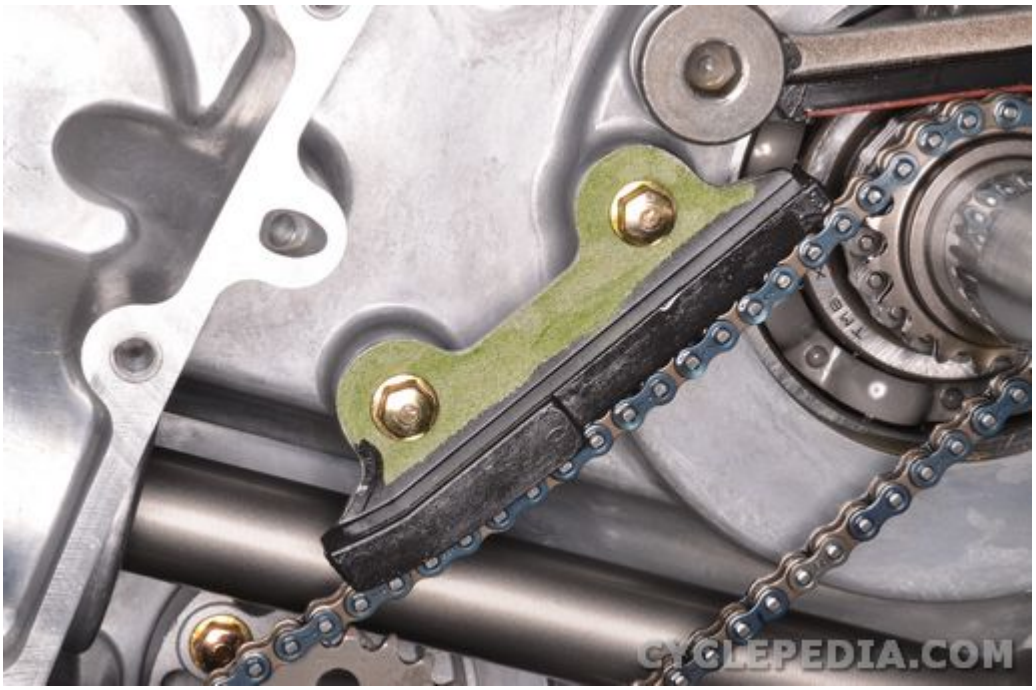
Install the oil separator and the two mounting bolts.



Tighten the oil pump holder shaft bolt and two oil separator mounting bolts securely with an 8 mm socket. Tighten the bolts evenly in a crisscross pattern.



Fit the oil pump chain guide into place.



Install the two oil pump chain guide bolts and tighten them securely with an 8 mm socket.

Install the flywheel. See the Flywheel topic for more information.

Install the left crankcase cover. See the Generator Cover topic fore more information.

Install the recoil starter. See the Recoil Starter Cover topic for more information.

Install the water pump. See the Water Pump topic for more information.

Fill the engine oil. See the Engine Oil topic for more information.

Fill the coolant. See the Coolant topic for more information.

Install the right mudguard and side cover. See the Mudguards and Footrests and Side Covers topics for more information.

Cam Chain

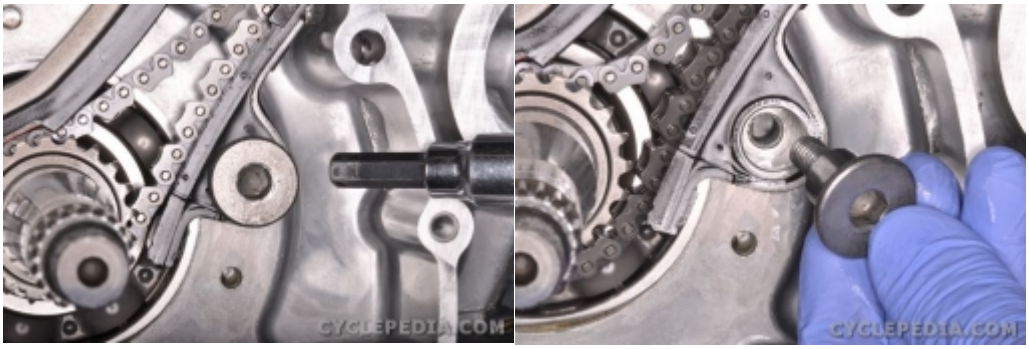
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the following components:

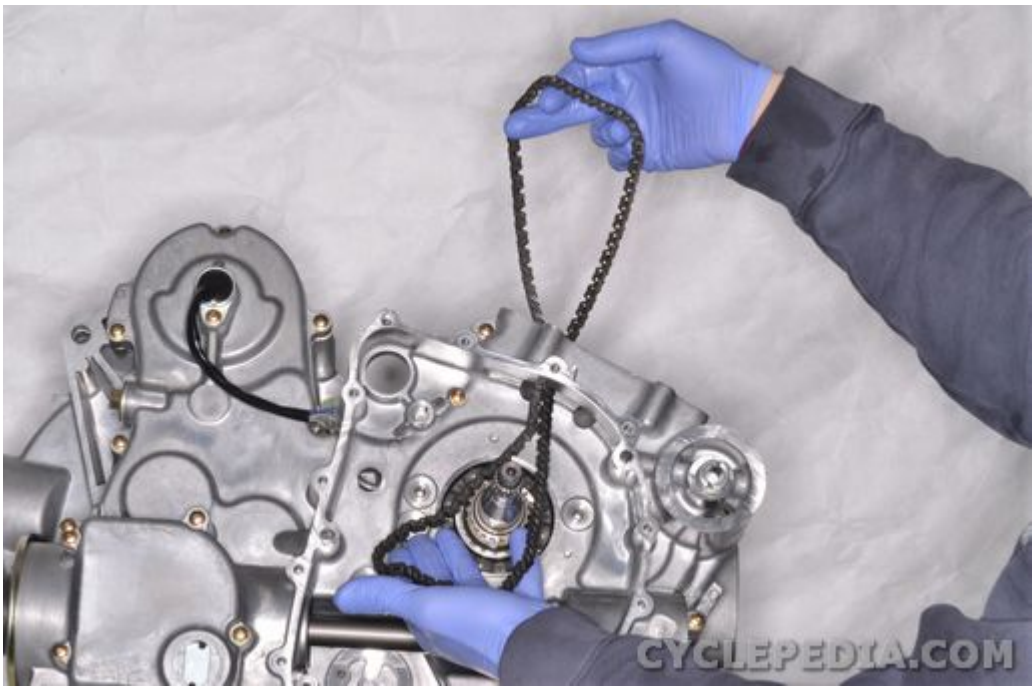
- Cylinder Head
- Cylinder and Piston
- Recoil Starter Cover
- Generator Cover
- Flywheel
- Oil Pump - Oil pump sprocket and chain

There are two cam chain guides that are mounting on pivot bolts. The larger guide is the one that is contacted by the cam chain tensioner.



Remove the two cam chain guide pivot bolts with an 8 mm Allen.

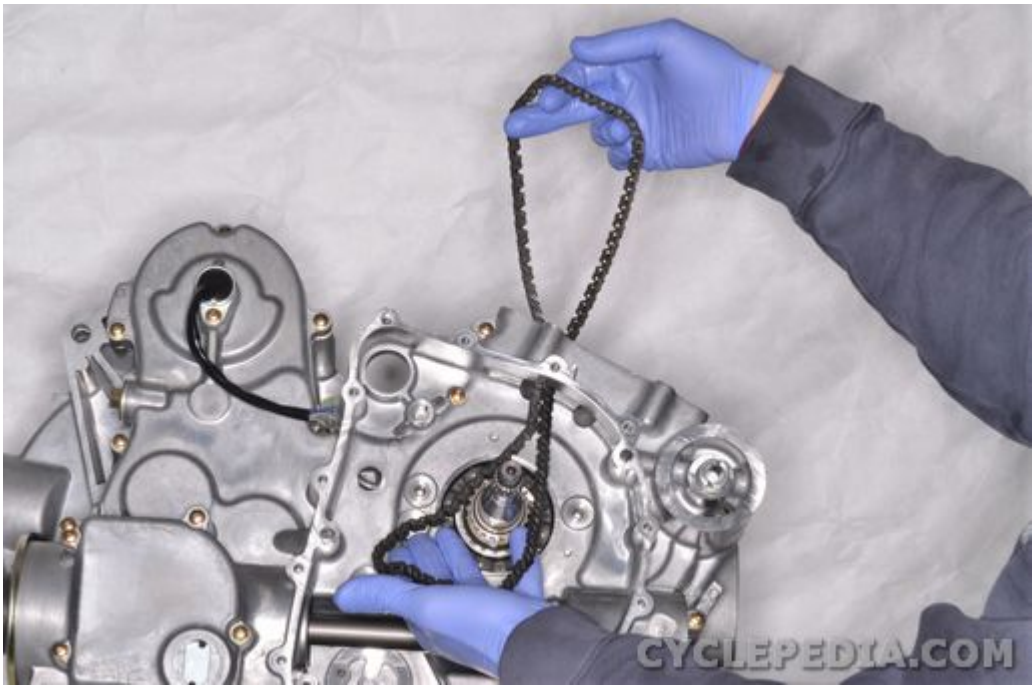
Inspect the cam chain guides for excessive wear and damage. Replace the guides as needed.



Remove the cam chain.

Inspect the cam chain for kinking, fatigue, and damage. Replace the cam chain as needed.

Installation



Fit the cam chain into place. Of the two sprockets on the crankshaft the cam chain's timing sprocket is the inner sprocket. The outer sprocket is the oil pump drive chain sprocket.

Install the two cam chain guides. The larger guide is on the tensioner side.

Install the two cam chain guide pivot bolts and tighten them to specification with an 8 mm Allen.

ITEM	N-m	kgf-m	ft-lb
Cam chain guide pivot bolt	20	2.0	15

Install the following components:

- Oil Pump - Oil pump sprocket and chain
- Flywheel

- Generator Cover
- Recoil Starter Cover
- Cylinder and Piston
- Cylinder Head

Engine Removal

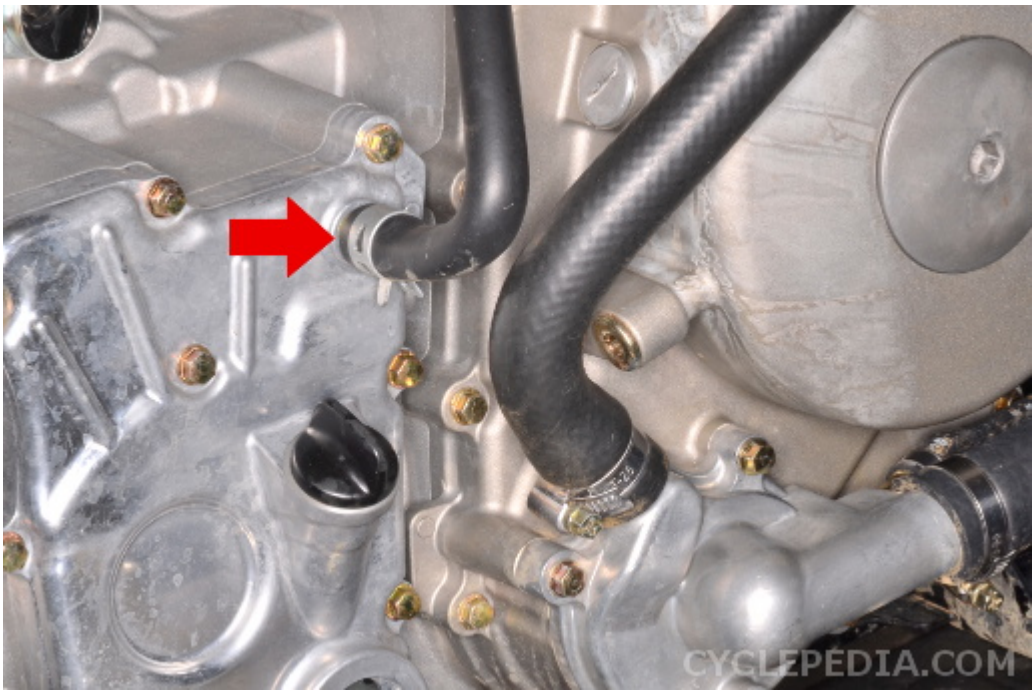
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Remove these components	
Component	Topic
Seat	Seat
Battery	Battery
Front cover	Front Cover
Side Covers	Side Covers
Fuel tank and shield	Fuel Tank
Rack	Racks
Front fender	Front Fender
Mudguards	Mudguards and Footrests
Rear fender	Rear Fender
Airbox and ducts	Airbox
Exhaust system	Exhaust System
Throttle body	Throttle Body Removal and Installation
Brake Pedal	Brake Pedal and Master Cylinder
Drain the engine oil	Engine Oil
Drain the coolant	Coolant
Remove the CVT cooling ducts	CVT Cooling Ducts
Drive selector	Drive Mode Selector

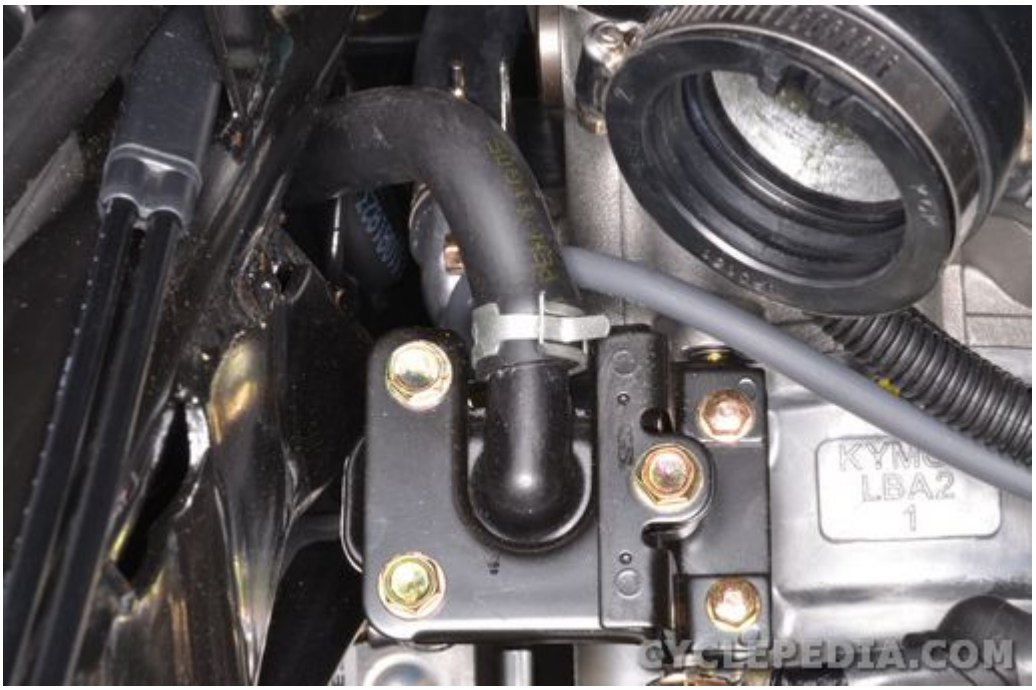
Support the vehicle on a level surface so that it cannot move as you remove the engine.

Pull the spark plug cap off of the spark plug.

Disconnect the crankcase breather hose from the cylinder head cover on the MXU 500i models.

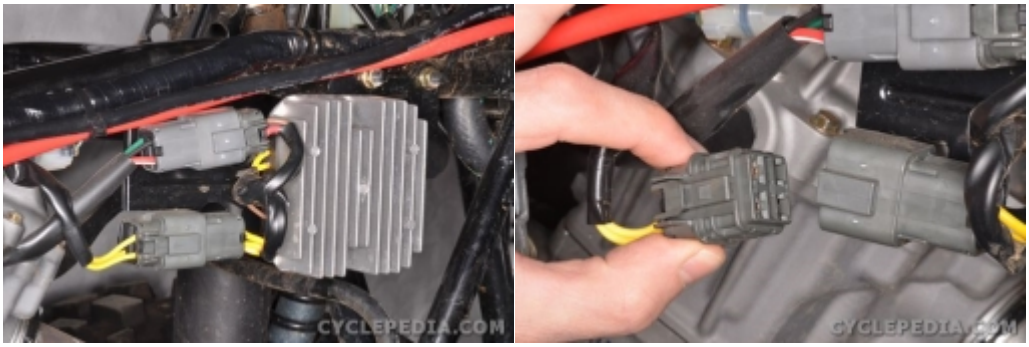


Free the breather hose from the bevel gear cover on the MXU 700i models.

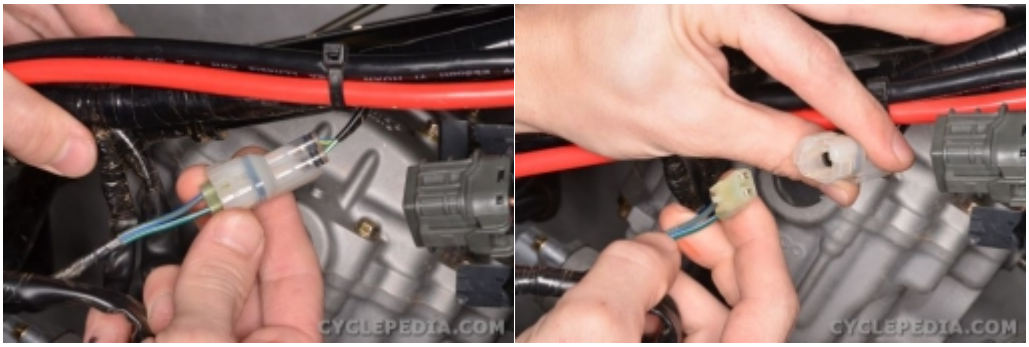


Disconnect the air inlet hose from the PAIR valve on vehicles equipped with an air injection emissions system.

Push in the spring and unplug the WTS sensor connector.

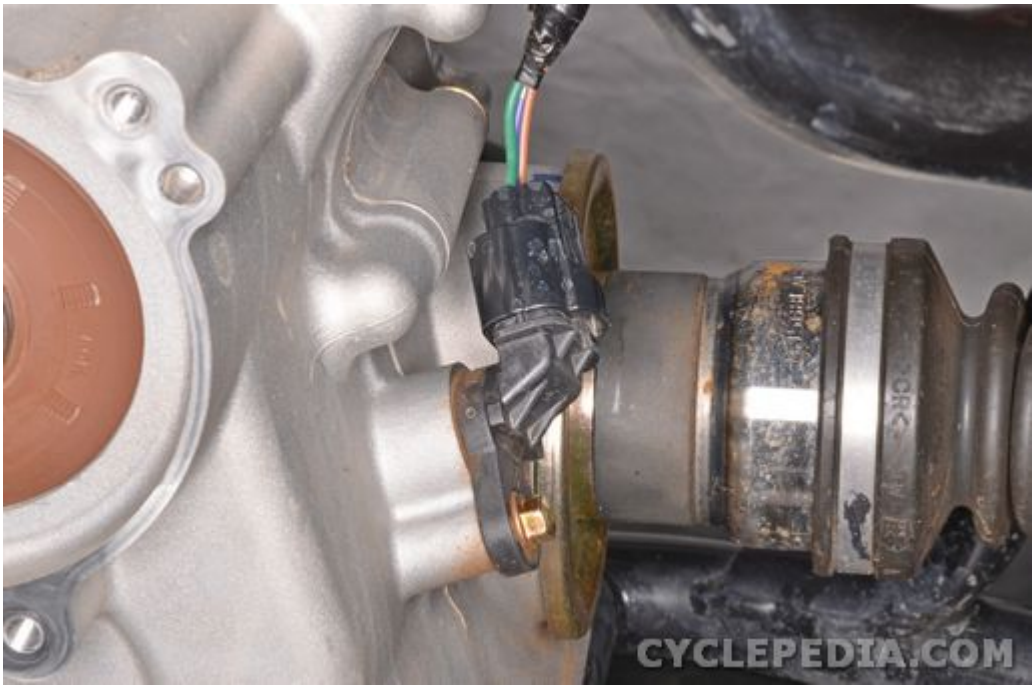


Trace the wires up from the generator cover. Unplug the 4-pin stator connector.



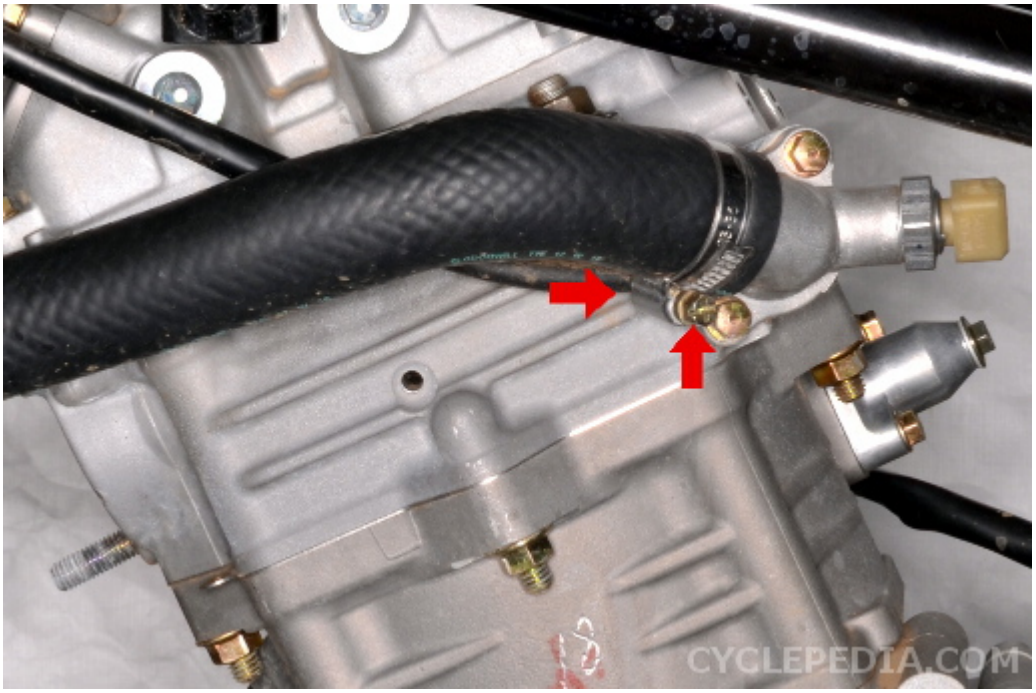
Unplug the 2-pin ignition pulse generator / crank position sensor connector.

Trace the wires up from the gear position switch. Unplug the gear position switch connector.

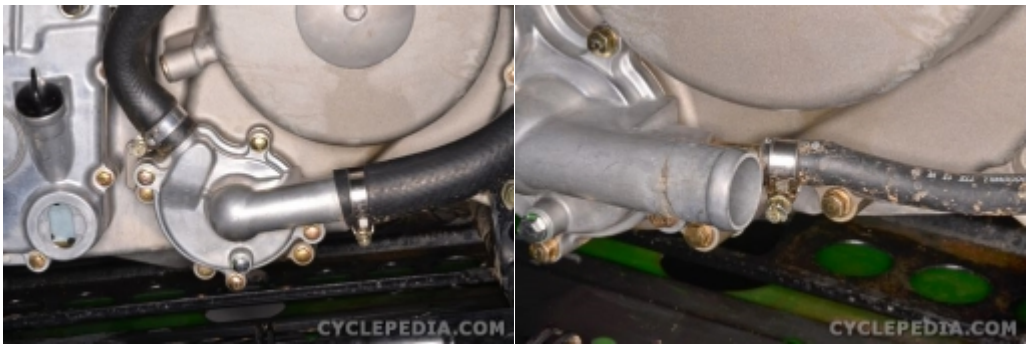


Unplug the connector from the speed sensor.

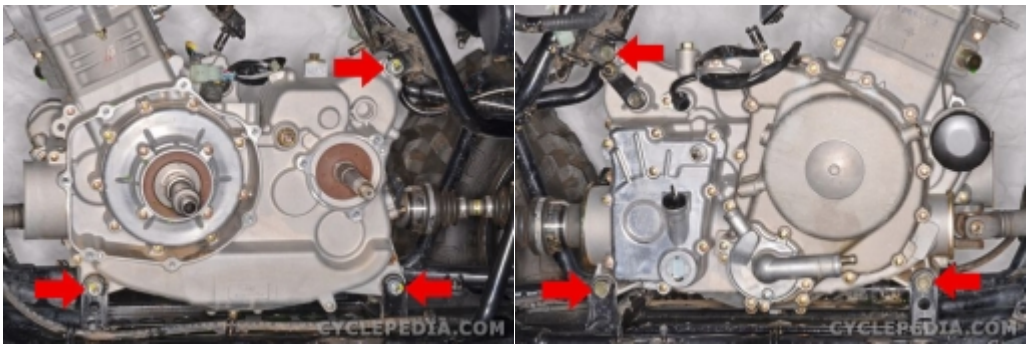
Pull back the rubber cover from the starter motor terminal. Loosen the starter motor terminal nut with a 10 mm socket and free the lead from the terminal. Remove the starter motor mounting bolt with the ground wire with an 8 mm socket. Free the ground wire from the engine.



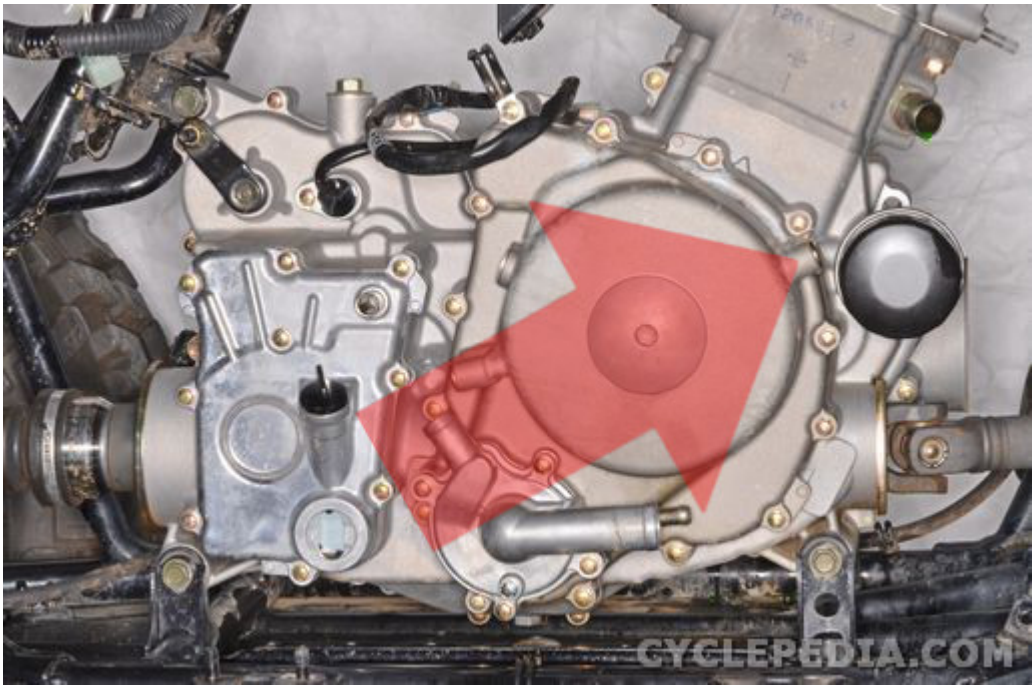
Squeeze the clamp on the air bleed hose and slide it back. Loosen the coolant hose clamp with a #2 Phillips screwdriver. Free the hoses from the WTS housing.



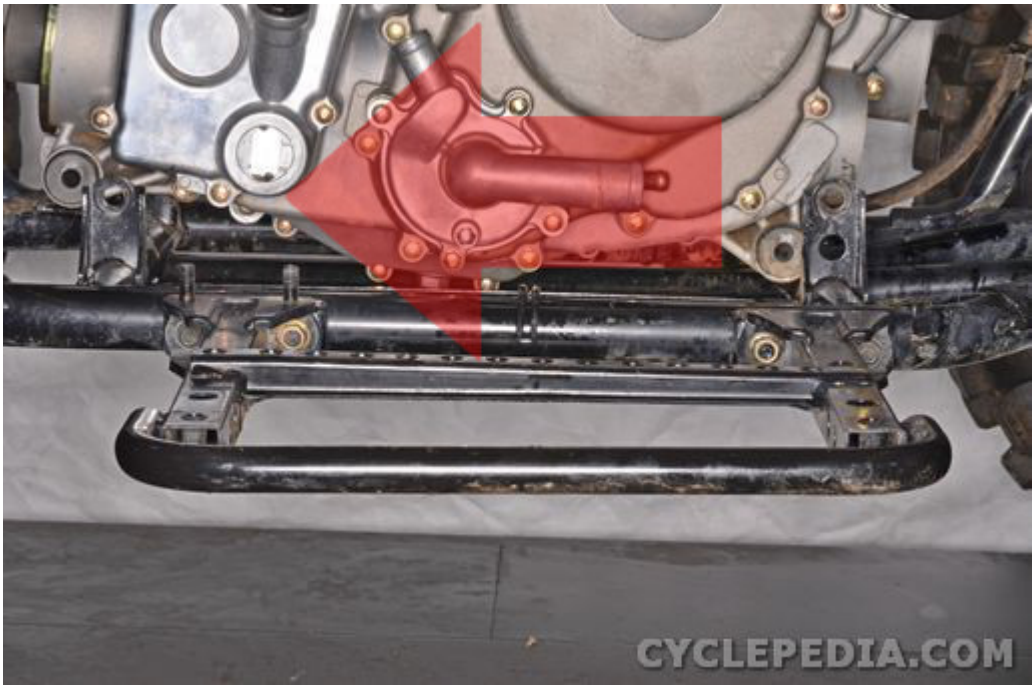
Loosen the bypass (smaller) and lower radiator hose (larger) clamp with a #2 Phillips screwdriver. Free the hoses from the water pump.



There are three engine mounts. Hold the bolts and loosen the nuts. Remove the engine mounting bolts and nuts.



Lift the front of the engine and move it forward to disconnect the rear propeller shaft. Remove the rear propeller shaft.



Slide the engine back.

Disconnect the front propeller shaft.

Note: Do note lose the propeller shaft springs.

Lift the rear of the engine and tilt the engine forward to lower the cylinder head. Guide the engine out of the left side of the frame.

To install the engine. See the Engine Installation topic for more information.

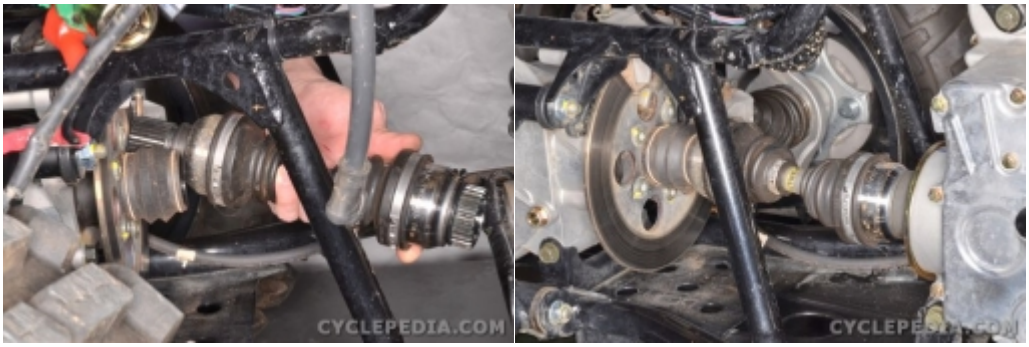
Engine Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

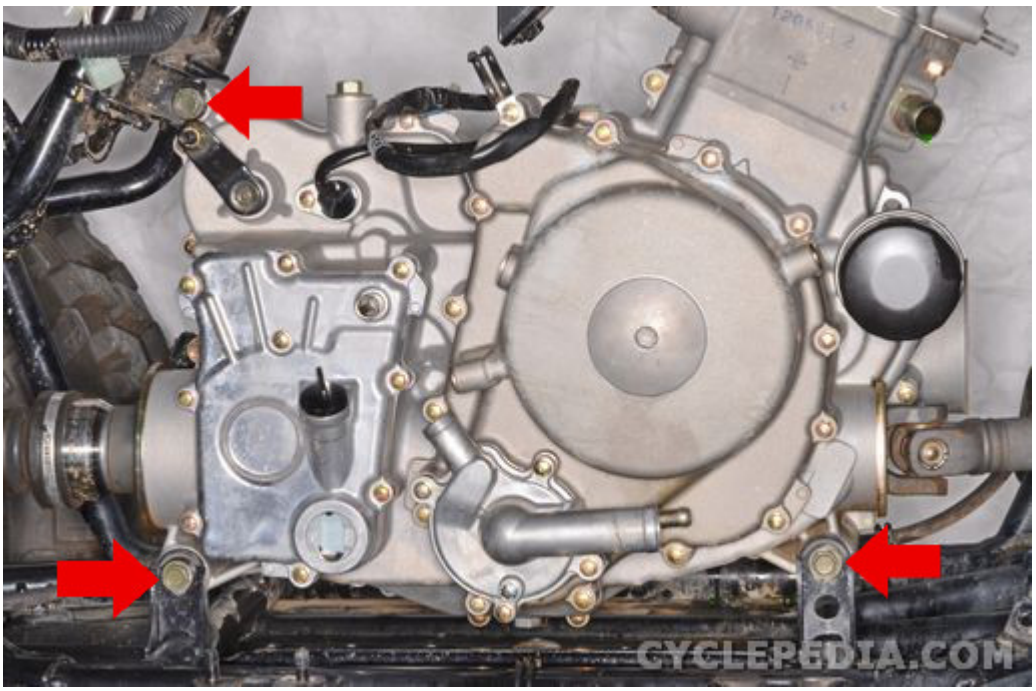
Lubricate the splines of the propeller shafts and final gear pinion shafts with a lightweight lithium-soap based grease. The propeller shaft springs fit between propeller shafts and the final drive pinion shafts.

Tilt the engine to lower the cylinder head and guide the engine into the frame. Bring the engine in from the left side of the frame.

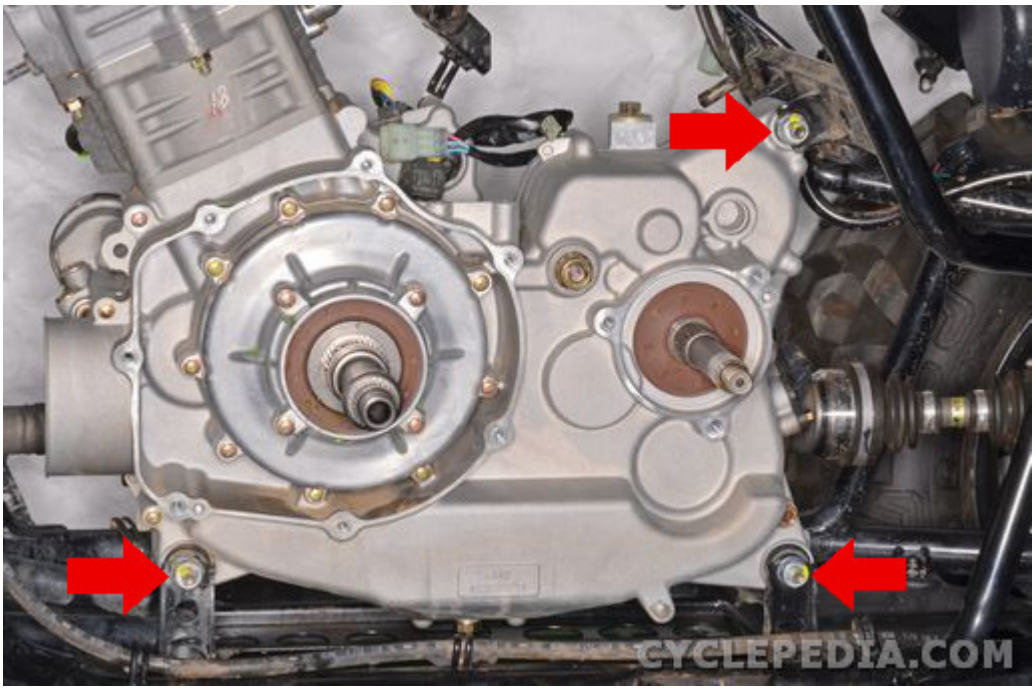
Install the front propeller shaft and slide the engine forward.



Install the rear propeller shaft.

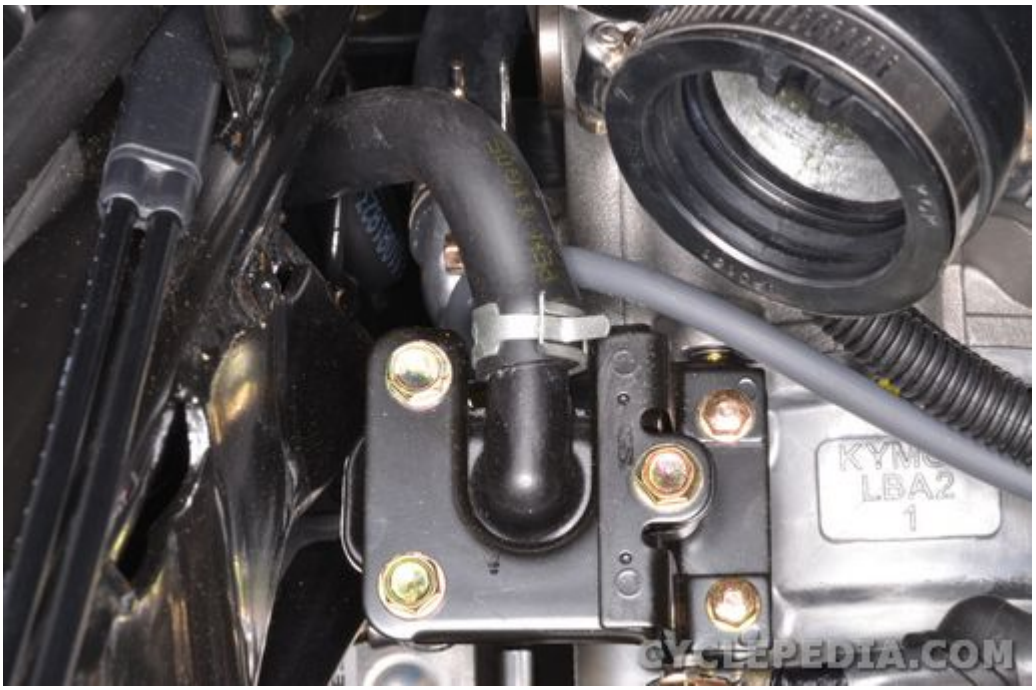


Adjust the engine so that the engine mounts line up correctly. Insert the engine mounting bolts from the right side and thread on the nuts.

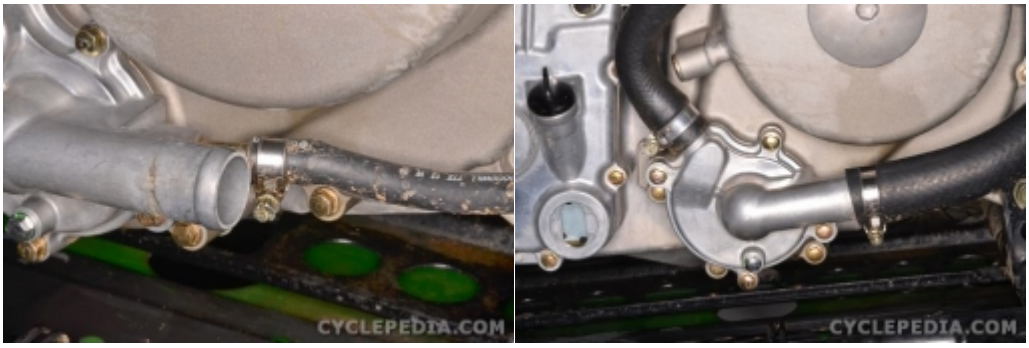


Hold the engine mounting bolts and torque the nuts to specification.

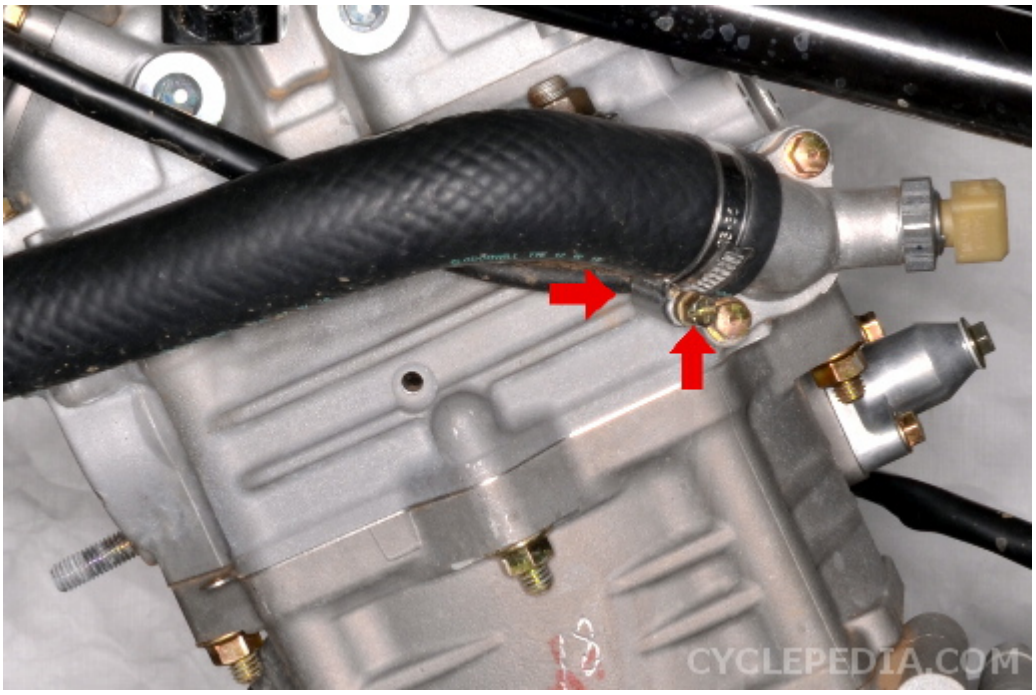
Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Upper engine nut	10	6.0 (60, 43)
Front and rear lower engine nut	10	6.0 (60, 43)



Connect the air inlet hose to the PAIR valve on vehicles equipped with an air injection emissions system.



Connect the coolant hoses to the water pump as shown. Tighten the coolant hose clamps securely with a #2 Phillips screwdriver.

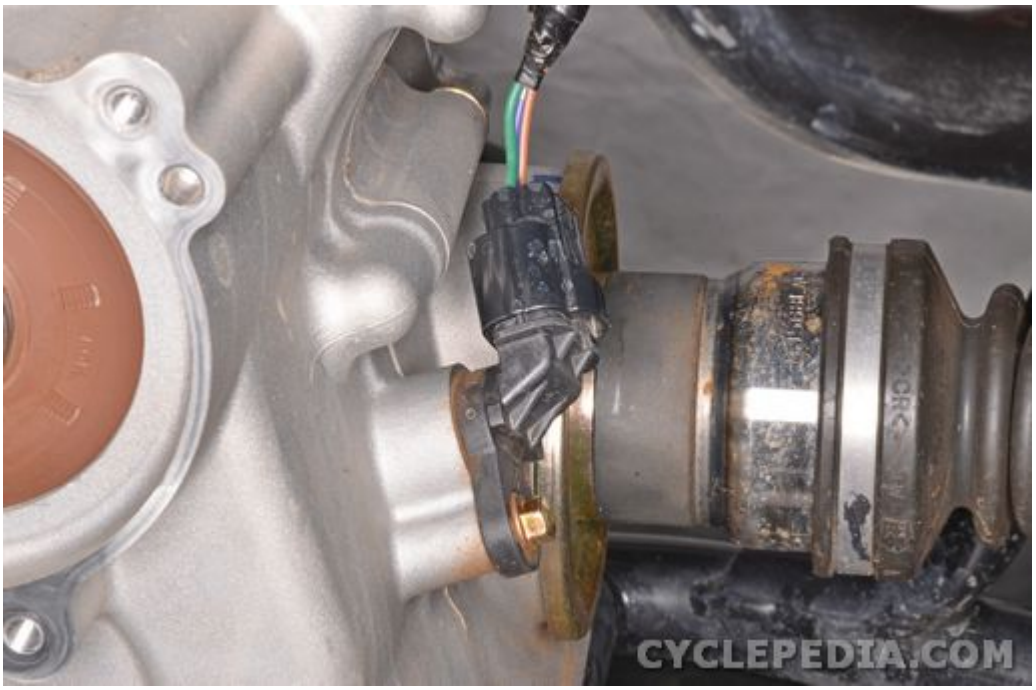


Connect the air bleed hose and thermostat hose to the WTS housing. Secure the hoses with the clamps.

Plug in the WTS sensor connector.

Install the ground lead with the starter motor mounting bolt. Tighten the starter motor mounting bolts to specification with an 8 mm socket. Connect the lead to the starter motor. Tighten the nut securely with a 10 mm socket. Move the rubber cover into place over the terminal.

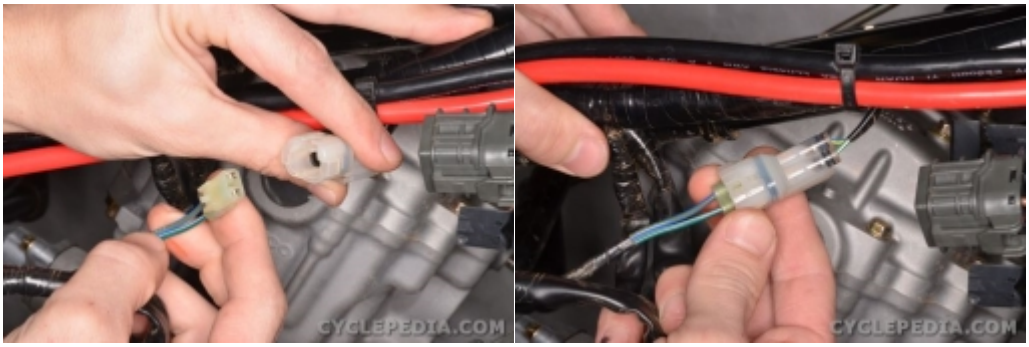
ITEM	THREAD SIZE AND TYPE	TORQUE		
		Nm	kgf-m	ft-lb
STARTER MOTOR BOLT		10.8 ± 1	1.1 ± 0.1	8



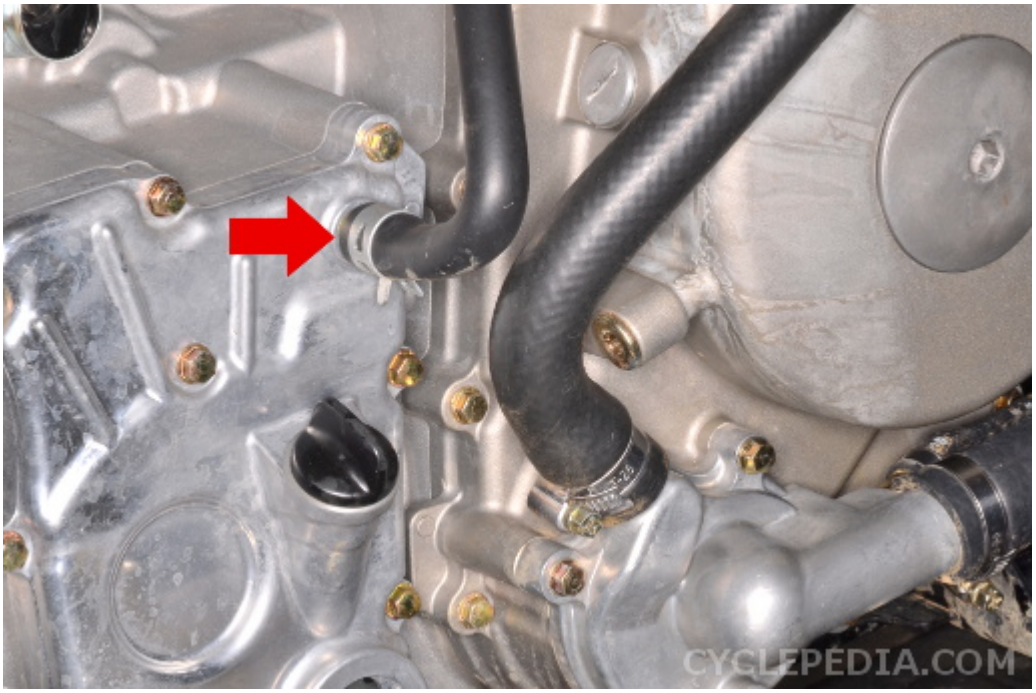
Plug in the speedometer sensor connector.

Plug in the gear position switch connector.

Plug in the 4-pin stator connector.



Plug in the 2-pin ignition pulse generator / crank position sensor connector.



Connect the breather hose to the bevel gear cover on the MXU 700i models. Secure the hose with the clamp.

Connect the crankcase breather hose to the cylinder head cover on the MXU 500i models. Secure the hose with the clamp.

Install the spark plug cap onto the spark plug.

Install these components	
Component	Topic
Drive selector	Drive Mode Selector
CVT cooling ducts	CVT Cooling Ducts
Brake Pedal	Brake Pedal and Master Cylinder
Exhaust system	Exhaust System
Throttle body	Throttle Body Removal and Installation
Airbox	Airbox
Rear fender	Rear Fender

Fuel tank and shield	Fuel Tank
Fill the engine oil	Engine Oil
Fill the coolant	Coolant
Mudguards	Mudguards and Footrests
Side covers	Side Covers
Front cover	Front Cover
Racks	Racks
Battery	Battery
Seat	Seat

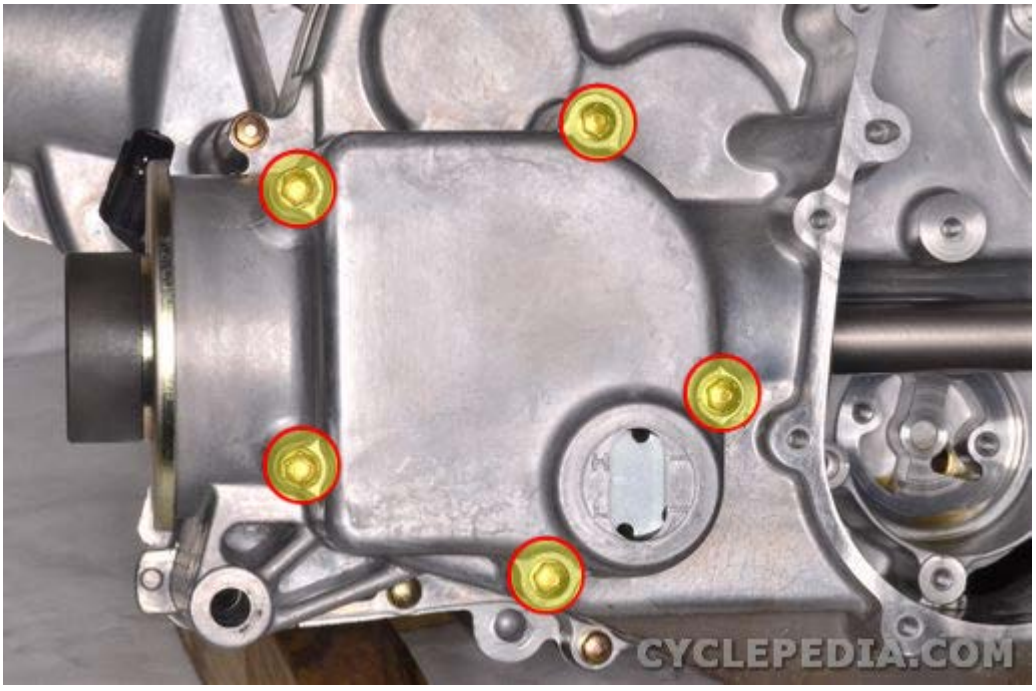
Output Shaft and Bevel Gear

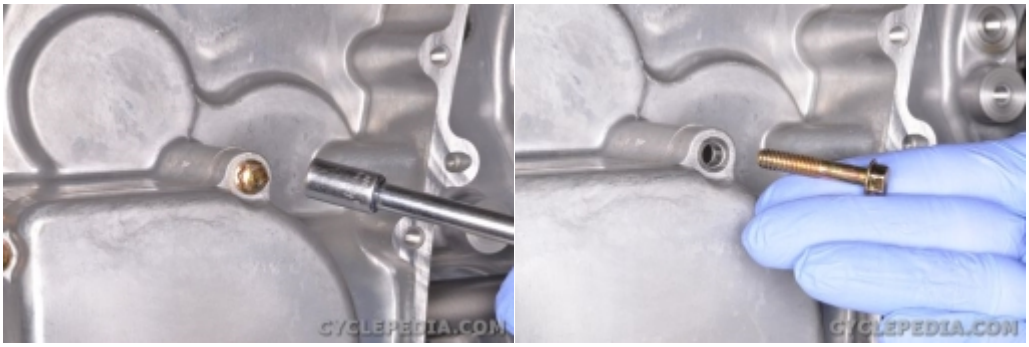
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove the engine. See the Engine Removal topic for more information.

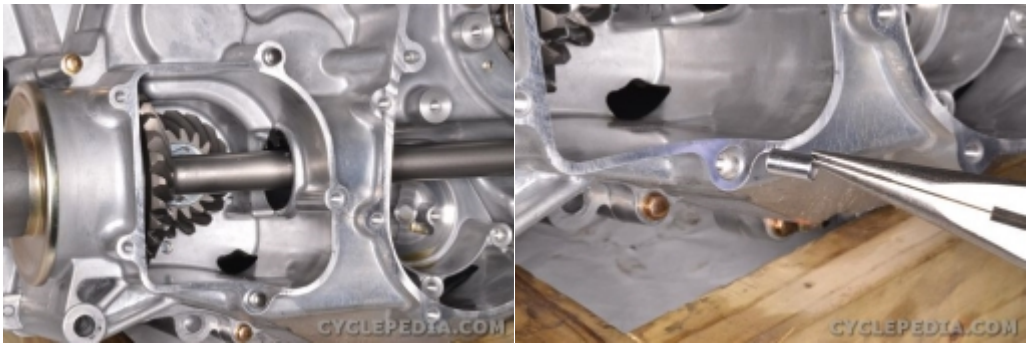
Bevel Gear Cover





Remove the five bevel gear case cover bolts with an 8 mm socket.

Remove the bevel gear cover.

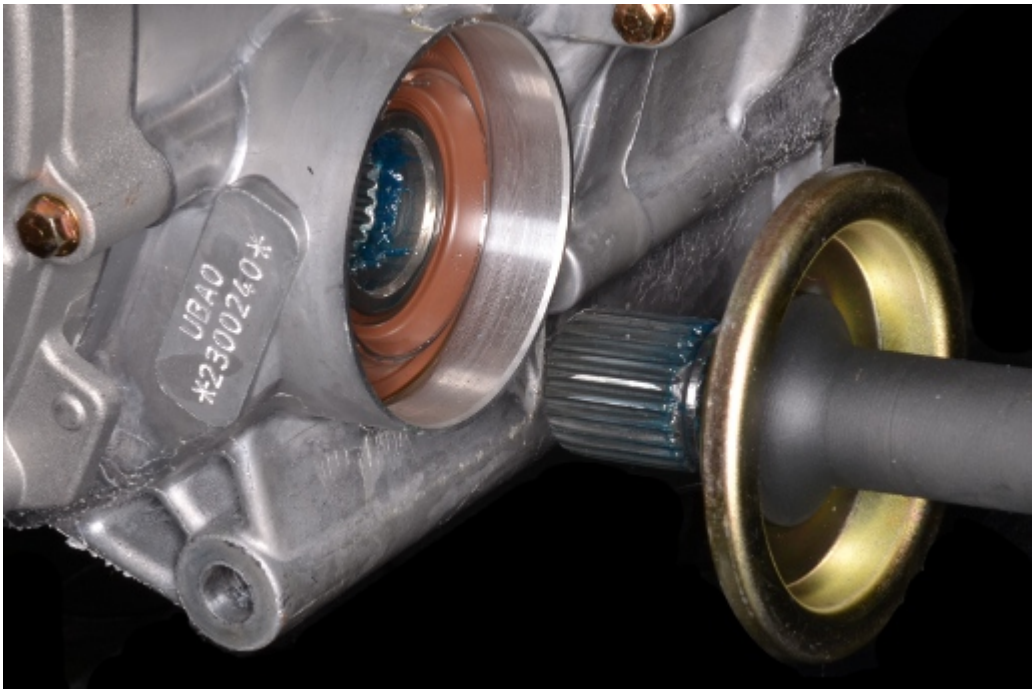


Remove the gasket and the two bevel gear cover dowel pins.

Inspect the oil sight glass and replace it as needed.

Output Shaft and Bevel Gears

Unstake the output shaft nut with a chisel and a hammer.



Insert the rear propeller shaft and hold it to keep the output shaft from turning.

Loosen the output shaft nut with a 26 mm socket.

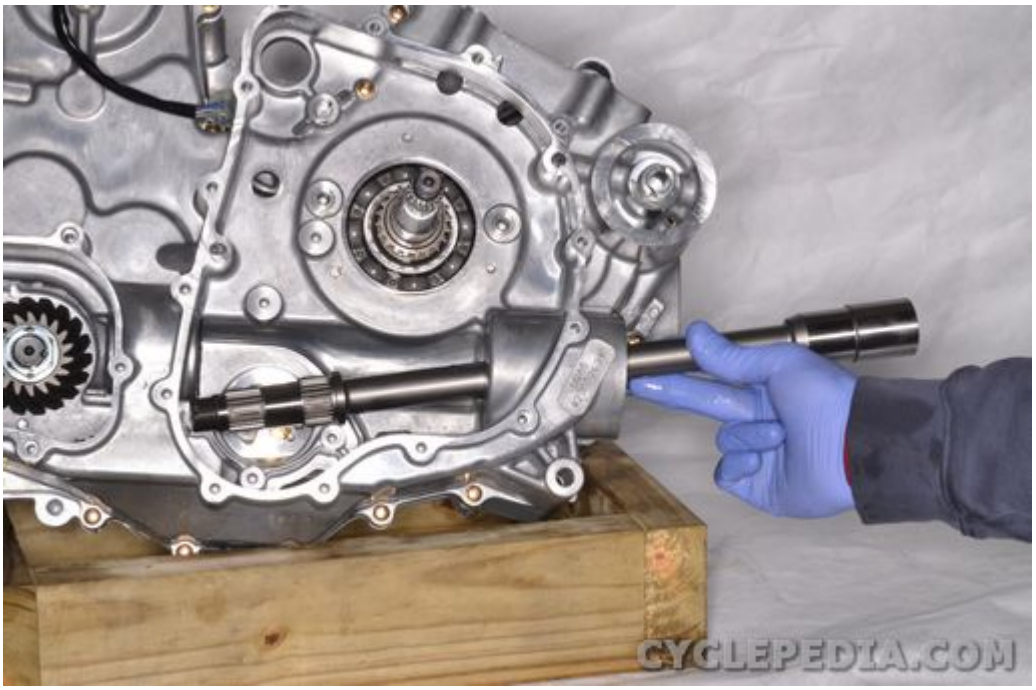
Remove output shaft nut.

Remove the rear propeller shaft coupler from the engine.

Tap the output shaft forward with a rubber mallet.

Move the output shaft forward so that the driven bevel gear can be removed.

Remove the driven bevel gear and shim.



Slide the output shaft out of the engine.

Unstake drive bevel gear nut with a chisel and a hammer.

Remove the belt case cover. See the CVT Removal topic. Hold the driven pulley with a Y-type holder.

Special Tool -
Y-Type Holder: A120E00056

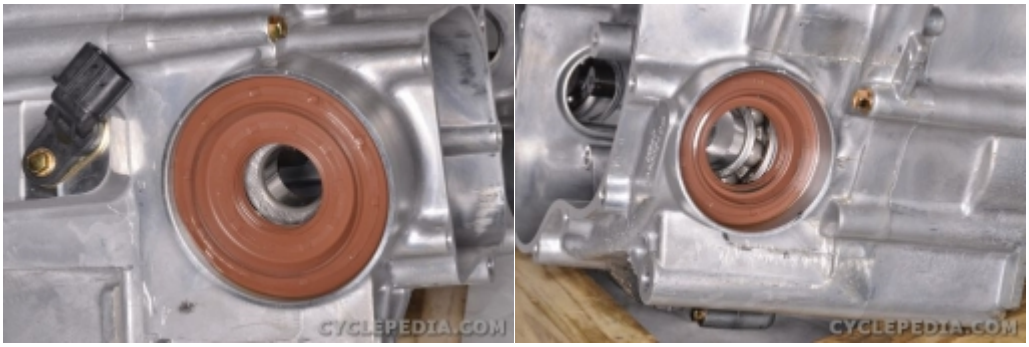
Loosen the drive bevel gear nut with a deep well 26 mm socket.

Remove the drive bevel gear nut.

Slide off the drive bevel gear.

Remove the drive bevel gear shim.

Seals and Bearings



Inspect the propeller shaft oil seals for leaks and damage.

Inspect the bearings by turning them with a finger. Replace the bearings if they do not turn smoothly.

Remove the seals with a seal pick if needed. Replace the oil seals with new items if they are removed.

If the rear bearing needs to be replaced the lock nut must be removed.

Remove the lock nut with the special tool.

Special Tool -
Nut Wrench: A120E00066

Remove the rear bearing with a suitable bearing puller.

Special Tool-
Bearing Puller: A120E00037

Drive in the new bearing with a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out.

Special Tool -
Bearing Driver: A120E00014

Install the lock nut with the special tool.

Special Tool -
Nut Wrench: A120E00066

Torque the lock nut to specification with the special tool.

ITEM	N-m	kgf-m	ft-lb
Driven pulley nut	110	11	79.2

If the front bearing is to be replaced the snap ring must be removed.

Remove the bearing snap ring with snap ring pliers.

Remove the bearing with a suitable bearing puller.

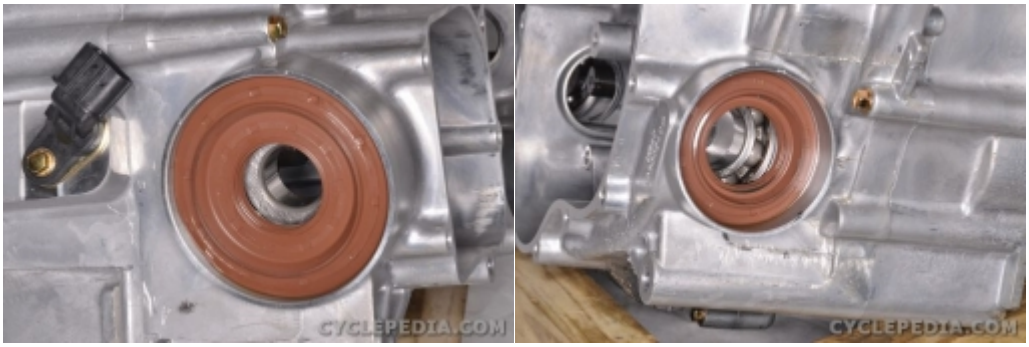
Special Tool-
Bearing Puller: A120E00037

Drive in the new bearing with a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out.

Special Tool -
Bearing Driver: A120E00014

Install a new snap ring with snap ring pliers.

Lubricate the lips of the new oil seals with fresh engine oil.



Press in the new seals with a suitable driver with the same outside diameter as the seals.

Inspection

Inspect the propeller shaft couplers for wear and damage.

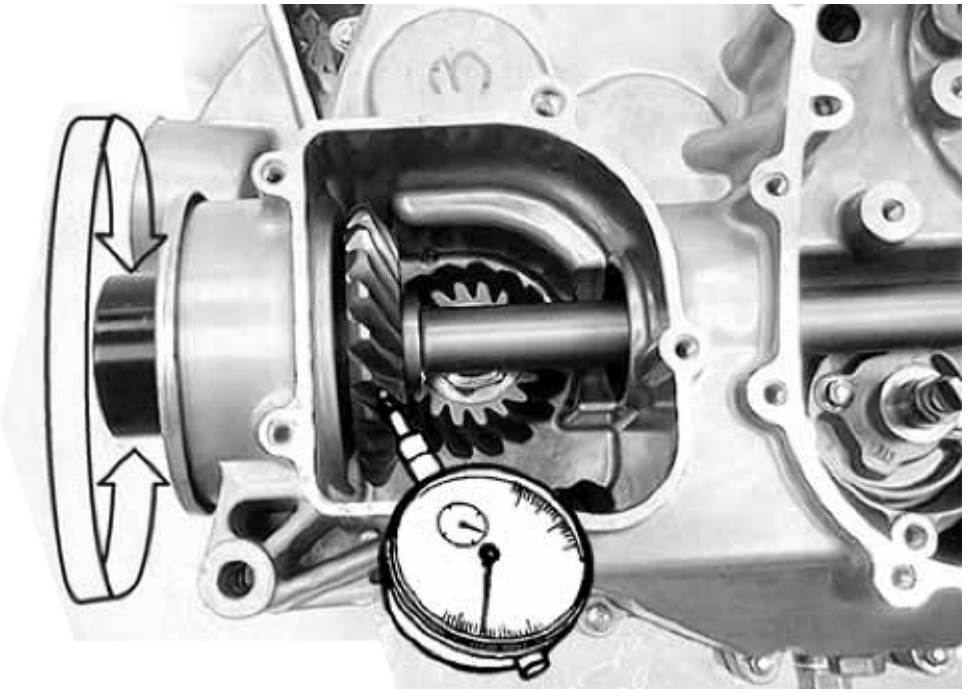
Inspect the bevel gears for wear and damage.

Inspect the output shaft for damage and wear.

Bevel Gear Backlash

Remove the bevel gear cover. The bevel gears must be installed as normal.

Set a dial gauge on the driven bevel gear as shown.



Measure the backlash by turning the rear propeller shaft in each direction, reading the total backlash on the dial gauge. If the backlash is not within specification, the shim must be changed and the backlash should be rechecked until correct.

Bevel gear backlash	0.03 - 0.15 mm (0.001 - 0.006 in)

See the chart for appropriate shim thickness.

Backlash	Shim Adjustment
under 0.03 mm (0.001 in)	Reduce shim thickness
0.03 - 0.15 mm (0.001 - 0.006 in)	Correct shim thickness
over 0.15 mm (0.006 in)	Increase shim thickness

Drive/Driven bevel gear shims	
A	0.6 mm (0.024 in)
B	0.65 mm (0.026 in)
C	0.7 mm (0.028 in)
D	0.75 mm (0.03 in)
E	0.8 mm (0.032 in)
F	0.85 mm (0.034 in)
G	0.9 mm (0.036 in)
H	0.95 mm (0.038 in)
I	1 mm (0.04 in)
J	1.05 mm (0.042 in)
K	1.1 mm (0.044 in)
L	1.15 mm (0.046 in)

Bevel Gear Tooth Contact

After the backlash adjustment is carried out, the tooth contact must be checked as indicated below.

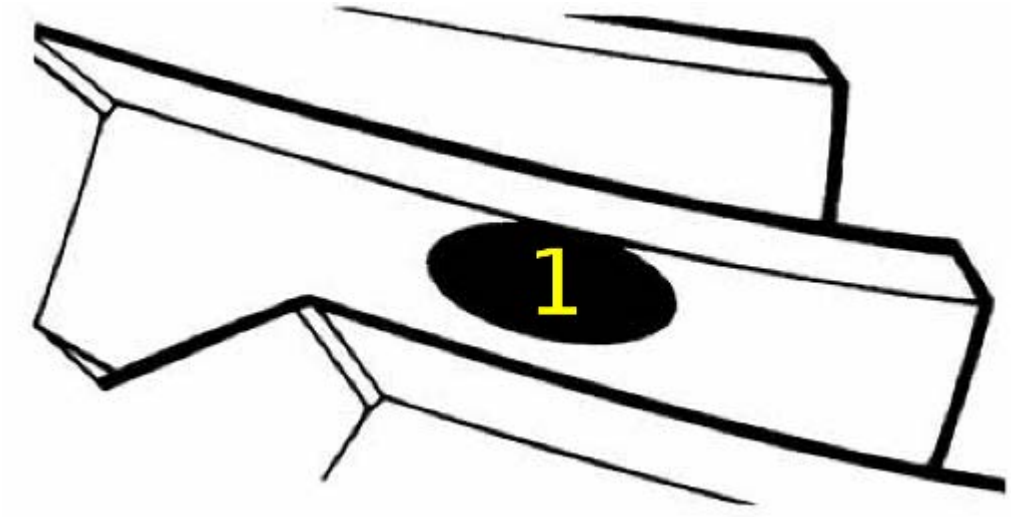
• Remove the driven bevel gear.

• Clean and degrease the teeth of the drive and driven bevel gears. Apply a coating of machinist's layout dye or paste to several teeth of the driven bevel gear.

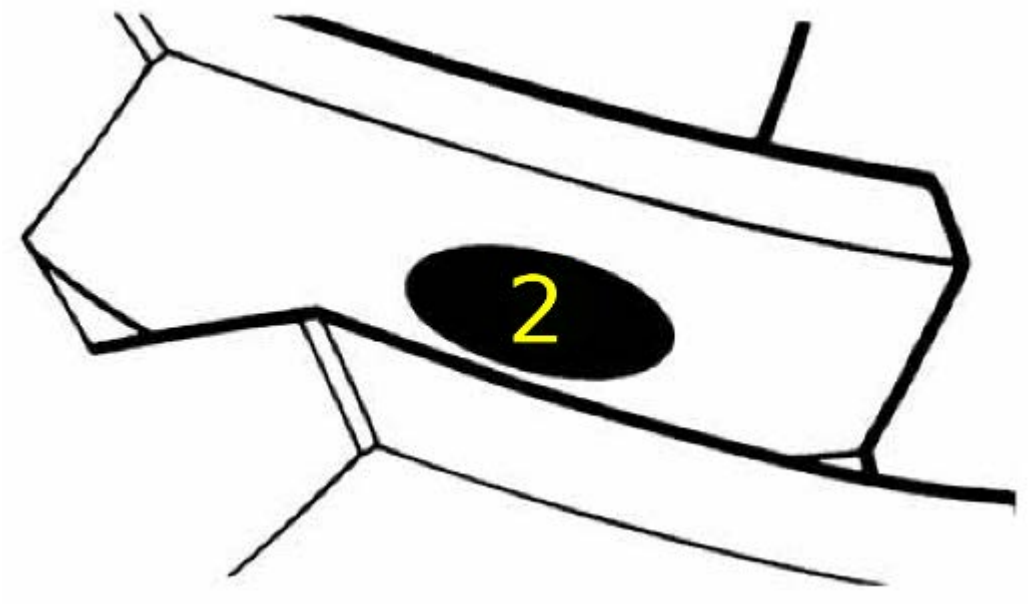
• Install the driven bevel gear.

• Rotate the rear propeller shaft several turns in both directions.

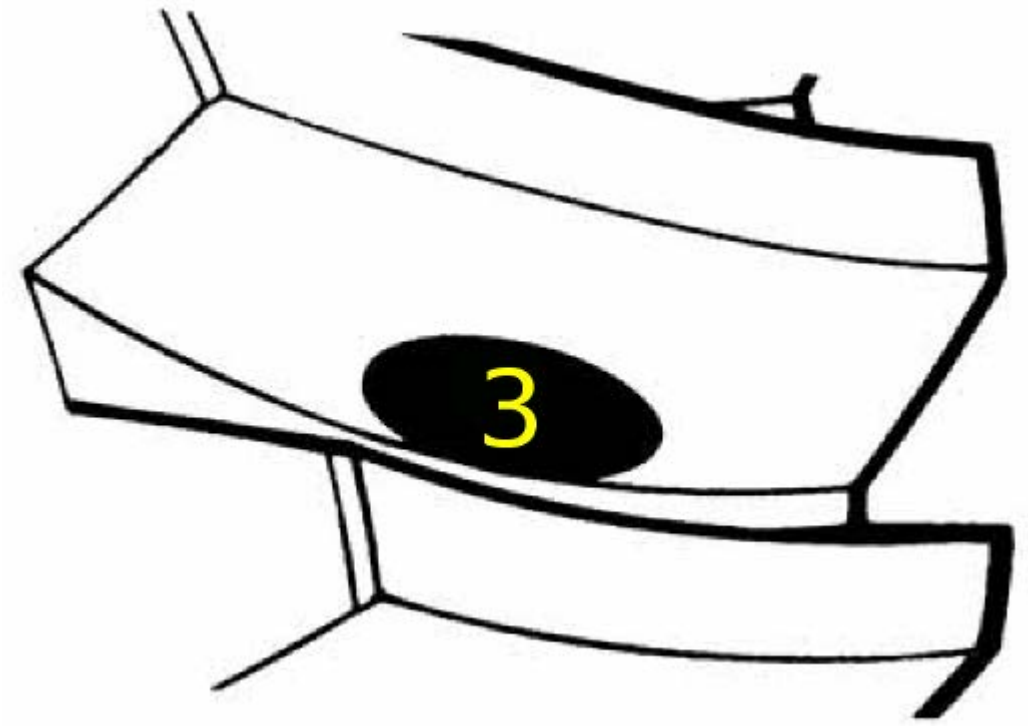
• Remove the driven bevel gear and inspect the coated teeth of the drive bevel gear. The tooth contact pattern should be as shown the examples 1, 2 and 3.



1 - Incorrect (contact at tooth top)



2 - Correct



3 -

• If tooth contact is found to be correct (example 2) complete the installation.

• If tooth contact is found to be incorrect (examples 1 and 3), the shim thickness between the drive bevel gear and driven bevel gear must be changed and the tooth contact rechecked until correct.

Tooth Contact	Drive Bevel Gear Shim Adjustment	Driven Bevel Gear Shim Adjustment
Contact at tooth top (1)	Increase shim thickness	Increase shim thickness
Contact at tooth root (3)	Reduce shim thickness	Reduce shim thickness

Make sure to check the backlash after the tooth contact has been adjusted. The tooth contact shim adjustment may have changed the backlash. Adjust the tooth contact and backlash until they are both within specification. If the correct tooth contact cannot be maintained when adjusting the backlash, replace the drive and driven bevel gears.

Installation

Output Shaft and Bevel Gears

Install the drive bevel gear shim.

Slide on the drive bevel gear.

Lubricate the new drive bevel gear lock nut threads with engine oil. Thread on the new drive bevel gear lock nut.

Hold the driven pulley with a Y-type holder.

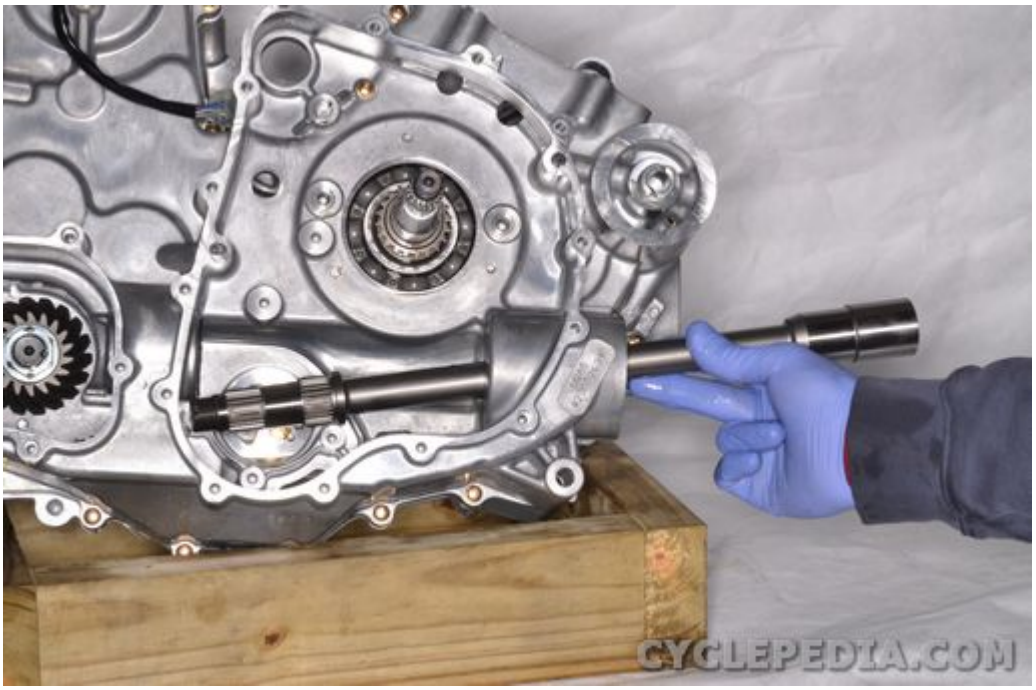
Special Tool -

Y-Type Holder: A120E00056

Tighten the drive bevel gear nut to specification with a deep well 26 mm socket.

ITEM	N-m	kgf-m	ft-lb
Drive bevel gear lock nut	140	14	100.8

Stake the drive bevel gear lock nut with a chisel and a hammer.



Slide the output shaft into the engine as shown.

Fit the driven bevel gear and shim into place.

Guide the output shaft through the driven bevel gear and shim.

The output shaft must protrude through the seal.

Install the rear propeller shaft coupler.

Lubricate the new output shaft nut threads with engine oil. Install the new output shaft nut.

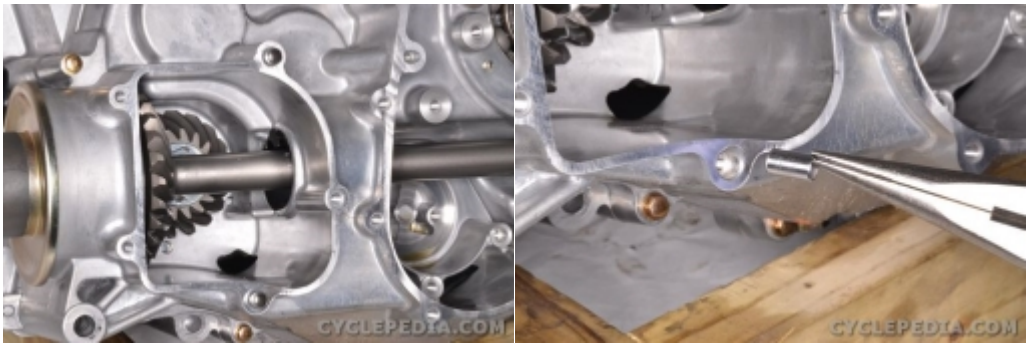
Insert the forward propeller shaft and hold it to keep the output shaft from turning.

Tighten the output shaft nut to specification with a 26 mm socket.

ITEM	N-m	kgf-m	ft-lb
Driven bevel gear lock nut	140	14	100.8

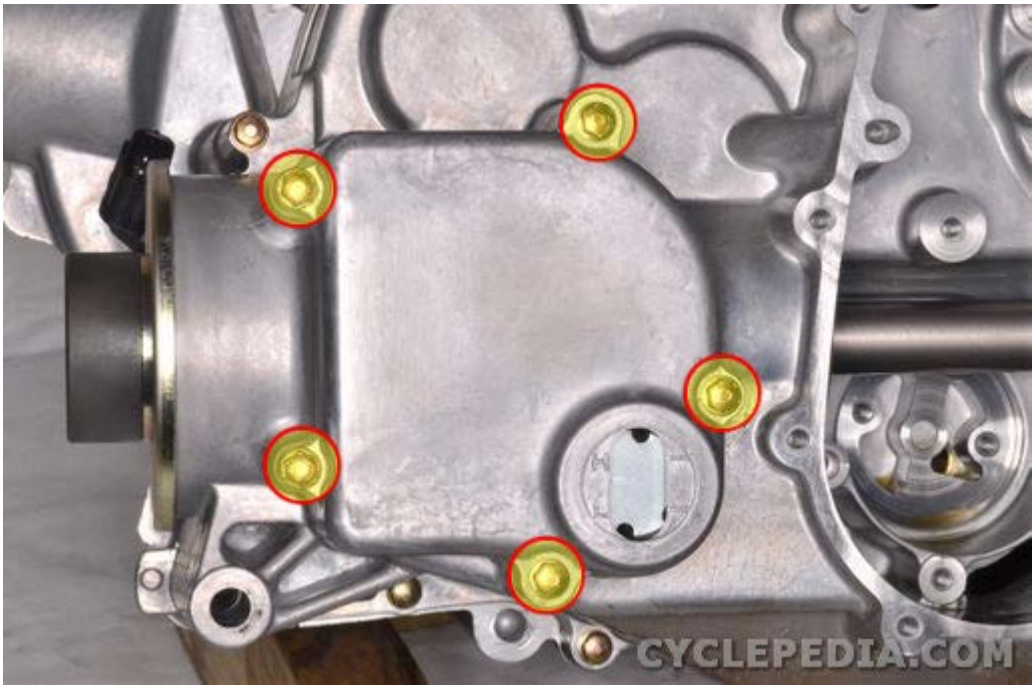
Stake the output shaft nut with a chisel and a hammer.

Bevel Gear Cover



Install two bevel gear cover dowel pins and a new gasket.

Fit the bevel gear cover into place.



Install the five bevel gear case cover bolts. Tighten the bolts evenly and securely with an 8 mm socket.

Install the engine. See the Engine Installation topic for more information.

Crankcase

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Splitting

Remove the engine from the frame. See the Engine Removal topic for more information.

Remove the following engine components:

- Cylinder Head Cover
- Camshaft
- Cylinder Head
- Cylinder and Piston
- Recoil Starter Cover
- Water Pump
- Generator Cover
- Flywheel
- Oil Pump
- Cam Chain
- Belt Case Cover

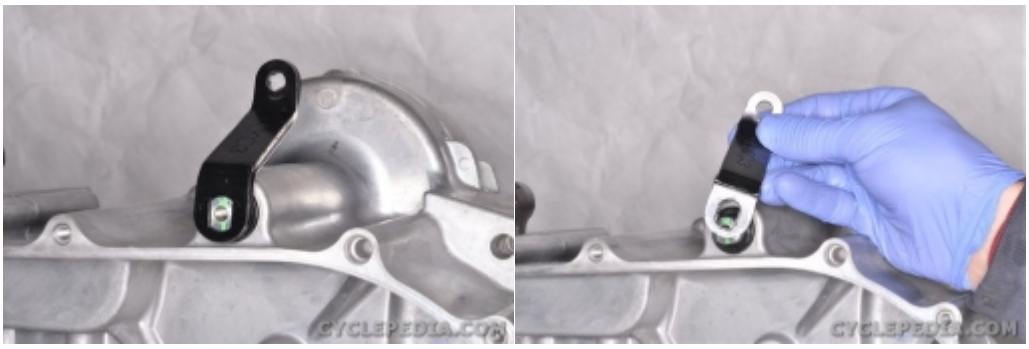
- Output Shaft and Bevel Gear
- CVT Removal
- Clutch Removal
- Starter Motor

Loosen the shift cam stopper plug with a 14 mm socket.

Remove the stopper plug, washer, spring, and stopper ball.

Inspect the shift cam stopper components and replace them as needed.

Remove the shift arm bolt with a 10 mm socket.



Remove the shift arm from the shift shaft.

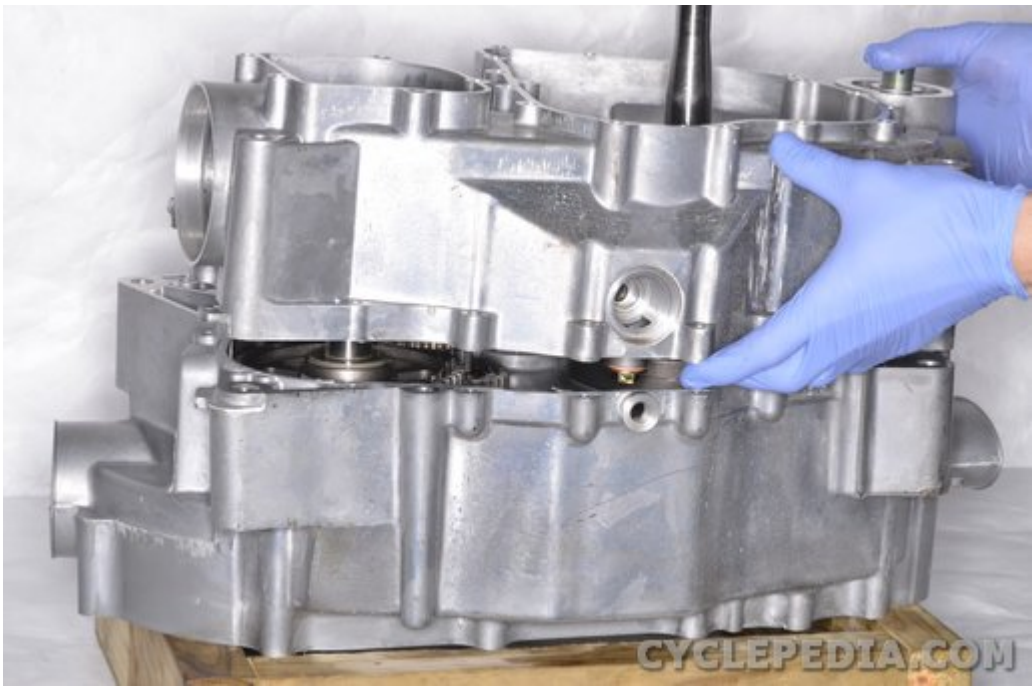
Remove the gear position indicator switch bolt with an 8 mm socket.

Remove the gear position indicator switch. Note its position so that it can be returned to its original orientation.

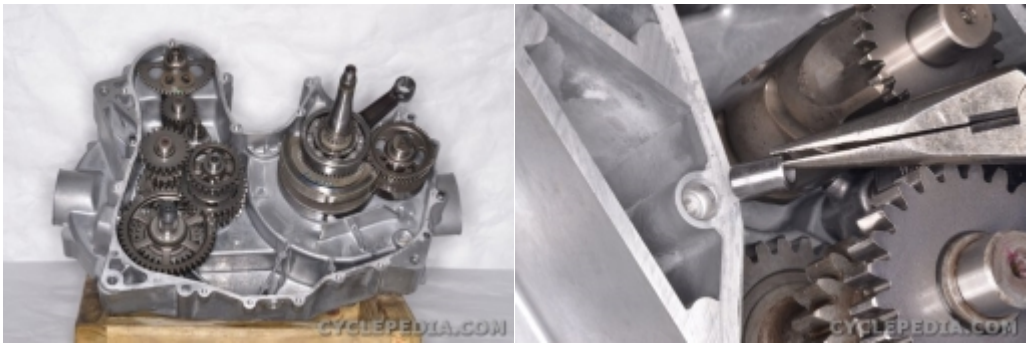
Remove the four bolts from the CVT side of the crankcase. There are three bolts on the clutch end, and one bolt on the other end. Remove the bolts with an 8 mm socket.

Loosen the 15 generator side crankcase bolts evenly and in a crisscross pattern.

Remove the generator side crankcase bolts with an 8 mm socket.



Utilize the pry points and separate the halves of the crankcases.



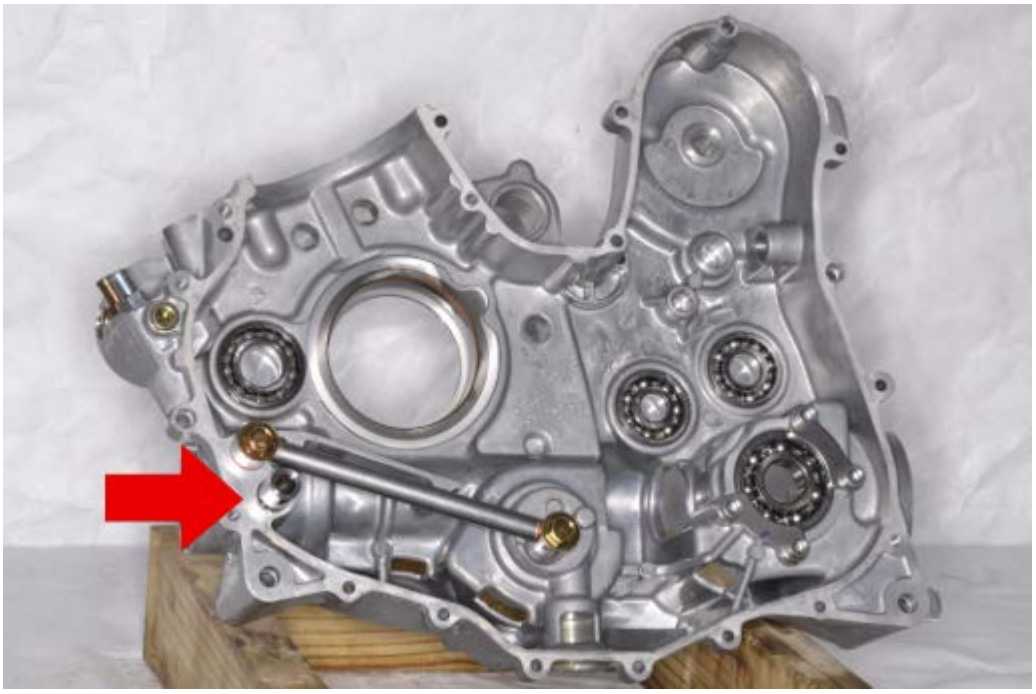
Remove the two dowel pins from the crankcase. Remove the old crankcase gasket material.

To remove the crankshaft and balancer see the Crankshaft topic.

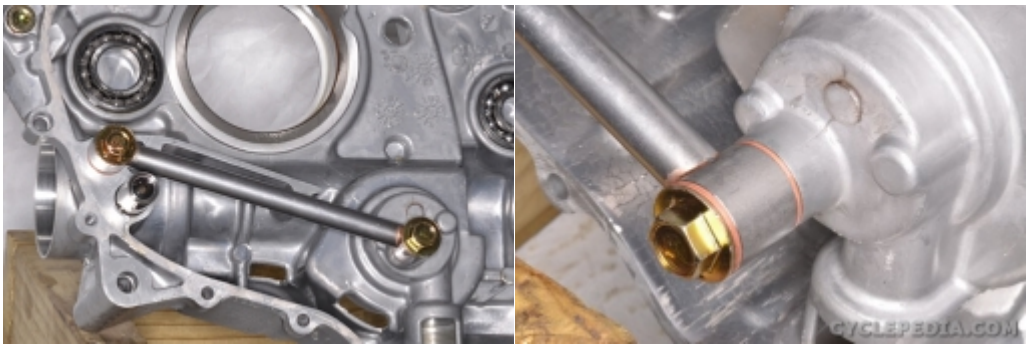
To remove the transmission see the Transmission Removal topic.

To inspect and replace the crankcase bearings see the Crankcase Bearings topic for more information.

Oil Relief Valve



The oil relief valve is located in the crankcase.



If it is necessary, remove the oil pipe; Remove the two bolts, washers (on the oil pipe), oil pipe and washers (under oil pipe).

Remove the oil relief valve from the crankcase.

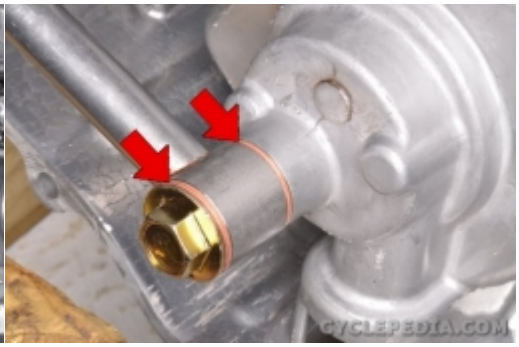
Push in on the oil relief valve piston and make sure it moves smoothly. Replace it if it sticks or refuses to move.

Discard the O-ring and replace it with a new item. Apply fresh engine oil to the new O-ring.

Fit the oil relief valve into place in the crankcase.

Assembly

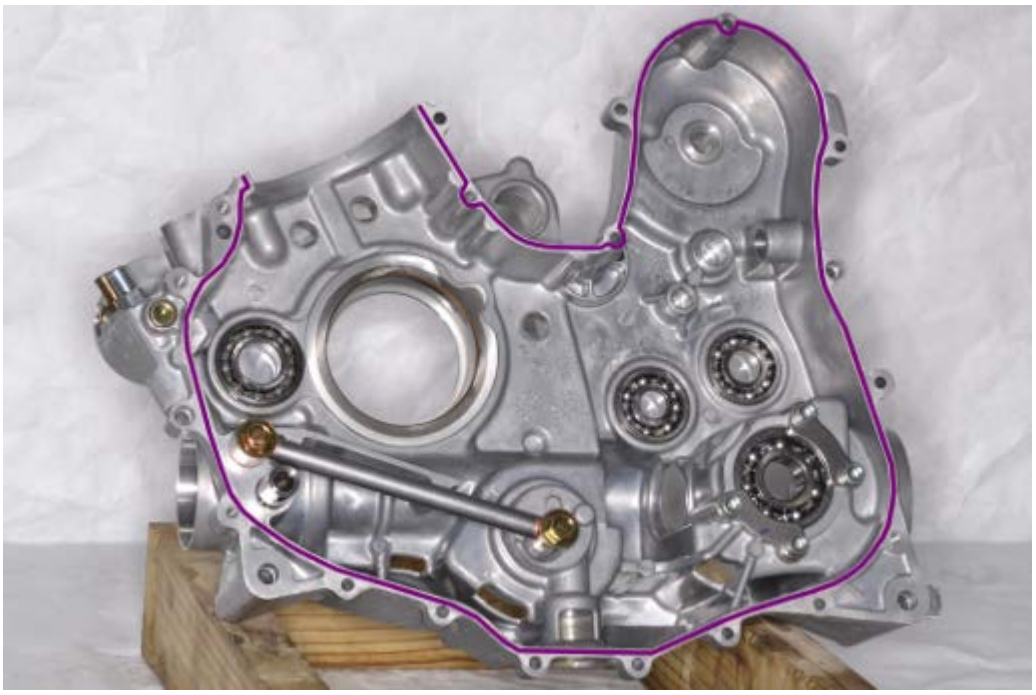
Make sure the crankcase mating surfaces are clean.



Install the inner washers on the right crankcase. Install the oil pipe with the thick side face upward. Apply clean engine oil to the bolts, then install the outer washers and two bolts.
Tighten the two bolts to the specified torque.

ITEM	N-m	kgf-m	ft-lb
Oil pipe bolt	35	3.5	25.2

Install the two dowel pins into the left crankcase half.



Apply Threebond 1215 or other equivalent sealant to the crankcase mating surface. Do not allow the sealant to get into oil passages or bearings.

The crankcases must be joined in a few minutes or the sealant will not function correctly.

Fit the generator side crankcase half onto the CVT crankcase half. Make sure the shafts line up correctly.

Insert the 15 generator side crankcase bolts. Tighten the bolts evenly and in a crisscross pattern.

Torque the 15 generator side crankcase bolts to specification with an 8 mm socket.

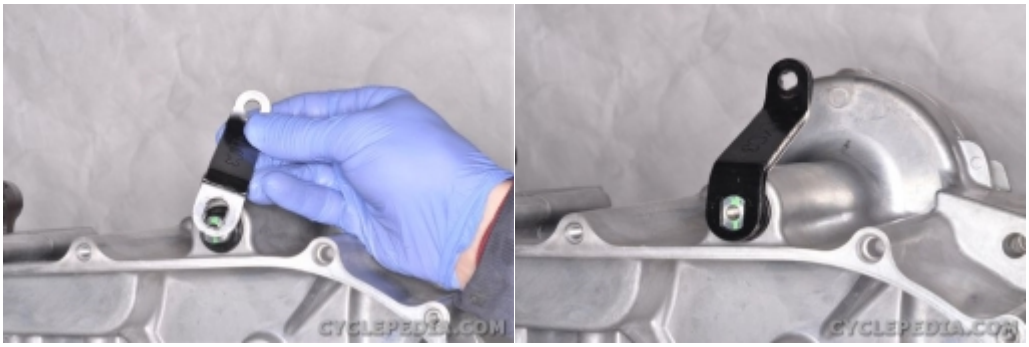
ITEM	N-m	kgf-m	ft-lb
Crankcase bolt	12	1.2	8.6

Install the four CVT side of the crankcase bolts and tighten them to specification with an 8 mm socket.

ITEM	N-m	kgf-m	ft-lb
Crankcase bolt	12	1.2	8.6

Install a new O-ring to the gear position indicator switch if needed. Lubricate the O-ring with fresh engine oil. Install the gear position indicator switch.

Install the gear position indicator switch bolt and tighten it securely with an 8 mm socket.



Install the shift arm to the shift shaft.

Install the shaft arm bolt and tighten it securely with a 10 mm socket.

Use a new sealing washer with the shift cam stopper plug.

Install the stopper plug, washer, spring, and stopper ball.

Tighten the stopper plug to specification with a 14 mm socket.

ITEM	N-m	kgf-m	ft-lb
Shift cam stopper plug	48	4.8	35

Make sure the engine shafts turn properly.

Install the following engine components:

- Starter Motor
- Clutch Installation
- CVT Installation
- Output Shaft and Bevel Gear
- Belt Case Cover
- Cam Chain
- Oil Pump
- Flywheel
- Generator Cover
- Recoil Starter Cover
- Cylinder and Piston
- Cylinder Head
- Camshaft Installation
- Cylinder Head Cover

Install the engine. See the Engine Installation topic.

Crankshaft

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Split the crankcases. See the crankcase Crankcase topic for more information.

Remove the transmission. See the Transmission Removal topic for more information.

Remove the crankshaft and balancer shaft together.

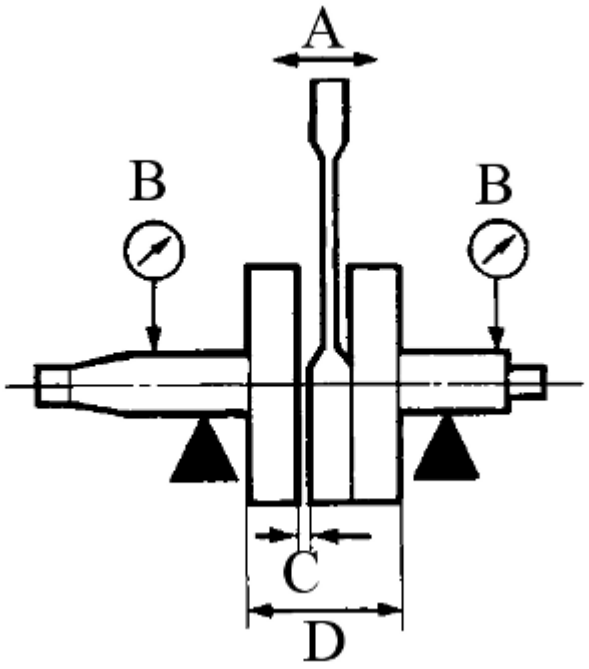
Inspection

Inspect the balancer shaft for wear and damage.

Inspect the crankshaft for wear or damage. Turn the crank bearings with a finger and make sure they turn smoothly. Replace the crankshaft if the bearings are faulty.

Measure the inside diameter of the small end of the connecting rod.

Item	Standard	Service Limit
Connecting rod small end I.D. bore	22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)



Place the crankshaft on V-blocks and measure the runout on each side with a dial gauge. Check the side clearance of the big end of the connecting rod with a feeler gauge.

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance (C)	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)
	Connecting rod big end radial clearance		0 - 0.008 (0 - 0.00032)	0.05 (0.002)
	Run out (B)		-	0.1 (0.004)
	Web width (D)		72 - 72.05 (2.88 - 2.882)	-
	Small end free play (A)		0.8 - 1.0 (0.032 - 0.04)	-

Installation

Lubricate the crankshaft and balancer bearings with fresh engine oil.

Fit the crank and balancer shafts into the crankcase together.

The line on the balancer sprocket must align with the line on the crankshaft.

Install the transmission. See the Transmission Installation topic for more information.

Assemble the crankcases. See the Crankcase topic for more information.

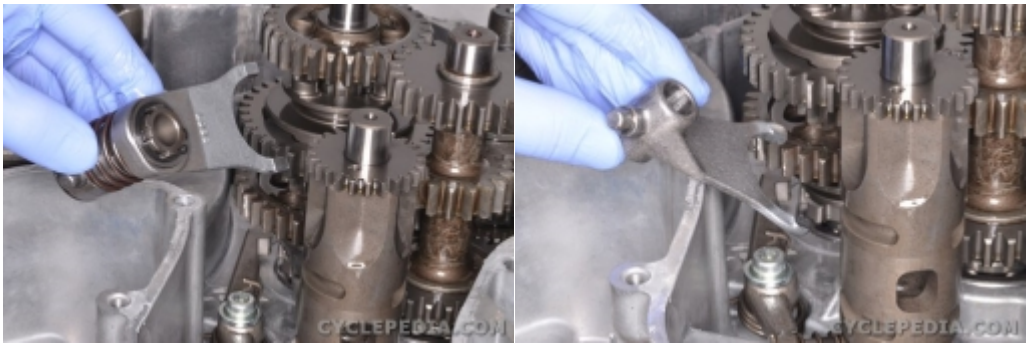
Transmission Removal

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Split the crankcases. See the Crankcase topic for more information.

Remove the shift shaft.

Remove the transmission guide bar.

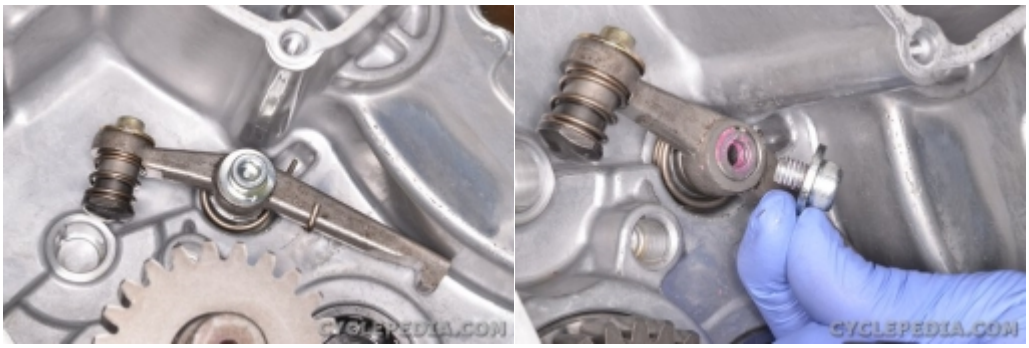


Remove the upper and lower shift forks.

Remove the shift cam.

Remove the transmission shafts together from the crankcase.

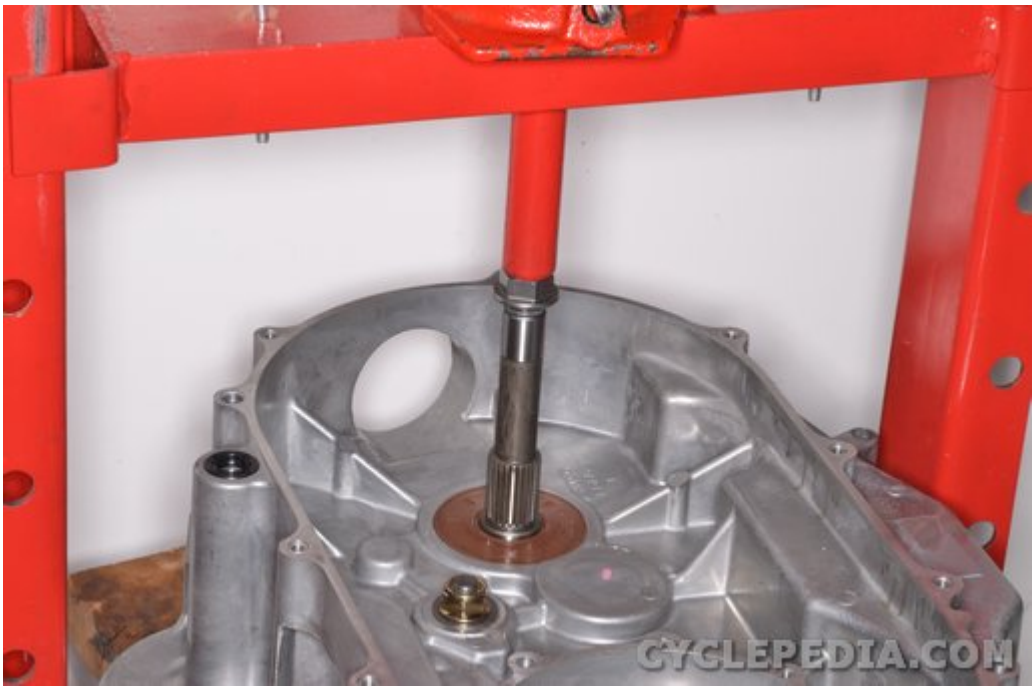
To disassemble the transmission shafts see the Transmission Shafts topic for more information.



Remove the stopper lever bolt and washer with a 6 mm Allen wrench.

Remove the stopper lever and spring.

Remove the crankshaft and balancer shaft together. See the Crankshaft for more information.



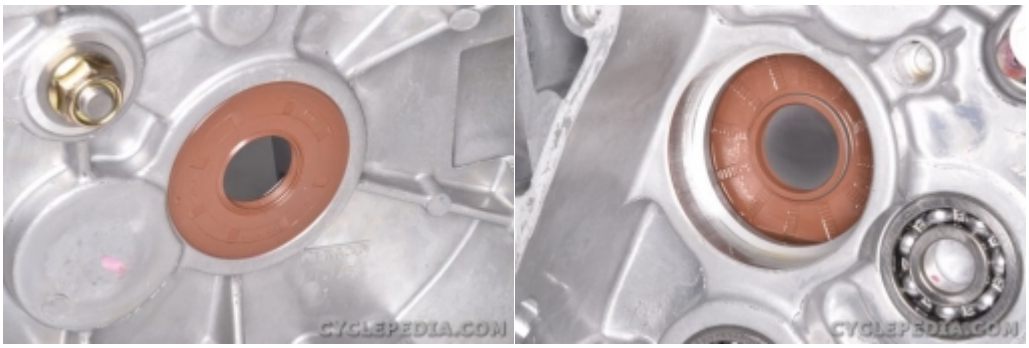
Place the nut that was removed from the driven pulley back onto the transmission drive shaft to protect the threads and begin to press the shaft out. Remove the nut before it reaches the oil seal as it will not fit through. Remove the shaft.

If the bearing comes out with the transmission drive shaft press it off as shown.

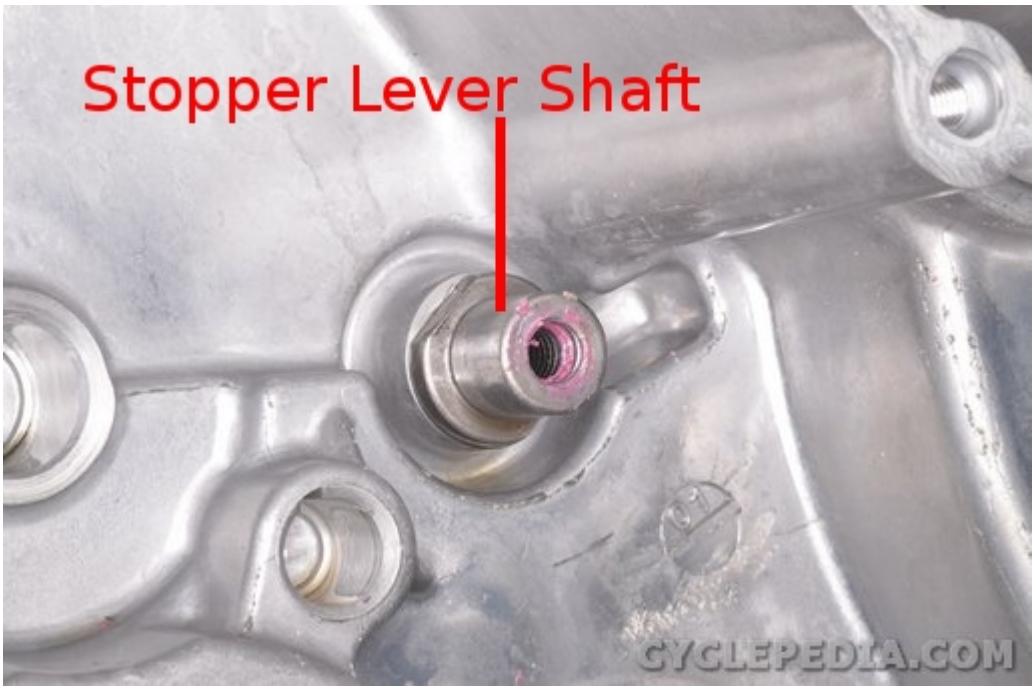
Note: Always replace the bearing if it is removed from the crankcase.

If the transmission drive shaft bearing does not come out with the shaft and needs to be replaced; remove it with a bearing puller. See the Crankcase Bearings topic for more information.

Note: Always replace the bearing if it is removed from the crankcase.



Inspect the transmission drive shaft oil seal and replace if needed.



If it is necessary to remove the stopper lever shaft use a 19 mm socket to remove the nut and washer on the other side.

Upper Shift Fork Disassembly

Remove the snap ring with snap ring pliers.

Remove the washer.

Remove the shift fork and spring.

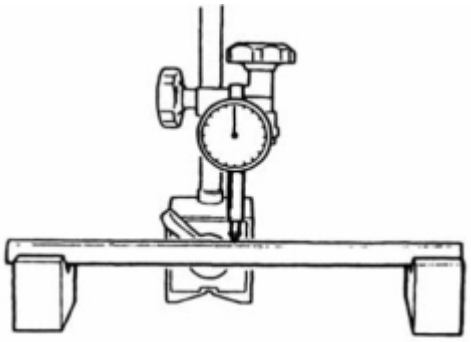
Remove the snap ring with snap ring pliers.

Remove the washer and cam pawl.

Inspection

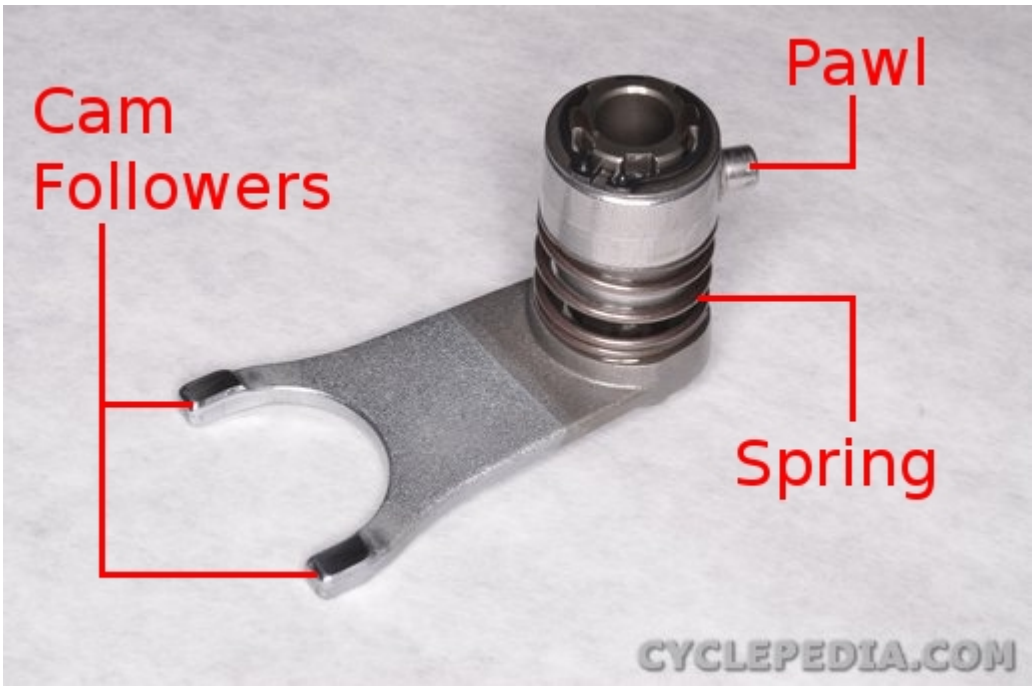
Check the stopper lever pawl for bends, damage or wear. Inspect the spring for cracks or damage.

Check the transmission drive shaft gear teeth for blue discoloration, pitting or wear.

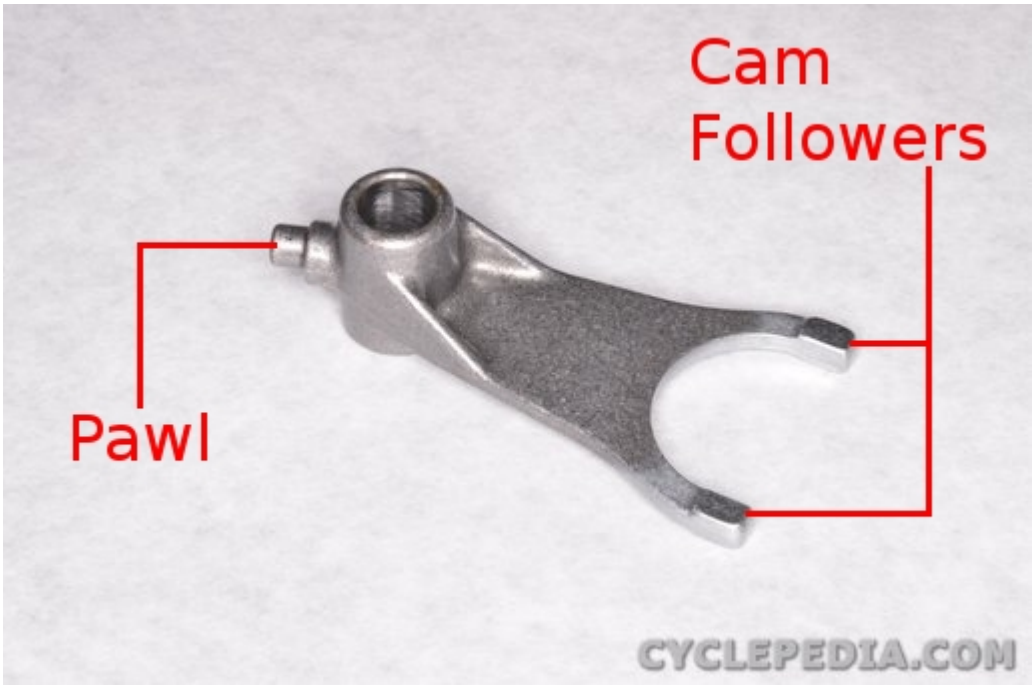


Measure the guide bar runout. Replace the bar if it is out of specification.

Item	Service Limit
Guide Bar Runout	0.03 mm (0.0012 in)



Inspect the upper shift fork cam followers, shift fork pawl and spring. If there is any damage or excessive wear replace the components as a set.



Inspect the upper shift fork cam followers and shift fork pawl. If there is any damage or excessive wear replace the part.

Check the shift cam grooves and shift cam gear. Check for wear and damage and replace if needed.

Inspect shift shaft gear and shift shaft for damage, bends or wear. Check the return spring for fatigue or damage. Replace the parts if needed.

Inspect the transmission bearings. See the Crankcase Bearings topic for more information.

To assemble the transmission see the Transmission Installation topic for more information.

Transmission Shafts

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Remove the transmission shafts from the transmission. See the Transmission Removal topic for more information.

Disassembly

When disassembling the transmission shafts be sure to keep track of the order and orientation of the parts as they come apart. Discard old snap rings. Clean all of the components using aerosol brake cleaner and a lint free cloth. Inspect the parts for visible signs of wear or damage. Replace any defective components.

Inspect all of the shifter dogs carefully for wear, especially on the outer edges. Also inspect the slots or other dogs on adjoining gears that the dogs fit into or against. Damage to the dogs or slots can cause the transmission to jump out of gear. Replace any gears that are damaged or worn even a little bit.

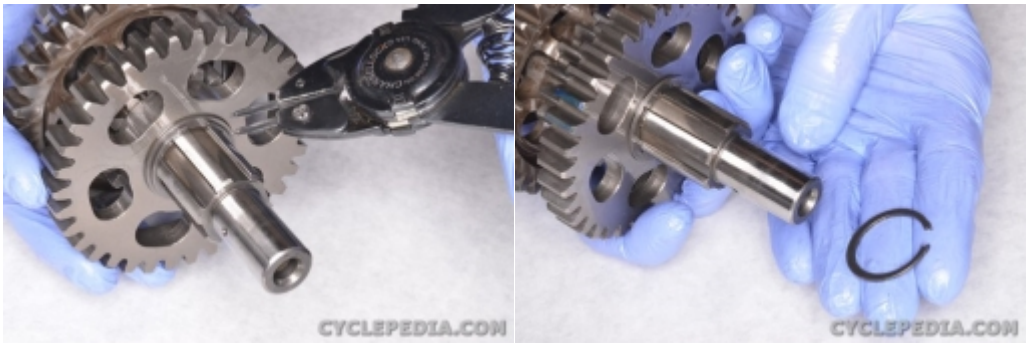
Countershaft

Remove the washer.

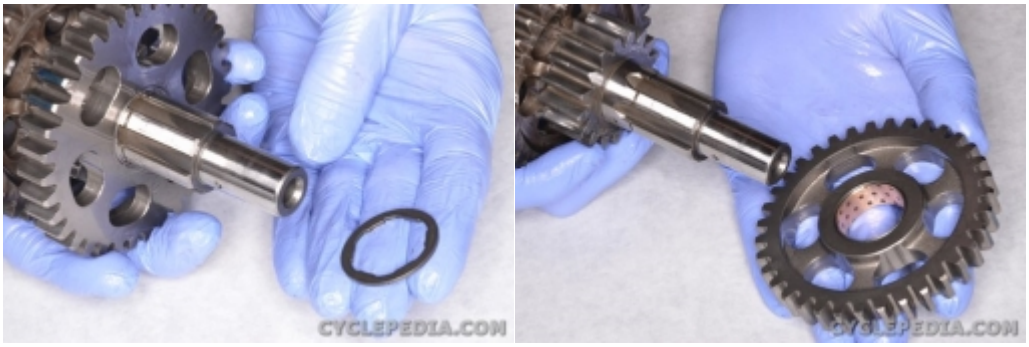
Remove the high drive gear.

Remove the bushing and washer.

Remove the high/low gear shifter.



Remove the snap ring with snap ring pliers.



Remove the washer and low drive gear.

On the other side of the countershaft; Remove the snap ring with snap ring pliers.

Remove the stopper wheel.

Remove the snap ring with snap ring pliers.

Remove the reverse gear shifter.

Remove the snap ring with snap ring pliers.

Remove the washer and reverse drive gear.

Inspect the countershaft, gear teeth and mated dogs. Check for blue discoloration, pitting or wear. Check for rounded edges, cracks or other damage. Replace as needed.

Bevel Gear Drive Shaft

Remove the thick washer.

Remove the reverse gear.

Remove the thin washer.

Inspect the gear teeth. Check for blue discoloration, pitting or wear. Replace as needed.

Inspect the needle bearing in the reverse gear. Check for wear or damage. Replace as needed.

Assembly

Use new snap rings when assembling the transmission shaft components. Install the snap ring (and thrust washer) so that the sharp edge is facing away from the gear that is putting thrust against it. The sharp edge is shown in the photo on the left.

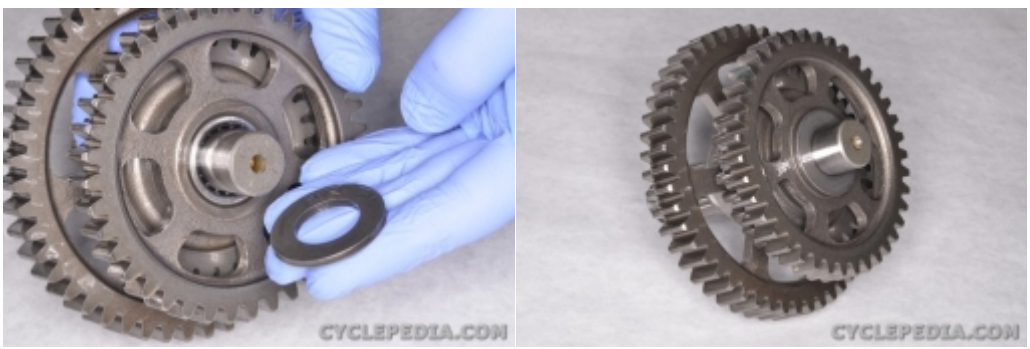
Also, make sure the snap rings are fully seated in their grooves as shown. Spread the new snap rings only enough to slide them down the shaft and into their grooves.

Note: Coat the gears and shafts lightly with fresh engine oil before installation.

Bevel Gear Drive Shaft

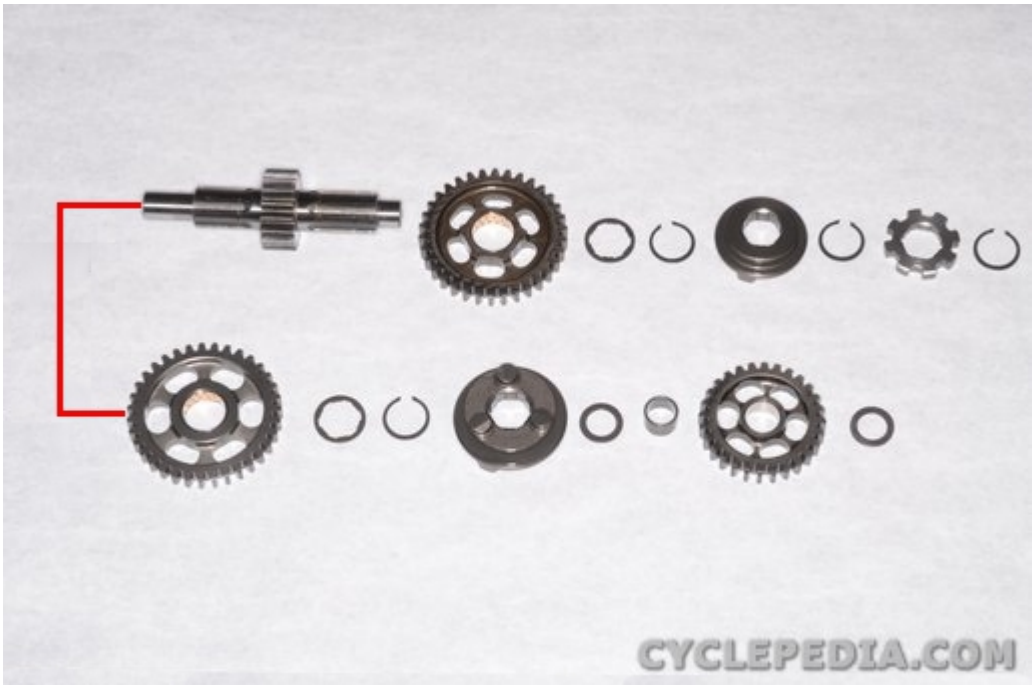
Install the thin washer on the drive shaft.

Install the reverse gear.



Install the thick washer.

Countershaft



Install the reverse drive gear and washer on the proper side of the countershaft.

Install the snap ring with snap ring pliers.

Install the reverse gear shifter.

Install the snap ring with snap ring pliers.

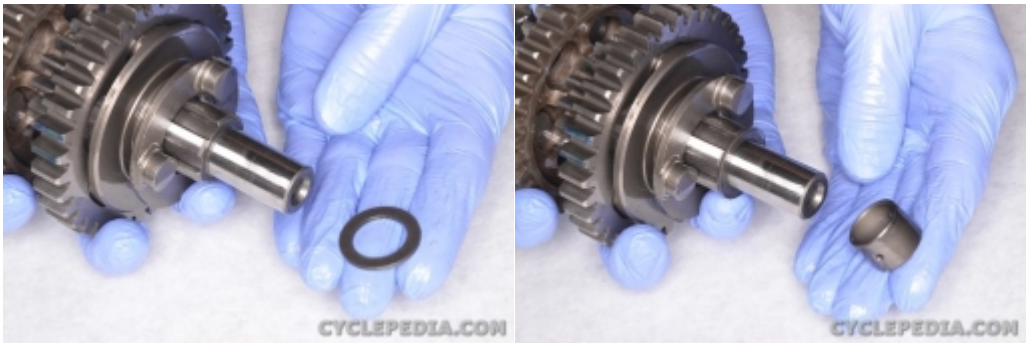
Install the stopper wheel.

Install the snap ring with snap ring pliers.

On the other side of the countershaft; Install the low drive gear and washer.

Install the snap ring with snap ring pliers.

Install the high/low gear shifter.



Install the washer and bushing.

Install the high drive gear.

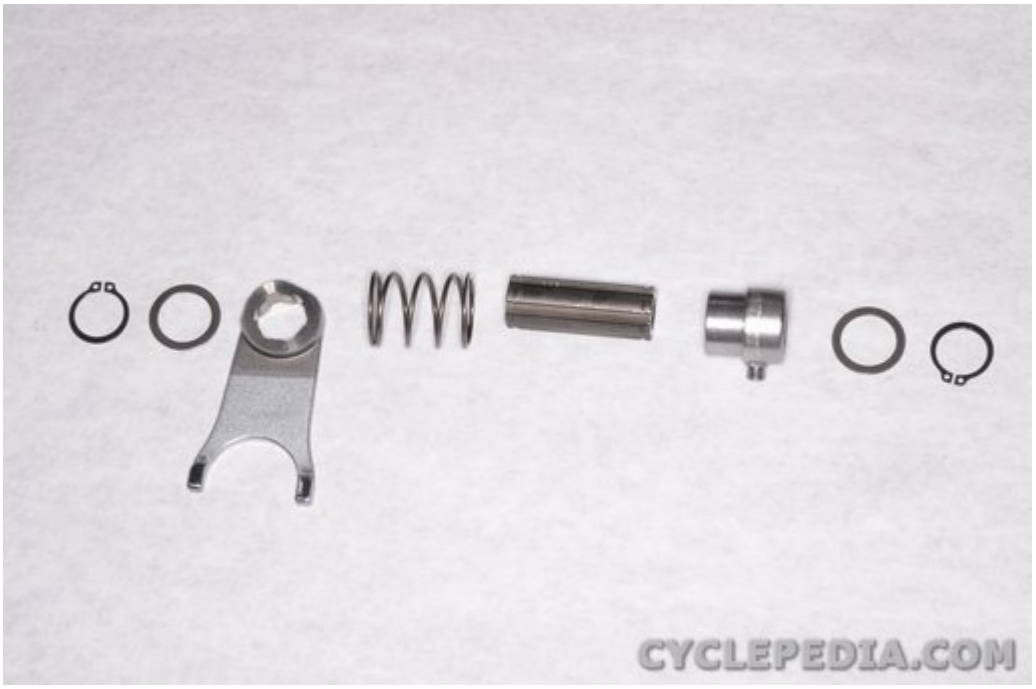
Install the washer.

To install the transmission see the Transmission Installation topic.

Transmission Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Upper Shift Fork Assembly

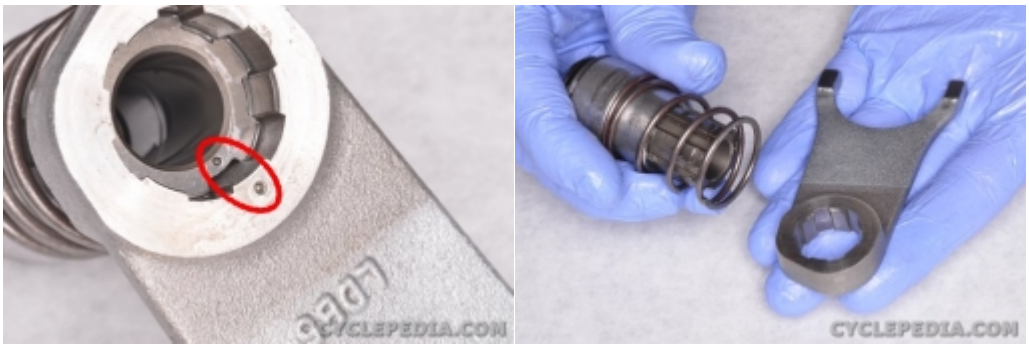


Install the cam pawl on the shaft and be sure to align the marks as shown.

Install the washer.

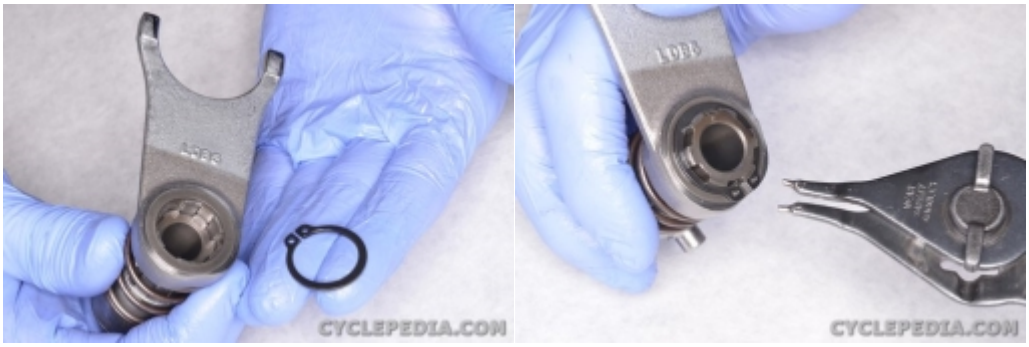
Install the snap ring with snap ring pliers.

Install the spring.



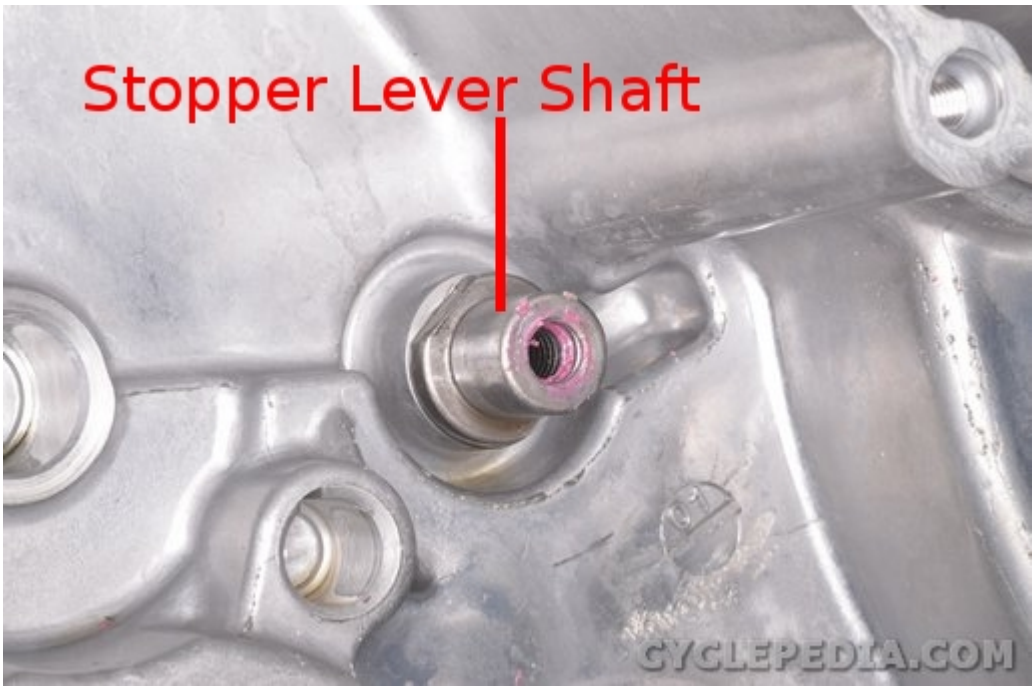
Install the shift fork on the shaft and be sure to align the marks as shown.

Install the washer.



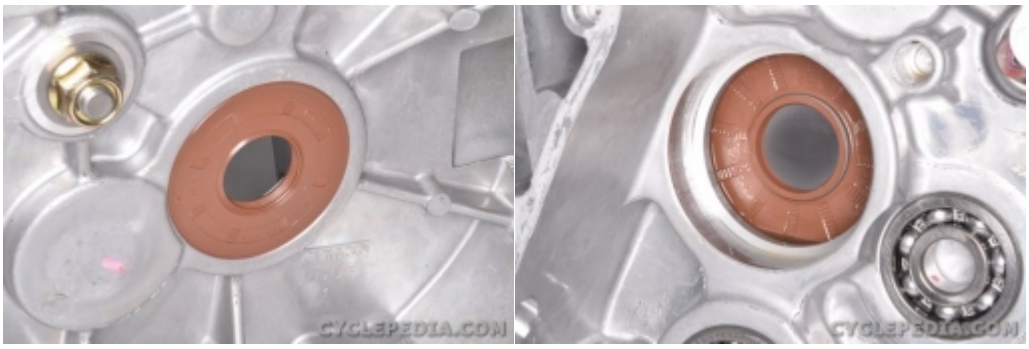
Install the snap ring with snap ring pliers.

Installation



Install the stopper lever shaft if it was removed. Install the shaft on the outside and the nut with washer on the inside. Carefully hold the stopper lever shaft with a wrench if necessary. Tighten the bolt to specification with a 19 mm socket.

Item	N-m	kgf-m	ft-lb
Stopper lever shaft nut	30	3	21.6



Apply clean engine oil to a new drive shaft oil seal lip. Install the transmission drive shaft oil seal. Use a suitable driver that is the same outside diameter as the seal.

Install the stopper lever and spring on the shaft.

Note: Hook the spring onto the hook part of the stopper lever, squeeze the spring in to the groove of the left crankcase.

Install the washer and a new stopper lever bolt. Hold the shaft nut on the other side. Tighten the bolt to specification with a 6 mm Allen wrench.

Item	N-m	kgf-m	ft-lb
Stopper lever bolt	25	2.5	18

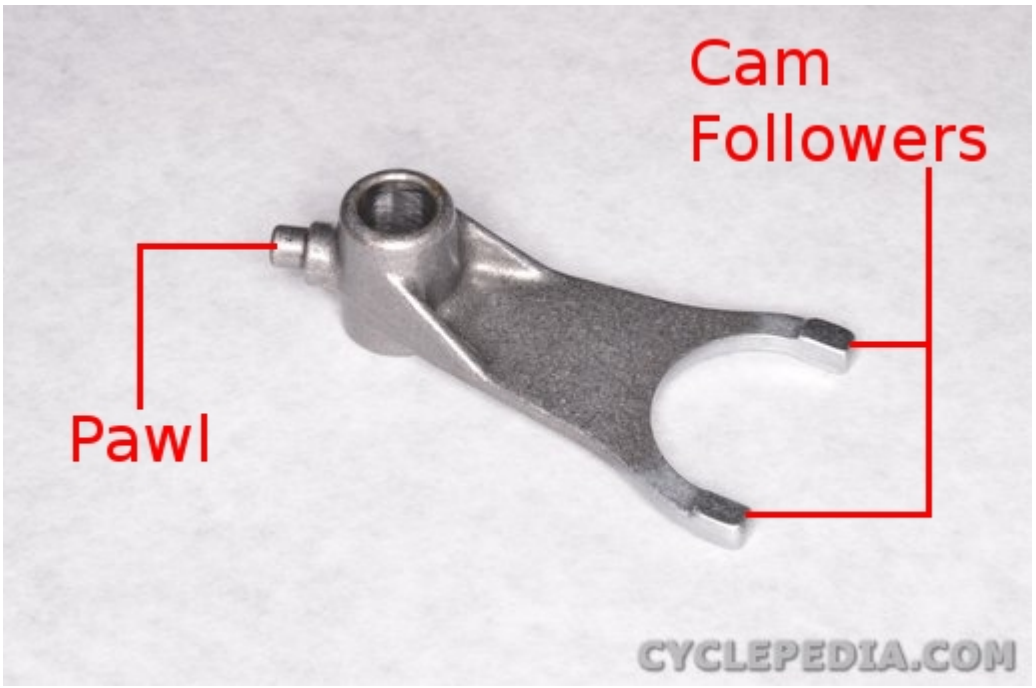
Install the transmission drive shaft bearing with a bearing driver.

Special Tool-
Bearing Driver: A120E00014
Note: Apply clean engine oil to the transmission drive shaft, countershaft and drive shaft.

Carefully press in the transmission drive shaft.

Install the transmission shafts together into the crankcase.

Apply clean engine oil to the shift cam and install it.



Apply clean engine oil to the upper and lower shift forks and pawls.

Install the lower gearshift fork into the lower shifter shift groove on the countershaft with its “LDB5” mark facing down. Fit the lower shift fork guide pin into the groove on the shift cam.

Install the upper gearshift fork into the upper shifter shift groove on the countershaft with its “LDB5” mark facing up. Fit the upper shift fork guide pin into the groove on the shift cam.

Apply clean engine oil to the transmission guide bar and install it.

Install the shift shaft. Be sure to align the shift shaft mark with the shift cam gear marks as shown. Check the transmission operation.

Install the crankshaft and balancer shaft together (if they were removed). See the Crankshaft for more information.

Assemble the crankcases. See the Crankcase topic for more information.

Crankcase Bearings

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

Inspect the crankcase bearings.

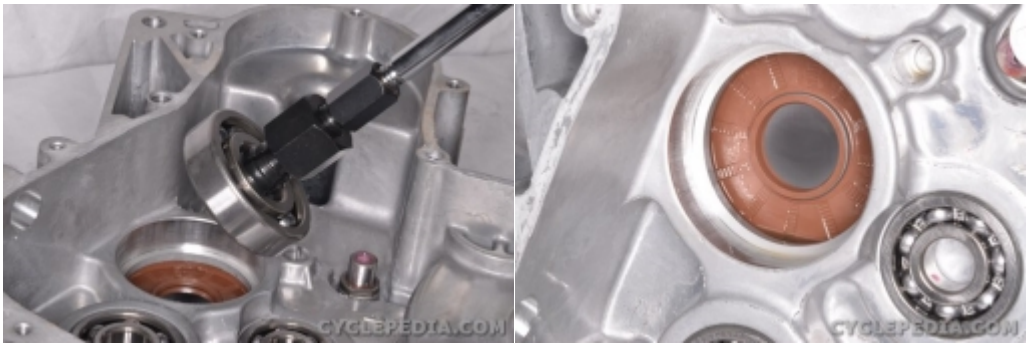
Turn the bearings with a finger. They should turn freely with out noise or binding, but also without excessive play. Make sure the outer races of the bearings are secure in the crankcase.

Replacement

Place the new bearing in the freezer at least a half hour before you plan to install them.

Remove the bearings with a suitable bearing puller.
Special Tool - Bearing Puller: A120E00037

To replace the drive shaft bearing first remove the set plates. Remove the set plate bolts with a 6 mm Allen. Install the bearing set plates after the bearing has been replaced and tighten new bolts securely with a 6 mm Allen.



Replace the oil seal if its bearing is to be replaced.

Drive in the new bearings with a suitable bearing driver that has the same outside diameter of the bearing. The manufactures markings on the bearing must face out.

Special Tool - Bearing Driver: A120E00014

5.Engine MXU700i

This chapter covers the location and servicing of the engine components for the KYMCO MXU 700i models. For the MXU 500i models see the Engine MXU 500i topic

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GENERAL INSTRUCTIONS

Lubrication System

The maintenance of lubrication system can be performed with the engine installed in the frame. Use care when removing and installing the oil pump not to allow dust and foreign matters to enter the engine

If any portion of the oil pump is worn beyond the specified service limits. replace the oil pump as an assembly. After the engine has been installed check that there are no oil leaks and that oil pressure is correct.

TROUBLESHOOTING

Oil level too low

• Natural oil consumption
• Oil leaks
• Worn or poorly installed piston rings
• Worn valve guide or seal

Oil contamination (White appearance)

• From coolant mixing with oil
- Faulty water pump mechanical seal
- Faulty head gasket
- Water leak in crankcase

No oil pressure

• Oil level too low

• Oil pump drive chain broken
• Oil pump drive sprocket broken
• Oil pump damaged (pump shaft)
• Internal oil leak

Low oil pressure

• Pressure relief valve stuck open
• Clogged oil filter and strainer screen
• Oil pump worn or damaged
• Internal oil leak
• Incorrect oil being used
• Oil level too low

High oil pressure

• Pressure relief valve stuck closed
• Plugged oil filter, gallery, or metering orifice
• Faulty oil pump

Seized engine

• No or low oil pressure
• Clogged oil orifice/passage
• Internal oil leak
• Non-recommended oil used

Oil contamination

• Deteriorated oil
• Faulty oil filter
• Worn piston ring (White appearance with water or moisture)
- Damaged water pump mechanical seal
- Damaged head gasket

- Oil relief not frequent enough

Cylinder Head, Camshaft, and Valves

• The cylinder head can be serviced with the engine installed in the frame. Coolant in the radiator and water jacket must be drained.

• When assembling, apply molybdenum disulfide grease or engine oil to the valve guide, movable parts, and valve arm sliding surfaces for initial lubrication.

• The valve rocker arms are lubricated by engine oil through the engine oil passages. Clean and unclog the oil passages before assembling the cylinder head.

• After disassembly, clean the removed parts and dry them with compressed air before inspection.

• After removal, mark and arrange the removed parts in order. When assembling, install them in the reverse order of removal. The remove components should be returned to their original positions.

TROUBLESHOOTING

• The poor cylinder head operation can be diagnosed by a compression test or by tracing engine top-end noises.

Poor performance at idle speed

• Compression too low

Compression too low

• Incorrect valve clearance adjustment
• Burned or bent valves
• Incorrect valve timing
• Broken valve spring
• Poor valve and seat contact
• Leaking cylinder head gasket
• Warped or cracked cylinder head
• Poorly installed spark plug

Compression too high

• Excessive carbon build-up in combustion chamber

Abnormal noise

• Incorrect valve clearance adjustment
• Sticking valve or broken valve spring
• Damaged or worn camshaft
• Worn cam chain tensioner
• Worn camshaft and rocker arm

White smoke from exhaust muffler

• Worn valve stem or valve guide
• Damaged valve stem oil seal

Cylinder and Piston

• The cylinder and piston can be serviced with the engine installed in the frame.

• After disassembly, clean the removed parts and dry them with compressed air before inspection.

• When installing the cylinder, use a new cylinder gasket and make sure that the dowel pins are correctly installed.

TROUBLESHOOTING

When hard starting or poor performance at low speed occurs, check the crankcase breather for white smoke. If white smoke is found, it means that the piston rings are worn, stuck or broken.

Compression too low or uneven compression

• Worn, stuck or broken piston rings
• Worn or damaged cylinder and piston

Compression too high

• Excessive carbon build-up in combustion chamber or on piston head.

Excessive smoke from exhaust muffler

• Worn or damaged piston rings
• Worn or damaged cylinder and piston

Abnormal noisy piston

• Worn cylinder, piston and piston rings
• Worn piston pin hole and piston pin
• Incorrectly installed piston

Specifications

General Specifications

Model No. MXU 500i		LDA0CA
Model No. MXU 700i		LAADAA(US)
Overall length		2210 mm
Overall width		1220 mm
Overall height		1265 mm
Wheel base		1297 mm
Engine type		4 stroke D.O.H.C.
Displacement	MXU 500i	498.5 cc
	MXU 700i	694.6 cc
Fuel used		92# nonleaded gasoline
Dry weight	Front wheel	170 kg
	Rear wheel	159 kg
	Total	329 kg
Curb weight	Front wheel	178 kg
	Rear wheel	169 kg
	Total	349 kg
Tires (standard models)	Front wheel	AT25 X 8-12
	Rear wheel	AT25 X 10-12
Ground clearance		265 mm
Min. turning radius		3450 mm

Tires (LE models)	Front wheel	AT 26 X 9-14
	Rear wheel	AT 26 X 11-14

Starting system	Electric

Type		Gasoline, 4-stroke
Cylinder arrangement		Single cylinder
Combustion chamber type		Semi-sphere
Valve arrangement	MXU 500i	DOHC, chain drive
	MXU 700i	SOHC, chain drive
Bore x stroke	MXU 500i	92 X 75 mm
	MXU 700i	102 X 85 mm
Compression ratio		10.5:1
Compression pressure		15 kg/cm^2 (213 psi)
Intake valve (at 1mm lift) MXU 500i	Opens	-1° BTDC
	Closes	48° ABDC
Exhaust valve (at 1mm lift) MXU 500i	Opens	45° BBDC
	Closes	5° ATDC
Intake valve (at 1mm lift) MXU 700i	Opens	-5° BTDC
	Closes	54° ABDC
Exhaust valve (at 1mm lift) MXU 700i	Opens	50° BBDC
	Closes	3° ATDC
Valve clearance (cold)	Intake	0.1 mm
	Exhaust	0.1 mm
Idle speed (rpm)	MXU 500i	1400 ± 100 rpm
	MXU 700i	1500 ± 100 rpm
Cooling type		Liquid cooled

Lubrication type	Forced pressure & Wet sump
Oil pump type	Trochoid
Oil filter type	Full-flow filtration
Oil capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)
Air cleaner type & No	Wet type element
Fuel capacity	16.5 L

Throttle body	TYPE	KYMCO PTA1
	VENTURE DIA	38 mm
Ignition System	Type	Full transistor digital ignition
	Ignition timing	5° at idle rpm (MXU 500i) 10° at idle rpm (MXU 700i)
	Spark plug	CR7E (NGK)
	Spark plug gap	0.6~0.7 mm
Battery	Capacity	12V18AH

Clutch type		Wet, centrifugal automatic
Clutch operation system		Automatic (V-belt)
Primary reduction system		V-belt
Secondary reduction system		Shaft drive
Forward drive high radio		8.770~30.067
Forward drive low radio		16.279~55.814
Reverse drive ratio		13.381~45.878
FR/RR tire rolling circumference		1995/1995
Tire pressure	Front (standard)	0.35 kgf/cm^2 (35 Kpa, 5.0 psi)
	Rear (standard)	0.32 kgf/cm^2 (32Kpa, 4.5 psi)
	Front (LE)	0.7 kgf/cm^2 (70 Kpa, 10 psi)
	Rear (LE)	0.97 kgf/cm^2 (97 Kpa, 14 psi)
Turning angle	Left	41°
	Right	41°

Brake system type	Front	Disk brake
	Rear	Disk brake
Suspension type	Front	Dual A-Arm
	Rear	Dual A-Arm

Lubrication Specifications

ITEM		STANDARD	SERVICE LIMIT
Recommended engine oil		KYMCO 4-stroke oil or equivalent motor oil API service classification SJ Viscosity: SAE 5W-50	—
Oil pump rotor	Tip clearance	0.15 max	0.2
	Body clearance	0.15 - 0.2	0.25
	Side clearance	0.04 - 0.09	0.12

Lubrication type	Forced pressure & Wet sump
Oil pump type	Trochoid
Oil filter type	Full-flow filtration
Oil capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)

Front gear box oil	
Recommended oil:	SAE 80
At disassembly:	270 cc
At change:	250 cc
Rear gear box oil	
Recommended oil:	SAE 80
At disassembly:	250 cc
At change:	230 cc

Fuel Injection Specifications

ITEM		SPECIFICATIONS
Throttle body identification number		PTA1
Throttle cable free play		3 ~ 5 mm
Fuel injector resistance (at 20°C/68°F)		10.6 - 15.9 Ω
Fuel pump resistance (at 20°C/68°F)	Float at full position	About 101 Ω
	Float at empty position	About 3 Ω
Fuel pump standard pressure (at 80 L/Hr)		300 ± 10 kPa (43.5 psi)
Water temperature sensor resistance	At -20°C/-4°F	28.6 KΩ
	At 40°C/104°F	1.46 KΩ/3.51 KΩ ±1 0%
	At 100°C/212°F	0.176 KΩ
T-MAP sensor resistance (20°C) (1 and 2 pins)		1613 - 2544 Ω
Inductive ignition coil		Primary: 0.55-0.75 Ω
Throttle position sensor (TPS) resistance (at 20°C/68°F)		3500-6500 Ω (1.2 pin)
Crank position sensor resistance		96 -144 Ω
Roll sensor voltage	Standard	0.4 -1.4 V
	Over 65° (fall down)	3.7- 4.4 V

Engine Specifications

MXU 500i Engine

Item		Standard mm (in)	Service Limit
Valve clearance (cold)	IN	0.1 mm (0.004 in)	-
	EX	0.1 mm (0.004 in)	-
Cylinder head compression pressure		15 kg/cm^2(1500 kPa, 213 psi)	-
Cylinder head warpage		-	0.05 (0.002)

Camshaft runout		-	0.05 (0.002)
Camshaft cam height	IN	37.2614 (1.4905)	37.11 (1.4844)
	EX	37.0084 (1.4803)	36.86(1.4744)
Valve rocker arm I.D.	IN	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)
	EX	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)
Valve rocker arm shaft O.D.	IN	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)
	EX	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)
Rocker arm to shaft clearance		0.009 - 0.042 (0.0004 - 0.0017)	0.1 (0.004)
Valve stem O.D.	IN	4.975 - 4.99 (0.199 - 0.1996)	4.925 (0.197)
	EX	4.955 - 4.97 (0.1982 - 0.1988)	4.915 (0.1966)
Valve guide I.D.	IN	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
	EX	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	0.08 (0.0032)
	EX	0.03 - 0.057 (0.0012 - 0.0023)	0.1 (0.004)

Item			Standard mm (in)	Service Limit
Cylinder	I.D.		92.005 - 92.015 (3.6802 - 3.6806)	92.1 (3.684)
	Warpage		0.01 (0.0004)	0.05 (0.002)
	Taper		0.01 (0.0004)	0.1 (0.004)
	Out-of-round		0.01 (0.0004)	0.1 (0.004)
Piston	Ring-to-groove clearance	top	0.03 - 0.065 (0.0012 - 0.0026)	0.08 (0.003)
		Second	0.015 - 0.05 (0.0006 - 0.002)	0.065 (0.0026)
	Ring end gap	top	0.15 - 0.3 (0.006 - 0.012)	0.5 (0.02)
		Second	0.03 - 0.45 (0.012 - 0.018)	0.65 (0.026)
		Oil side rail	0.2 - 0.7(0.008 - 0.028)	1 (0.04)
	Piston O.D.		91.96 - 91.98 (3.6784 - 3.6793)	91.9 (3.676)
	Piston O.D. measuring position		10 mm from bottom of skirt	-
	Piston-to-cylinder clearance		0.01 - 0.045 (0.0004 - 0.0018)	0.1 (0.004)
	Piston pin hole I.D.		22.002 - 22.008 (0.8801 -	22.04

		0.8803)	(0.8816)
Piston pin O.D.		21.994 - 22 (0.8798 - 0.88)	21.96 (0.8784)
Piston-to-piston pin clearance		0.002 - 0.014 (0.0001 - 0.0006)	0.02 (0.001)
Connecting rod small end I.D. bore		22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

Item	Standard mm (in)	Service Limit
Drive belt width	34.1 (1.364)	30.8 (1.232)
Clutch shoe thickness	1.5 (0.06)	1 (0.04)
Driven pulley spring	124.3 (4.972)	121.3 (4.852)
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)
	Connecting rod big end radial clearance		0 - 0.008 (0 - 0.00032)	0.05 (0.002)
	Runout		-	0.1 (0.004)

MXU700i Engine

Item		Standard mm (in)	Service Limit
Valve clearance (cold)	IN	0.1 mm (0.004 in)	-
	EX	0.18 mm (0.007 in)	-
Cylinder head compression pressure		15 kg/cm^2(1500 kPa, 213 psi)	-
Cylinder head warpage		-	0.05 (0.002)
Camshaft runout		-	0.05 (0.002)
Camshaft cam height	IN	37.9809 (1.4953)	-

	EX	37.3412 (1.4701)	-
Valve rocker arm I.D.	IN	12 - 12.018 (0.4724 - 0.4731)	-
	EX	12 - 12.018 (0.4724 - 0.4731)	-
Valve rocker arm shaft O.D.	IN	11.975 - 11.987 (0.471 - 0.4719)	-
	EX	11.975 - 11.987 (0.471 - 0.4719)	-
Rocker arm to shaft clearance		0.009 - 0.042 (0.0004 - 0.0017)	0.1 (0.004)
Valve stem O.D.	IN	5.975 - 5.99 (0.235 - 0.2358)	-
	EX	5.955 - 5.97 (0.2344 - 0.2350)	-
Valve guide I.D.	IN	6 - 6.012 (0.2362 - 0.2367)	-
	EX	6 - 6.012 (0.2362 - 0.2367)	-
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	-
	EX	0.03 - 0.057 (0.0012 - 0.0023)	-

Item		Standard
Valve Spring Free Length (IN and EX)	INNER	43 mm
	OUTER	37.5 mm

Item			Standard mm (in)	Service Limit
Cylinder	I.D.		102 - 102.01 (4.0158 - 4.0161)	102.1 (4.0197)
	Warpage		0.01 (0.0004)	0.05 (0.002)
	Taper		0.01 (0.0004)	0.1 (0.004)
	Out-of-round		0.01 (0.0004)	0.1 (0.004)
Piston	Ring-to-groove clearance	top	0.03 - 0.07 (0.0012 - 0.0028)	0.08 (0.003)
		Second	0.02 - 0.06 (0.0008 - 0.0024)	0.065 (0.0026)
	Ring end gap	top	0.25 - 0.35 (0.0098 - 0.0138)	0.5 (0.02)
		Second	0.7 - 0.9 (0.0276 - 0.0354)	-
		Oil side rail	0.2 - 0.7(0.008 - 0.028)	1 (0.04)
	Piston O.D.		101.975 - 101.985 (4.0148 - 4.0152)	-

	Piston O.D. measuring position	10 mm from bottom of skirt	-
	Piston-to-cylinder clearance	0.015 - 0.035 (0.0006 - 0.0014)	0.1 (0.004)
	Piston pin hole I.D.	23.006 - 23.012 (0.9057 - 0.9060)	23.04 (0.9071)
Piston pin O.D.		22.997 - 23 (0.9053 - 0.9055)	
Piston-to-piston pin clearance		0.006 - 0.015 (0.0002 - 0.0006)	0.02 (0.001)
Connecting rod small end I.D. bore		22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

Item	Standard mm (in)	Service Limit
Drive belt width	34.1 (1.364)	30.8 (1.232)
Clutch shoe thickness	1.5 (0.06)	1 (0.04)
Driven pulley spring	124.3 (4.972)	121.3 (4.852)
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)
	Connecting rod big end radial clearance		0 - 0.008 (0 - 0.00032)	0.05 (0.002)
	Runout		-	0.1 (0.004)

Cooling System Specifications

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.4 liter, 2.54 US qt. (MXU700i) 1.95 liter, 2.06 US qt. (MXU500i)
	Reserve tank	0.3 liter, 0.32 US qt.

Radiator cap relief pressure		90 kPa (0.9 kgf/cm^2, 12.8 psi)
Thermostat	Begin to open	69 - 73°C (156 - 163°F)
	Fully open	85°C (185°F)
	Valve lift	8 mm (0.3 in) minimum
Standard coolant concentration		1:1 mixture with soft water

COOLANT GRAVITY CHART											
	Temperature °C										
Coolant Concentration	0	5	10	15	20	25	30	35	40	45	50
5%	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.009	0.997
10%	1.018	1.107	1.017	1.016	1.015	1.014	0.013	1.011	1.009	1.007	1.005
15%	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20%	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25%	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30%	1.053	1.051	1.051	1.049	1.047	1.045	1.043	1.041	1.038	1.035	1.032
35%	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40%	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45%	1.080	1.078	1.076	1.074	1.072	1.069	1.056	1.063	1.062	1.057	1.054
50%	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55%	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60%	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

Wheel and Brake Specifications

Item		Standard		Service Limit
Wheel rim run out	Radial	—		2 mm (0.08 in)
	Axial	—		2 mm (0.08 in)
Toe in		0~15 mm	(0~0.59 in)	—

Item	Standard mm (in)	Service Limit

Brake disk thickness	FR: 4.0 (0.156) RR: 5.0 (0.195)	FR: 3 (0.12) RR: 4 (0.156)
Brake disk runout	—	0.3 (0.012)
Brake fluid	DOT-4	—

Electrical Specifications

ITEM			SPECIFICATIONS
Battery	Capacity		12V - 18 Ah
	Current leakage		0.5 Ma max.
	Voltage (20°C/68°F)	Full charged	13.0 - 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.8 A/5 - 10 h
		Quick	9 A/1 h
Alternator	Capacity MXU 500i		310 - 400 W/5000 rpm
	Capacity MXU 700i Standard		308 W/5000 rpm
	Capacity MXU 700i LE		500 W/5000 rpm
Charging coil resistance (20°C/68°F)			0.1 - 0.3 Ω

Item	Standard
Spark plug	NGK-CR7E
Spark plug gap	0.6 - 0.7 mm (0.024 - 0.028 in.)
Ignition system	Full transistor digital ignition
Ignition timing	5° at idle rpm (MXU 500i) 10° at idle rpm (MXU 700i)

Spark Pug Type	NGK CR7E
Spark Plug Cap	4000-6000 ohms
Ignition Coil Resistance (primary)	Less than 1 ohm (terminal to terminal)
Ignition Coil (primary/CDI) Peak Voltage	250-375 DC volts (black/yellow to black)
Crank Position Sensor Resistance	90-110 ohms (green/white to blue/yellow)
Stator Coil Resistance	Less than 1 ohm (yellow to yellow)

Peak Voltage (trigger)	7.8-9.3 volts (green/white to blue/yellow)
AC Generator (no load) Output	60 AC volts @ 3000 RPM (black to black)

Specifications are subject to change without notice.

Engine Removal

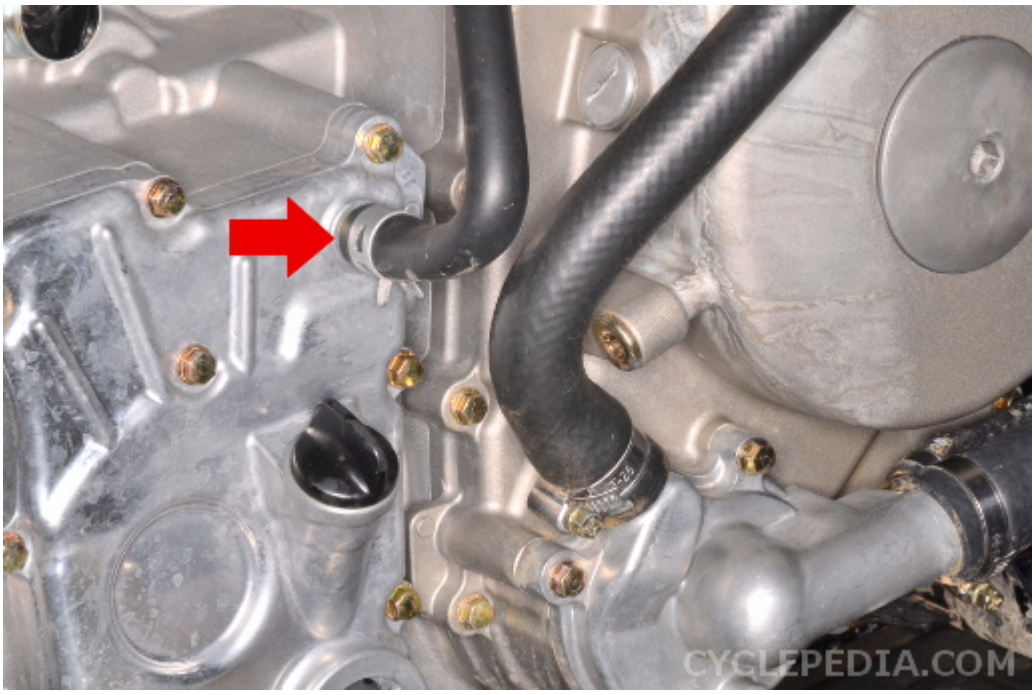
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Remove these components	
Component	Topic
Seat	Seat
Battery	Battery
Front cover	Front Cover
Side Covers	Side Covers
Fuel tank and shield	Fuel Tank
Rack	Racks
Front fender	Front Fender
Mudguards	Mudguards and Footrests
Rear fender	Rear Fender
Airbox and ducts	Airbox
Exhaust system	Exhaust System
Throttle body	Throttle Body Removal and Installation
Brake Pedal	Brake Pedal and Master Cylinder
Drain the engine oil	Engine Oil
Drain the coolant	Coolant
Remove the CVT cooling ducts	CVT Cooling Ducts
Drive selector	Drive Mode Selector

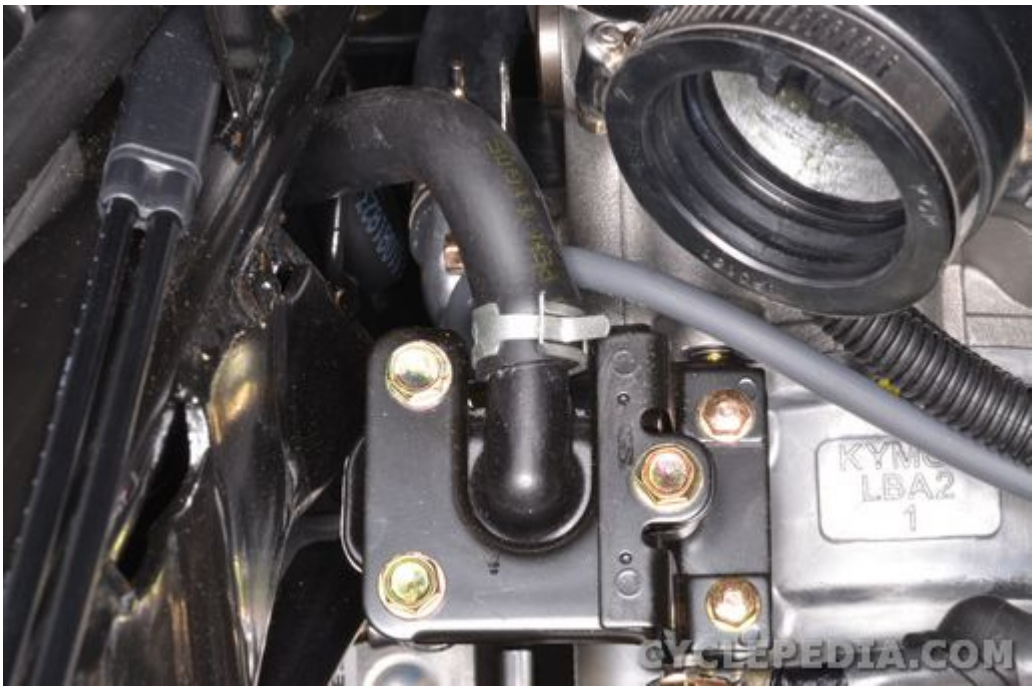
Support the vehicle on a level surface so that it cannot move as you remove the engine.

Pull the spark plug cap off of the spark plug.

Disconnect the crankcase breather hose from the cylinder head cover on the MXU 500i models.

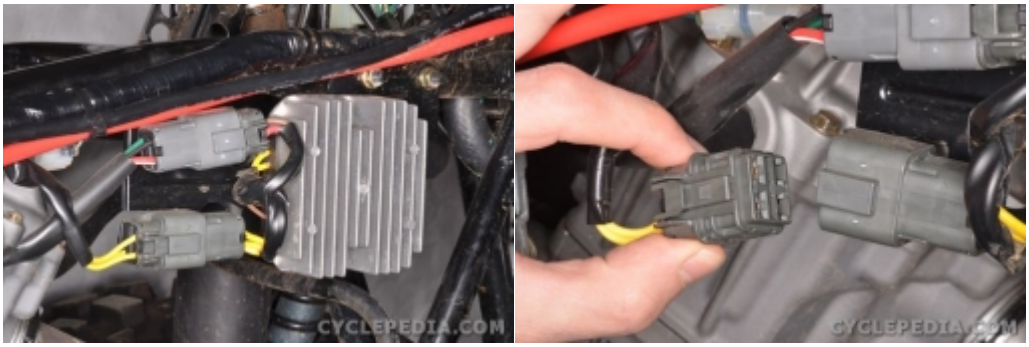


Free the breather hose from the bevel gear cover on the MXU 700i models.

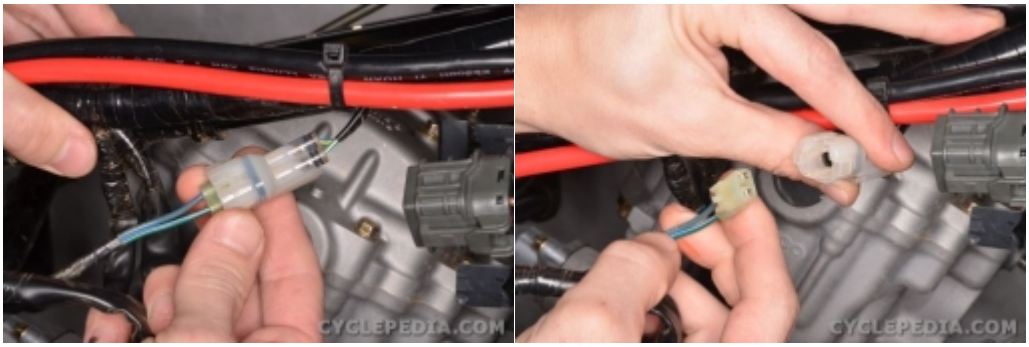


Disconnect the air inlet hose from the PAIR valve on vehicles equipped with an air injection emissions system.

Push in the spring and unplug the WTS sensor connector.

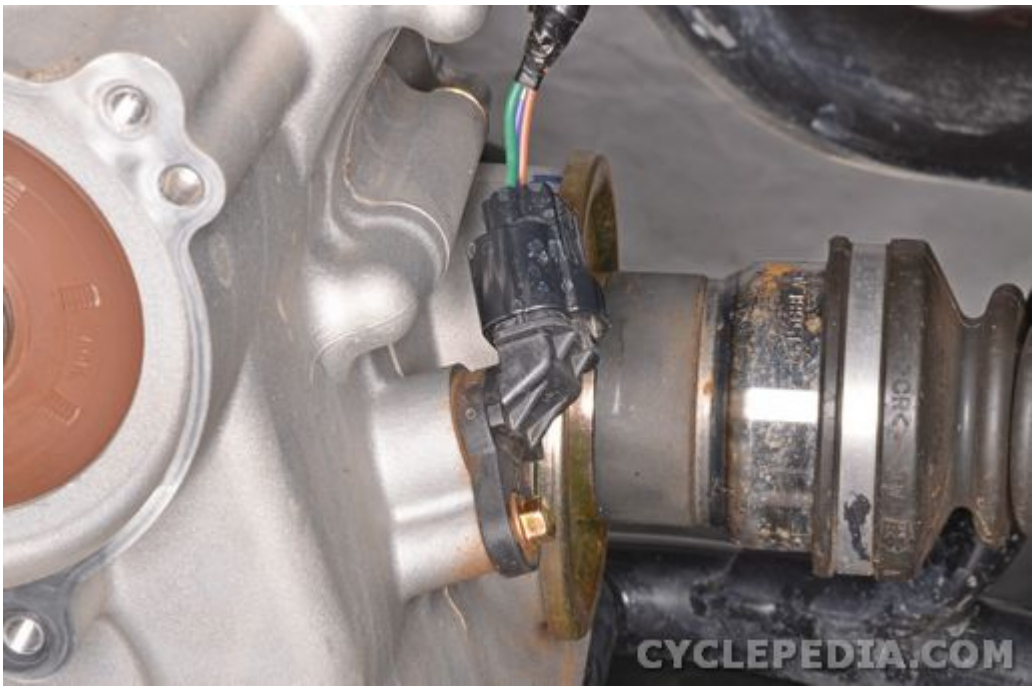


Trace the wires up from the generator cover. Unplug the 4-pin stator connector.



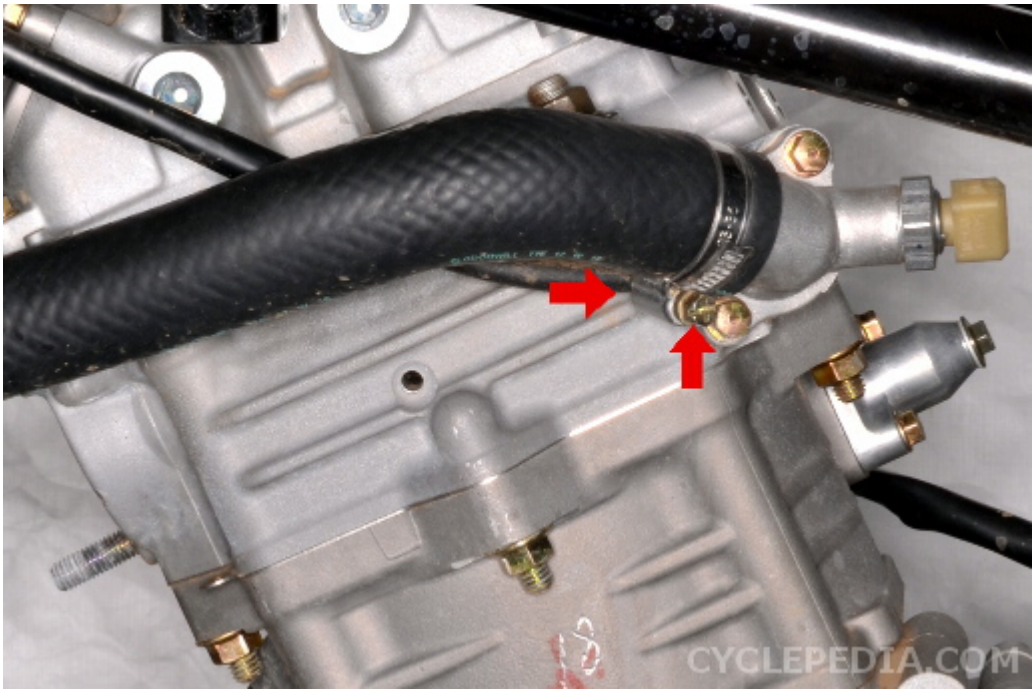
Unplug the 2-pin ignition pulse generator / crank position sensor connector.

Trace the wires up from the gear position switch. Unplug the gear position switch connector.

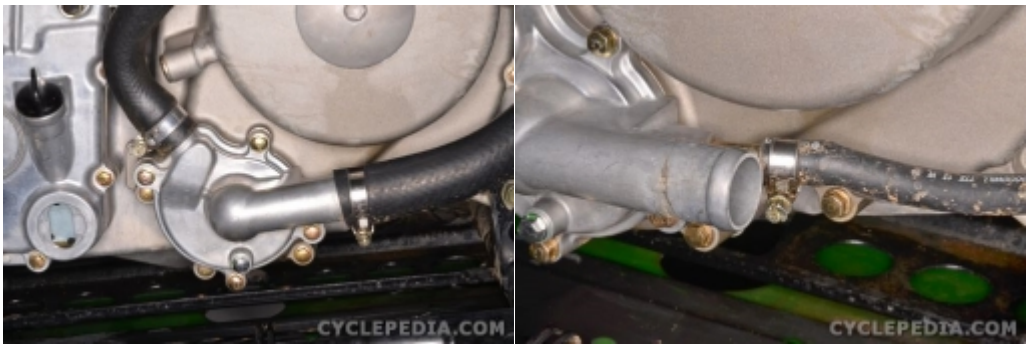


Unplug the connector from the speed sensor.

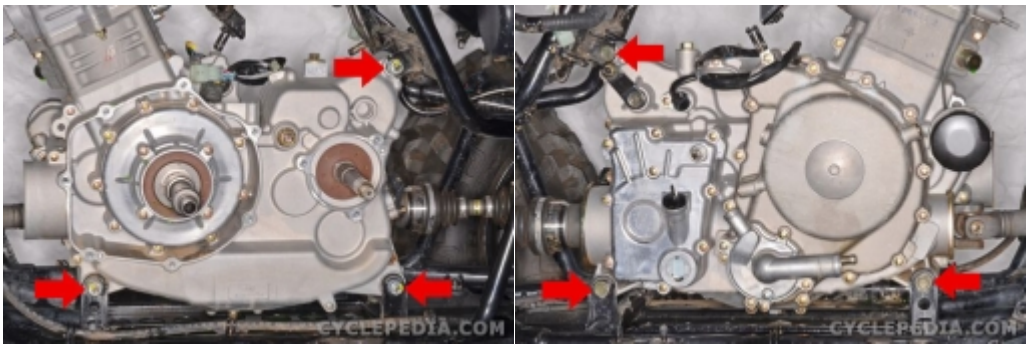
Pull back the rubber cover from the starter motor terminal. Loosen the starter motor terminal nut with a 10 mm socket and free the lead from the terminal. Remove the starter motor mounting bolt with the ground wire with an 8 mm socket. Free the ground wire from the engine.



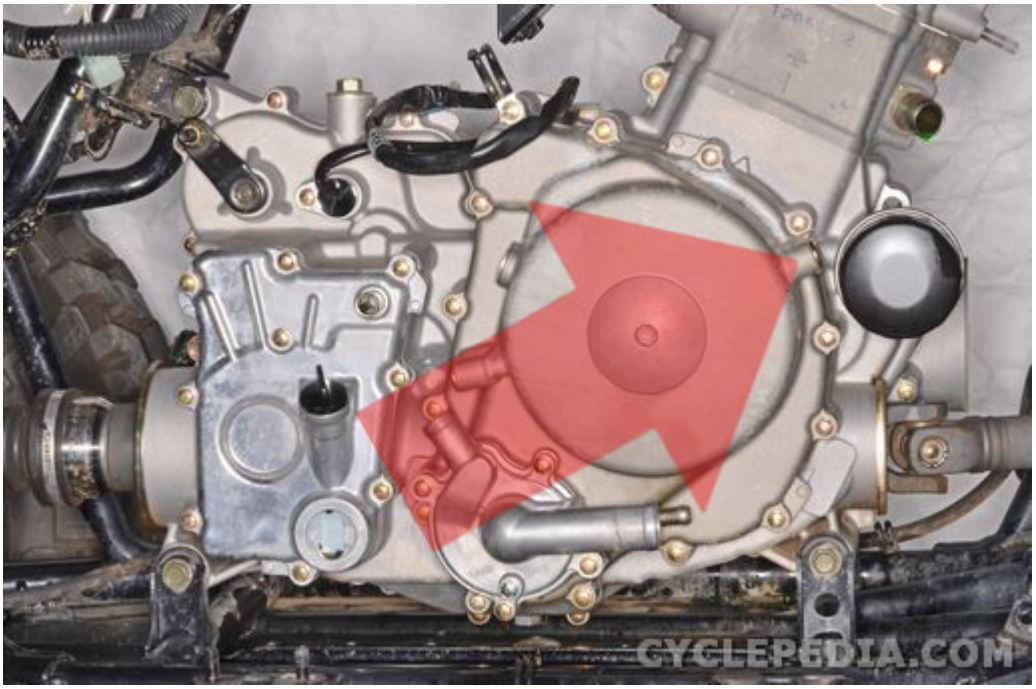
Squeeze the clamp on the air bleed hose and slide it back. Loosen the coolant hose clamp with a #2 Phillips screwdriver. Free the hoses from the WTS housing.



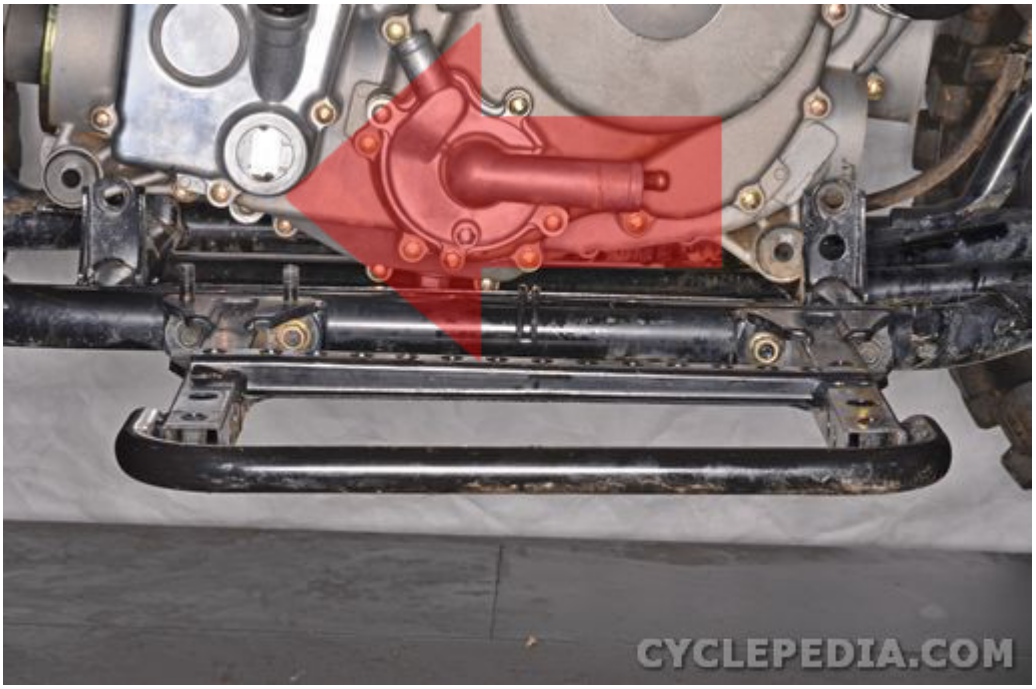
Loosen the bypass (smaller) and lower radiator hose (larger) clamp with a #2 Phillips screwdriver. Free the hoses from the water pump.



There are three engine mounts. Hold the bolts and loosen the nuts. Remove the engine mounting bolts and nuts.



Lift the front of the engine and move it forward to disconnect the rear propeller shaft. Remove the rear propeller shaft.



Slide the engine back.

Disconnect the front propeller shaft.

Note: Do note lose the propeller shaft springs.

Lift the rear of the engine and tilt the engine forward to lower the cylinder head. Guide the engine out of the left side of the frame.

To install the engine. See the Engine Installation topic for more information.

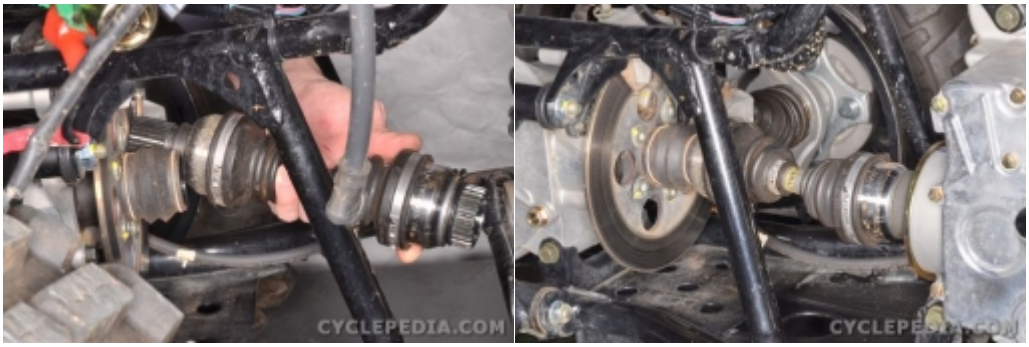
Engine Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

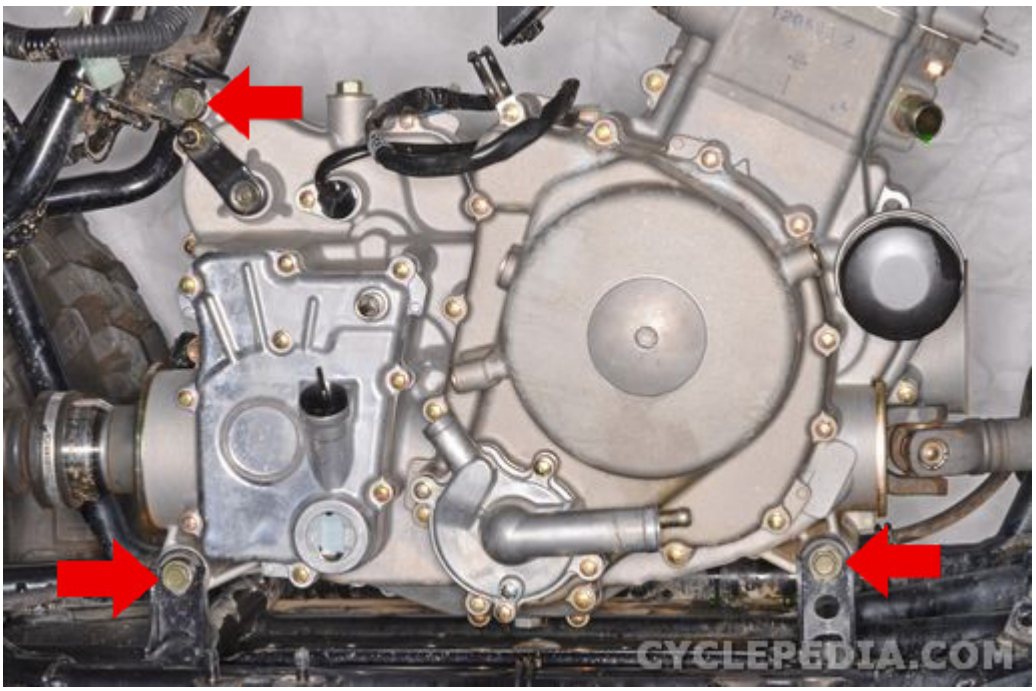
Lubricate the splines of the propeller shafts and final gear pinion shafts with a lightweight lithium-soap based grease. The propeller shaft springs fit between propeller shafts and the final drive pinion shafts.

Tilt the engine to lower the cylinder head and guide the engine into the frame. Bring the engine in from the left side of the frame.

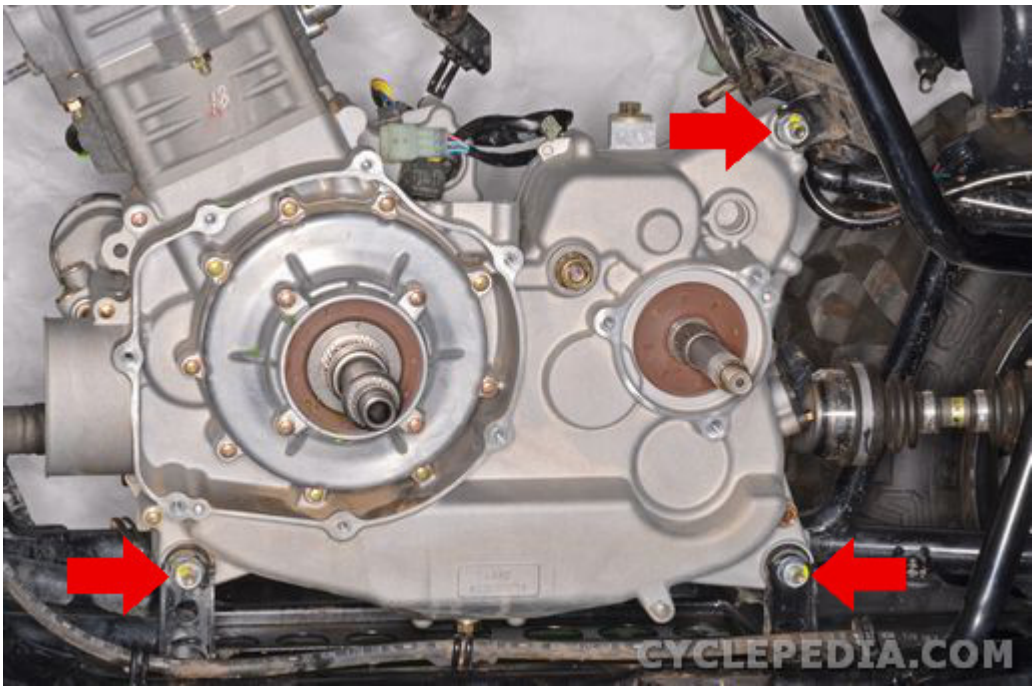
Install the front propeller shaft and slide the engine forward.



Install the rear propeller shaft.

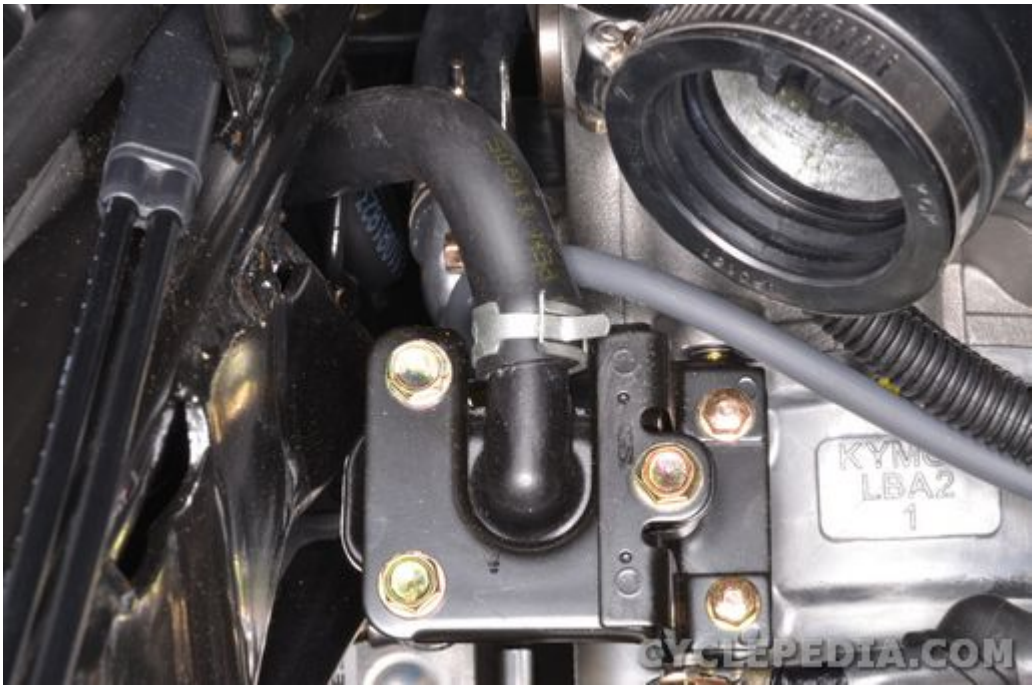


Adjust the engine so that the engine mounts line up correctly. Insert the engine mounting bolts from the right side and thread on the nuts.

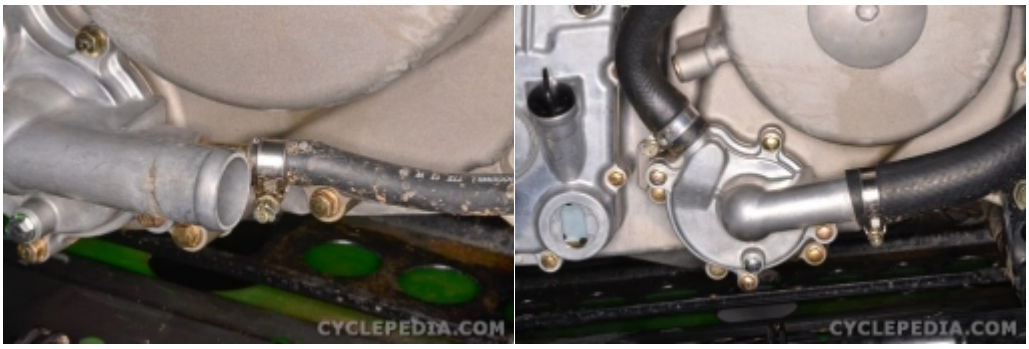


Hold the engine mounting bolts and torque the nuts to specification.

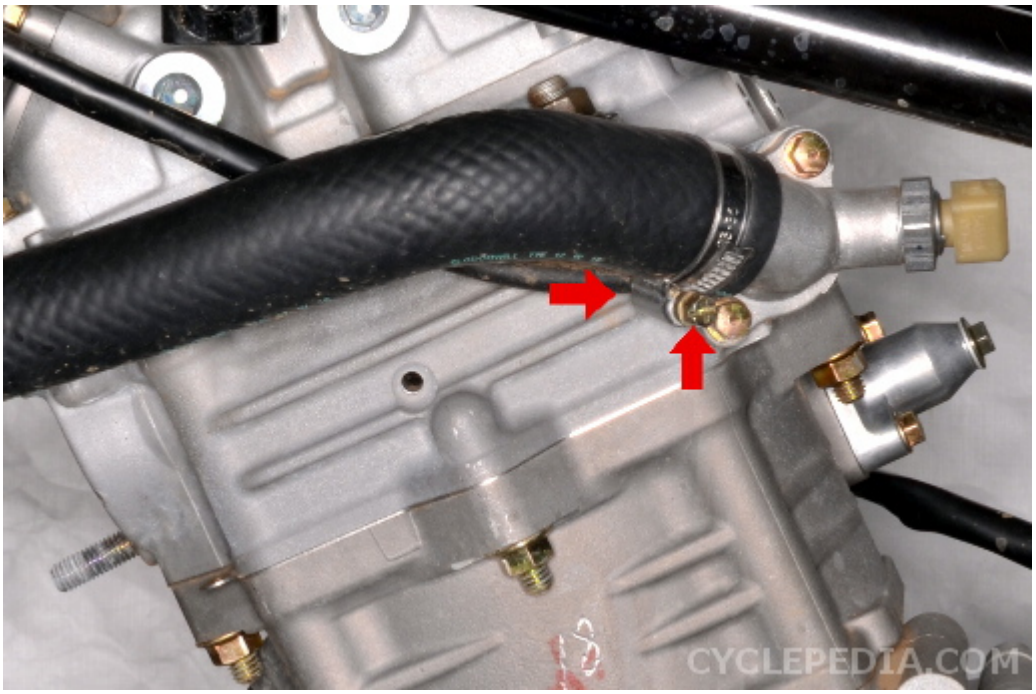
Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Upper engine nut	10	6.0 (60, 43)
Front and rear lower engine nut	10	6.0 (60, 43)



Connect the air inlet hose to the PAIR valve on vehicles equipped with an air injection emissions system.



Connect the coolant hoses to the water pump as shown. Tighten the coolant hose clamps securely with a #2 Phillips screwdriver.

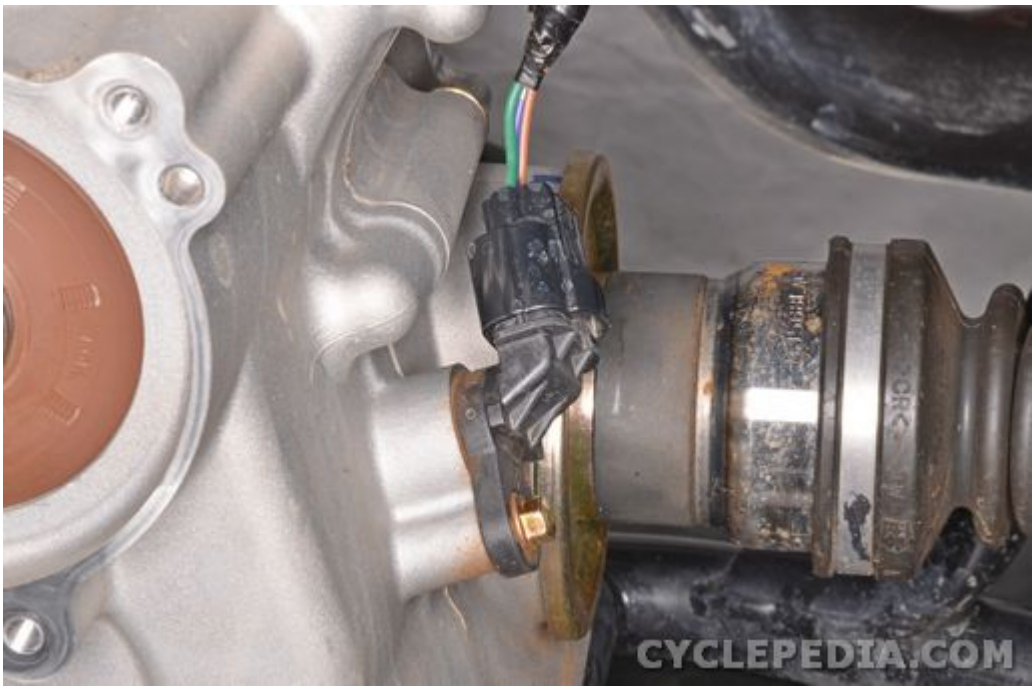


Connect the air bleed hose and thermostat hose to the WTS housing. Secure the hoses with the clamps.

Plug in the WTS sensor connector.

Install the ground lead with the starter motor mounting bolt. Tighten the starter motor mounting bolts to specification with an 8 mm socket. Connect the lead to the starter motor. Tighten the nut securely with a 10 mm socket. Move the rubber cover into place over the terminal.

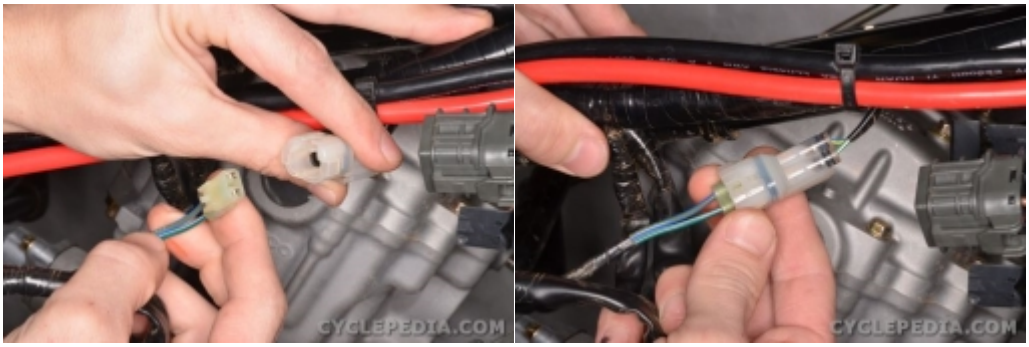
ITEM	THREAD SIZE AND TYPE	TORQUE		
		Nm	kgf-m	ft-lb
STARTER MOTOR BOLT		10.8 ± 1	1.1 ± 0.1	8



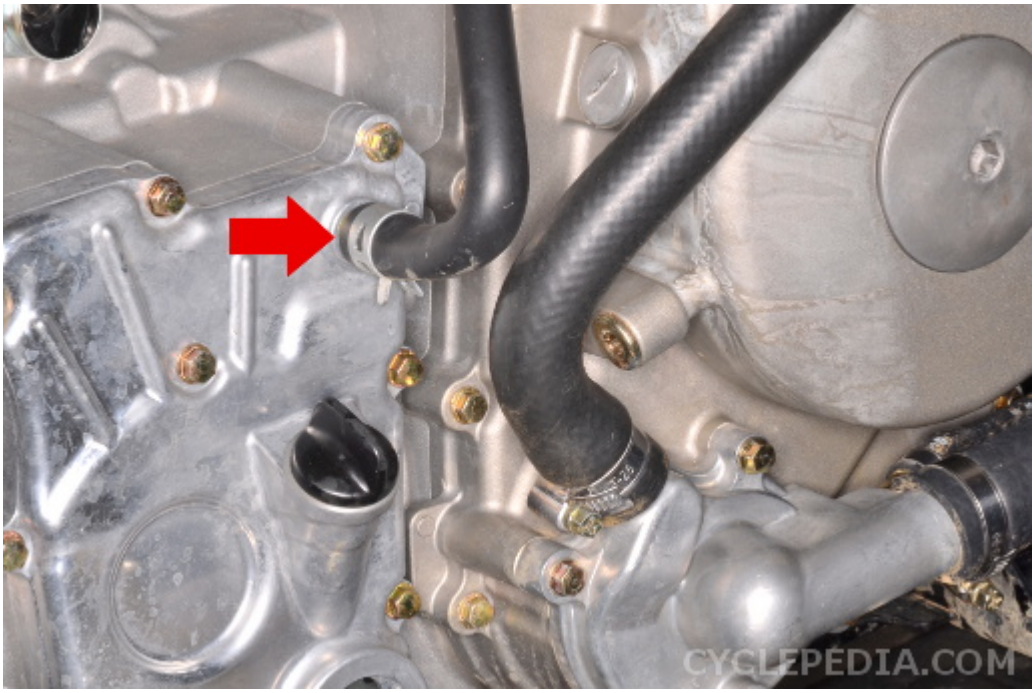
Plug in the speedometer sensor connector.

Plug in the gear position switch connector.

Plug in the 4-pin stator connector.



Plug in the 2-pin ignition pulse generator / crank position sensor connector.



Connect the breather hose to the bevel gear cover on the MXU 700i models. Secure the hose with the clamp.

Connect the crankcase breather hose to the cylinder head cover on the MXU 500i models. Secure the hose with the clamp.

Install the spark plug cap onto the spark plug.

Install these components	
Component	Topic
Drive selector	Drive Mode Selector
CVT cooling ducts	CVT Cooling Ducts
Brake Pedal	Brake Pedal and Master Cylinder
Exhaust system	Exhaust System
Throttle body	Throttle Body Removal and Installation
Airbox	Airbox
Rear fender	Rear Fender

Fuel tank and shield	Fuel Tank
Fill the engine oil	Engine Oil
Fill the coolant	Coolant
Mudguards	Mudguards and Footrests
Side covers	Side Covers
Front cover	Front Cover
Racks	Racks
Battery	Battery
Seat	Seat

Rocker Cover

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Right mudguard	Mudguards and Footrests
Spark plug	Spark Plug

Loosen the timing inspection plug with a large flat blade screwdriver. Remove the timing inspection plug and inspect its O-ring.

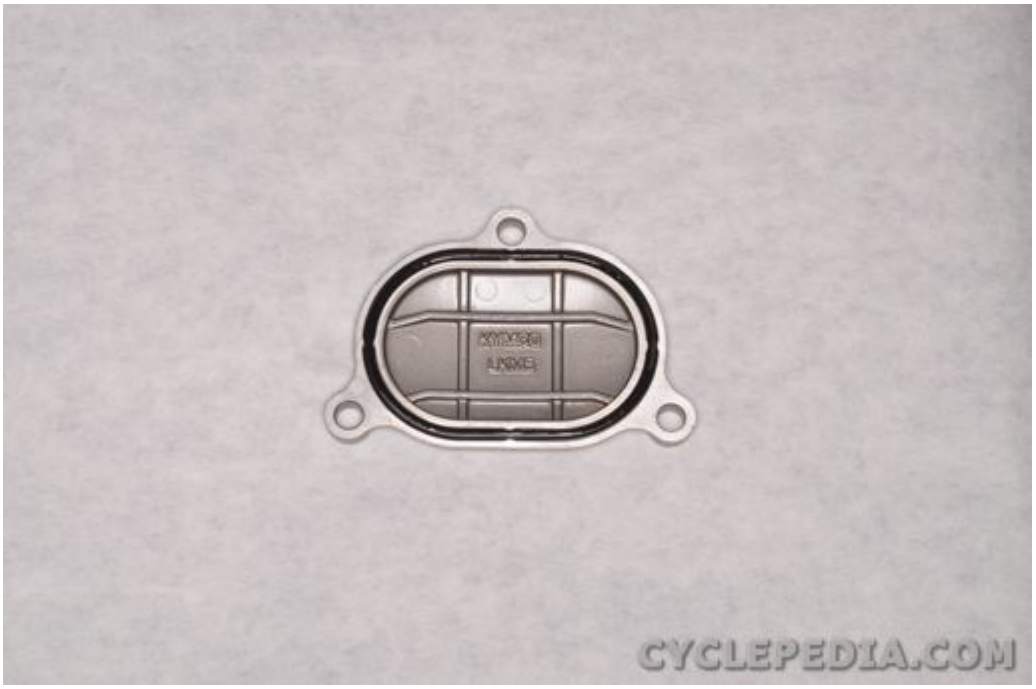
Remove the crankshaft cap on the left side of the engine with a 10 mm Allen socket.

Inspect the O-ring and replace it as needed.

The valve adjuster covers are each held on with three bolts.

Remove the valve adjuster cover bolts with an 8 mm socket.

Lift off the valve adjuster covers.

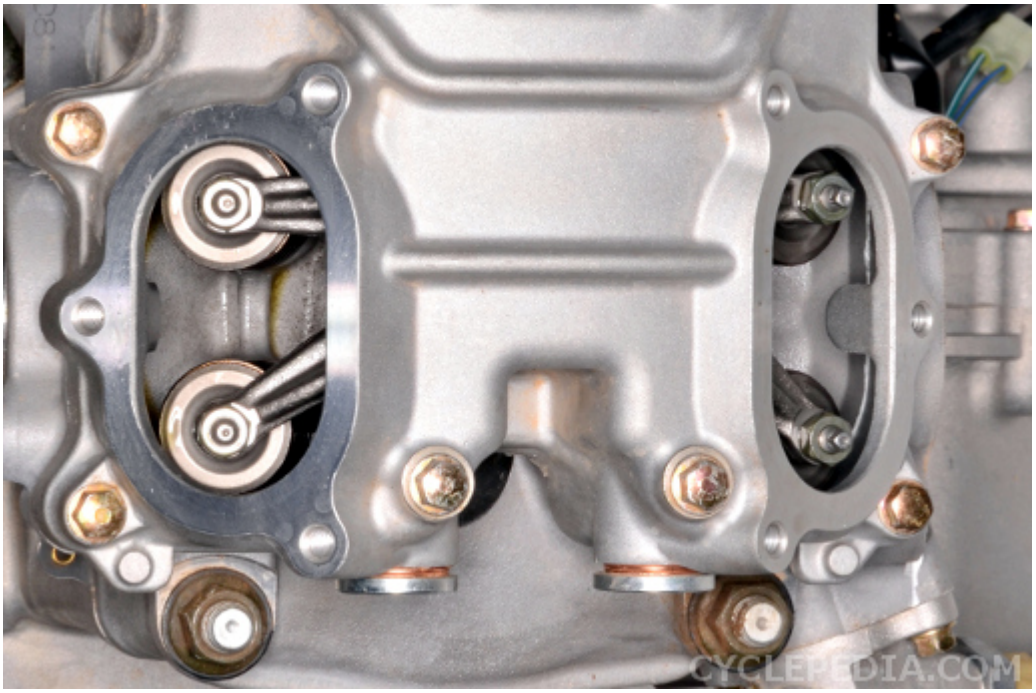


Inspect the valve adjuster cover O-rings and replace them as needed.

The piston should be at TDC (Top Dead Center) on the compression stroke to check the valve clearance. Turn the crankshaft clockwise with a 19 mm socket. Observe the movement of the intake valves and check the position of the flywheel through the timing hole.

The intake valves should open and close.

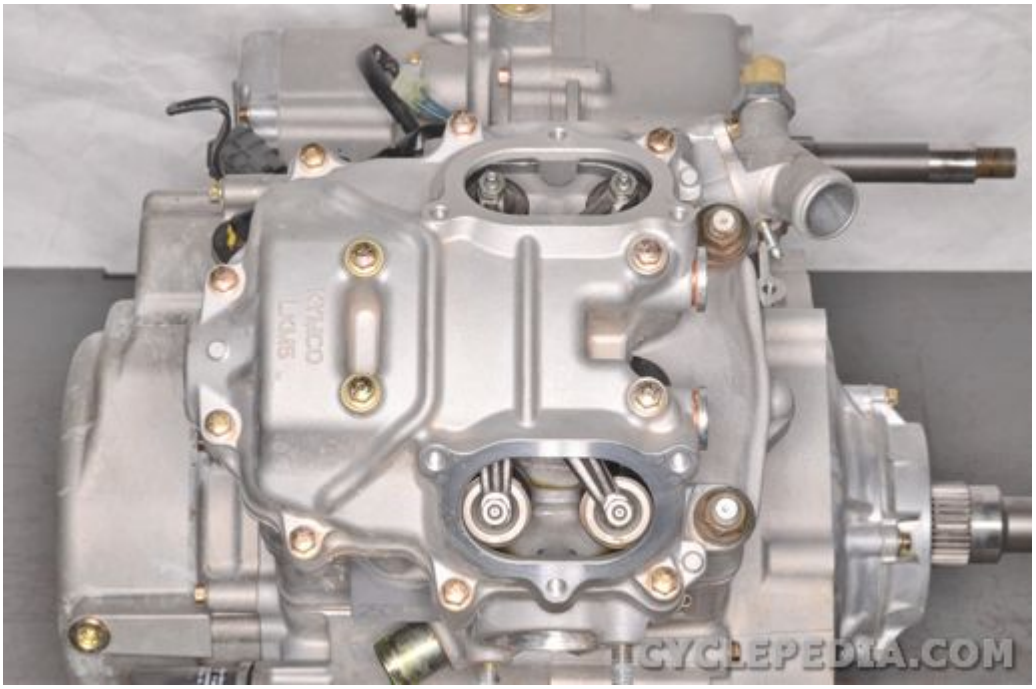
Align the "T" mark on the flywheel with the index mark on the crankcase cover. This shows the piston is at Top Dead Center (TDC).



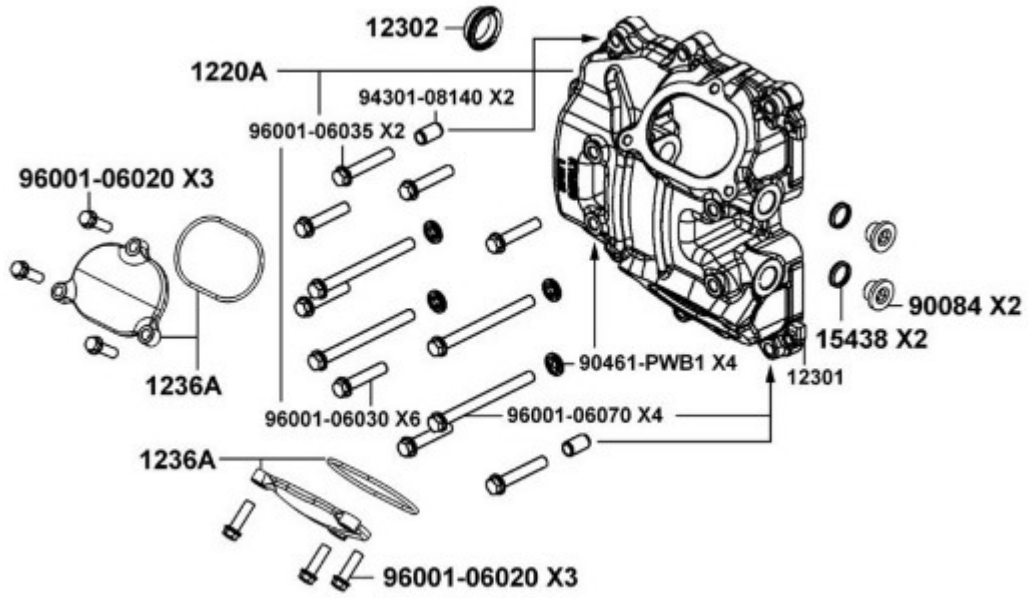
The piston should now be at TDC (Top Dead Center) on the compression stroke. You can make sure that it is on the compression stroke by checking that there is some slack in the rocker arms. If the rocker arms are rigid, rotate the crankshaft 360° until the "T" mark is once again aligned with the notch on

the case cover. There should now be slack in the rocker arms and the piston should be at TDC on the compression stroke.

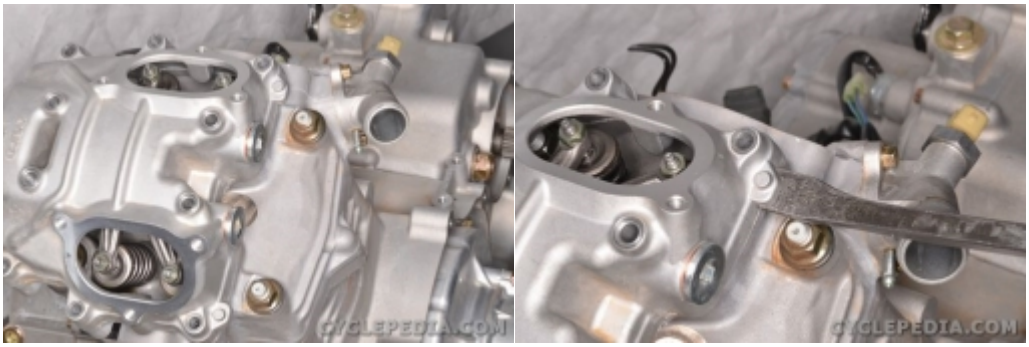
If the rocker arms are to be removed go ahead and loosen the rocker arm shaft bolts with an Allen wrench while the rocker cover is still in place.



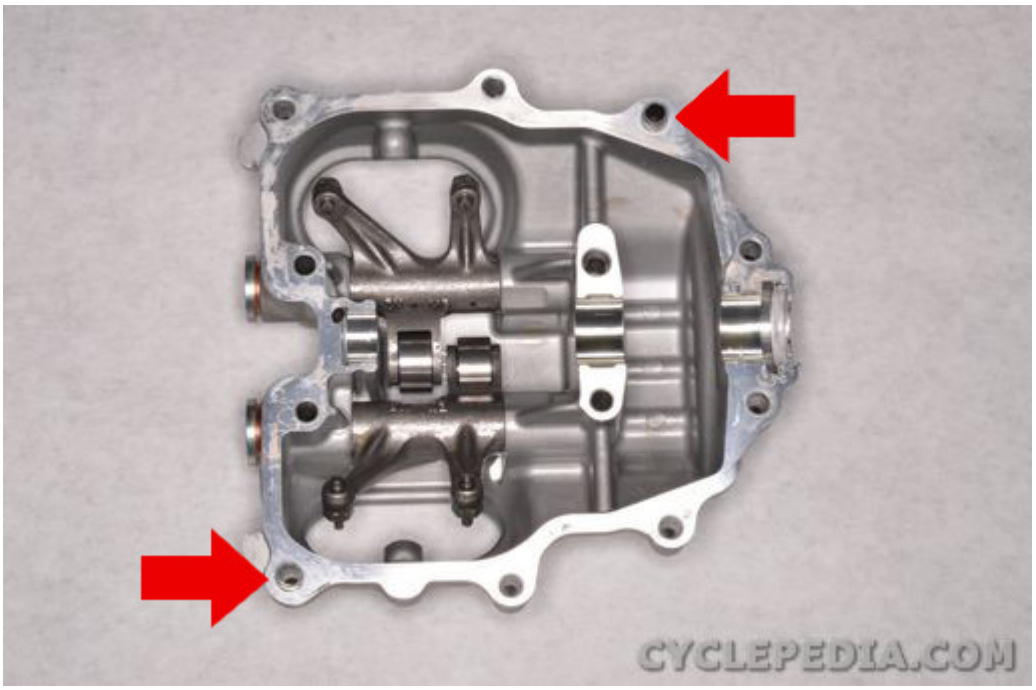
Loosen the rocker cover bolts evenly and in a crisscross pattern with an 8 mm socket.



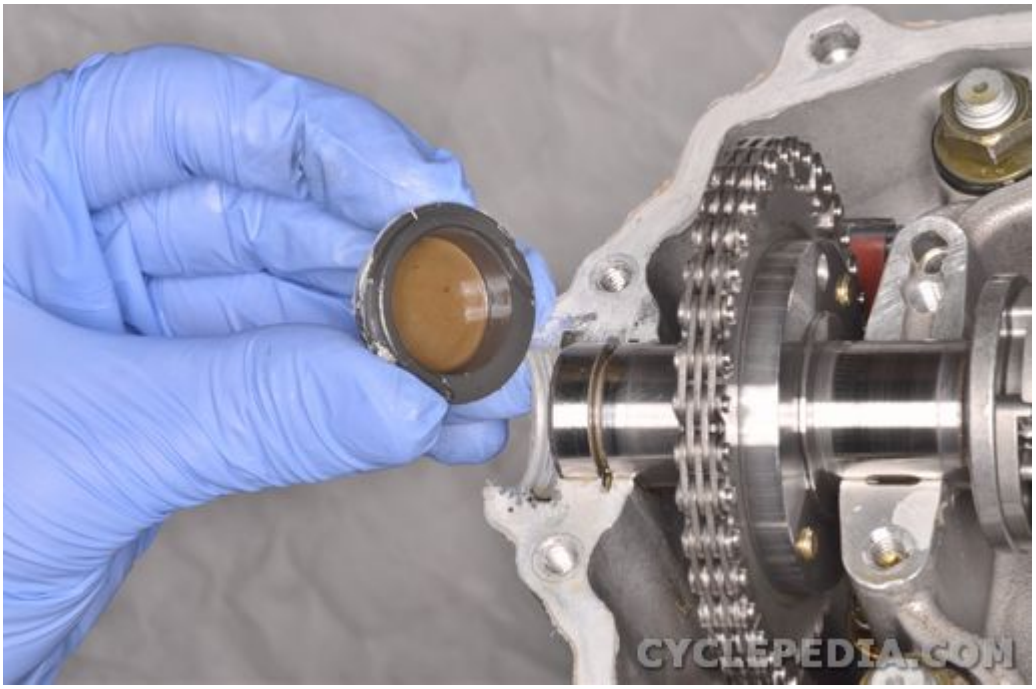
Note the bolt sizes, locations and washers.



Lift off the rocker cover. Utilize the pry points if needed to free the rocker cover from the cylinder head.



Remove the dowel pins.

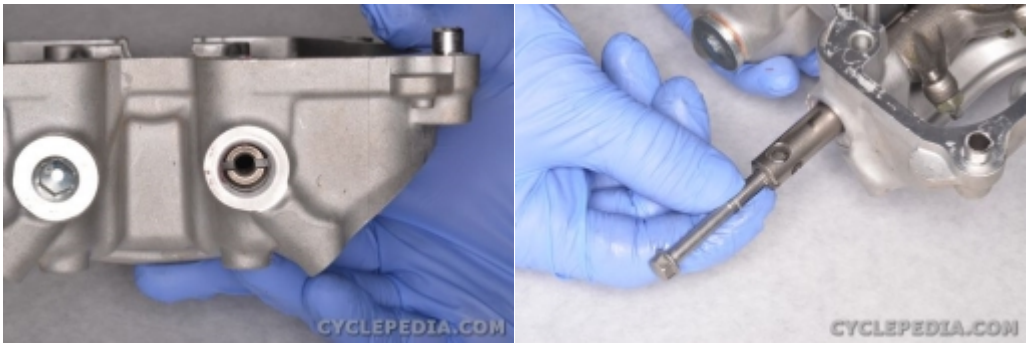


Remove the camshaft end cap.

Rocker Arms and Shafts

Keep the rocker arm components organized so that they can be returned to their original positions.

Loosen the rocker arm shaft bolts with an Allen. Remove the rocker arm shaft bolts and sealing washers.



Thread a bolt (8 mm thread diameter) into the rocker arm shaft and slide out the shaft with the bolt.

Note: Do not mix up the intake and exhaust rocker arms and shafts. Mark the ends if needed to keep track.

Lift out the rocker arm as the shaft is removed.

Inspection

Inspect the rocker arms for wear and damage. Check the cam roller for signs of damage and excessive wear. The roller should not have excessive play on the arm.

Measure the inside diameter of the rocker arm.

Item		Standard mm (in)
Valve rocker arm I.D.	IN	12 - 12.018 (0.4724 - 0.4731)
	EX	12 - 12.018 (0.4724 - 0.4731)

Inspect the rocker arm shafts for wear and damage. Measure the outside diameter of the rocker arm in several locations with a micrometer. Calculate the rocker arm to shaft clearance and replace the parts as needed.

Item		Standard mm (in)	Service Limit
Valve rocker arm shaft O.D.	IN	11.975 - 11.987 (0.471 - 0.4719)	
	EX	11.975 - 11.987 (0.471 - 0.4719)	
Rocker arm to shaft clearance		0.009 - 0.042 (0.0004 - 0.0017)	0.1 (0.004)

Place the rocker cover on a flat surface and check it for warp by inserting a feeler gauge under the mating surface.

Cylinder head cover warpage limit	0.05 mm (0.002 in)

Place the cylinder head cover on the surface plate covered with #400 grit wet-or-dry sandpaper. Using light pressure, move the valve cover in a figure eight motion. Inspect the mating surface for any indication of high spots A high spot can be noted by a bright metallic finish. Correct any high spots before assembly by continuing to move the cylinder head cover in a figure eight motion until a uniform bright metallic finish is attained.

Caution: Do not remove an excessive amount of material from the cylinder head cover or damage to the camshaft will result. Always check camshaft clearance when resurfacing the valve cover.

Caution: Water or parts-cleaning solvent must be used In conjunction with the wet-or-dry sandpaper or damage to the sealing surface may result.

Assembly

Rocker Arms and Shafts

Lubricate the rocker arms and shafts with fresh engine oil.

Set the rocker arms in place in their original positions.

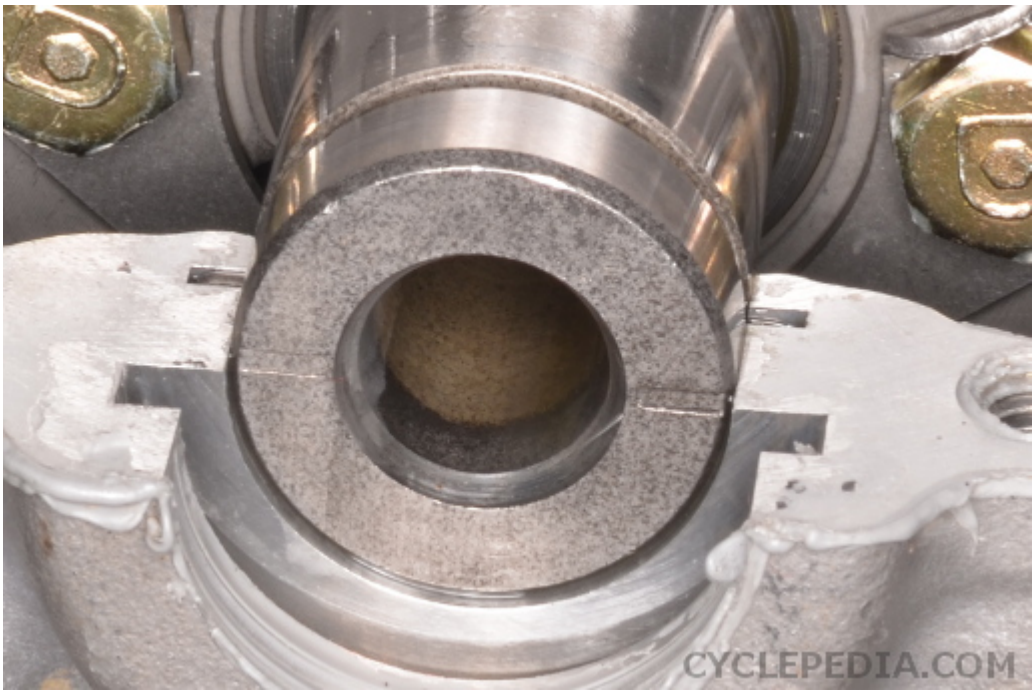
Insert the rocker arm shafts into the rocker cover and through the rocker arms. Make sure the intake and exhaust rocker arm shafts are returned to their correct positions. Use a flat blade screwdriver to rotate the rocker arm shafts so that the holes in the shafts lines up with the rocker cover bolt holes.

Install the rocker arm shaft bolts with new sealing washers. Tighten the rocker arm shaft bolts to specification with an Allen socket.

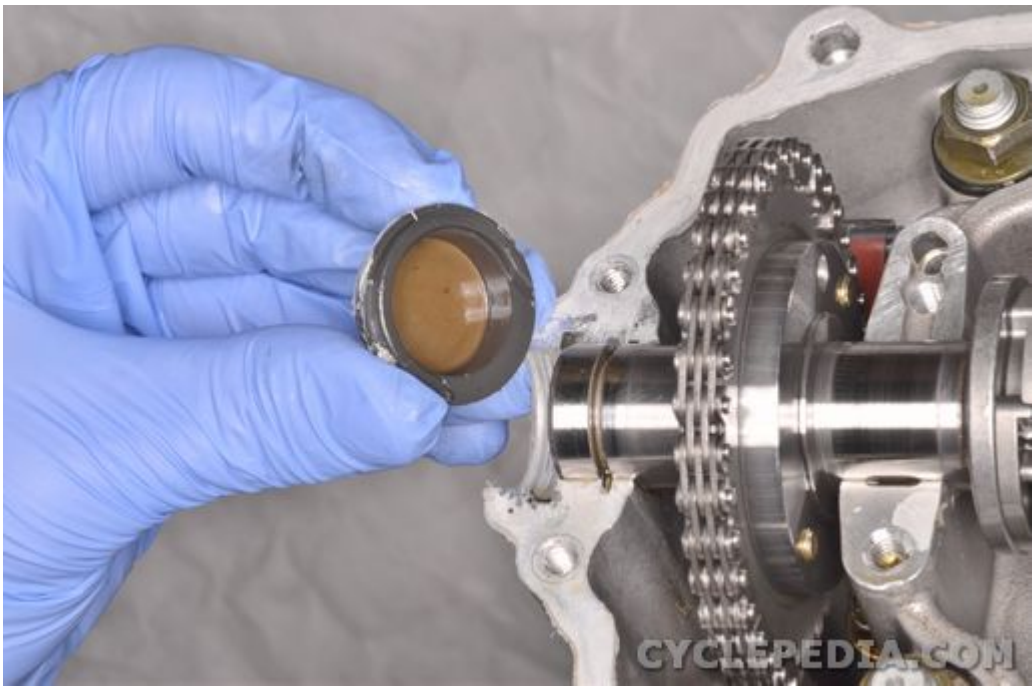
ITEM	THREAD SIZE AND TYPE	TORQUE VALUES	
		N-m	ft-lb
SHAFT ROCKER ARM	SPECIAL SCREW M18 x 1.5	39.2-49	28.9-36.1

Installation

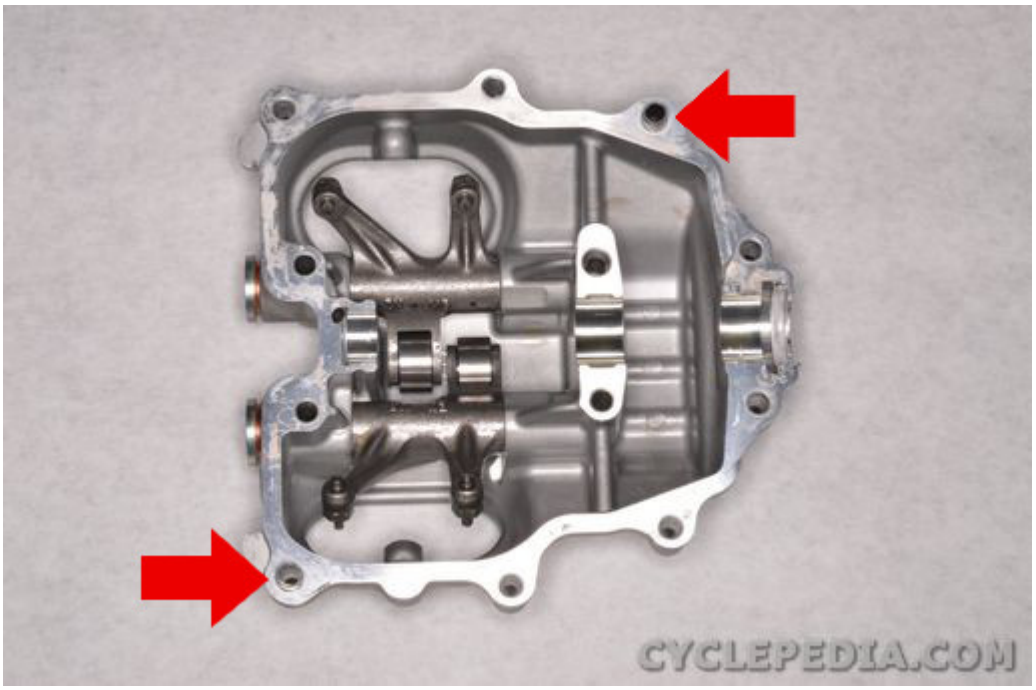
Make sure the rocker cover mating surface is clean and free of old gasket material



Position the piston at TDC as with removal. The camshaft lobes should be pointing down and the marks on the end of the camshaft should be level with the rocker cover mating surface.



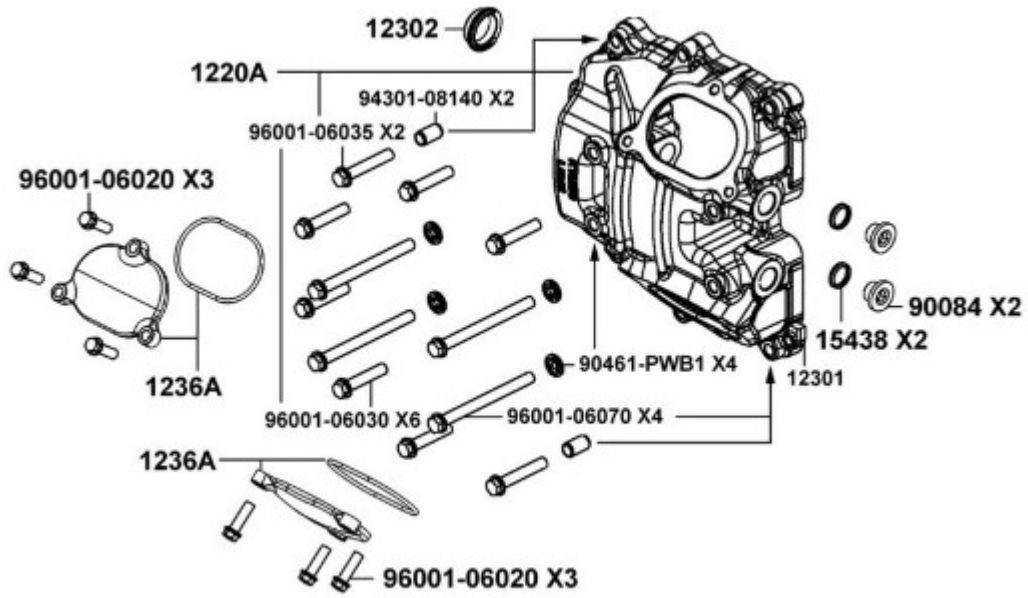
Apply a light coat of fluid gasket (threebond: 1215) to the outside of the camshaft end cap. Install the camshaft end cap.



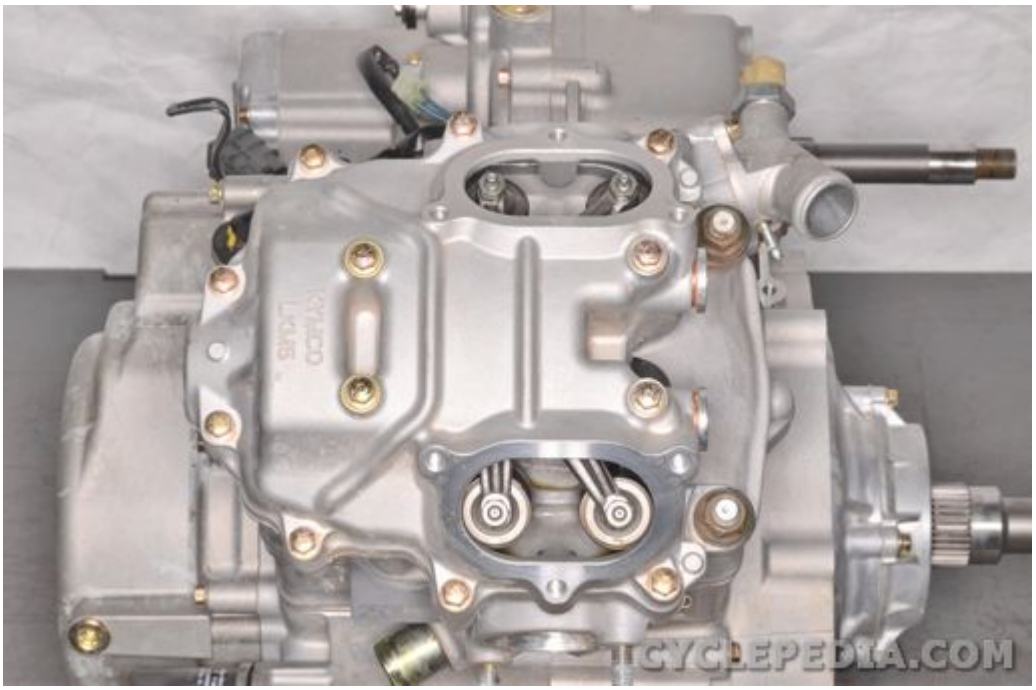
Install the rocker cover dowel pins.

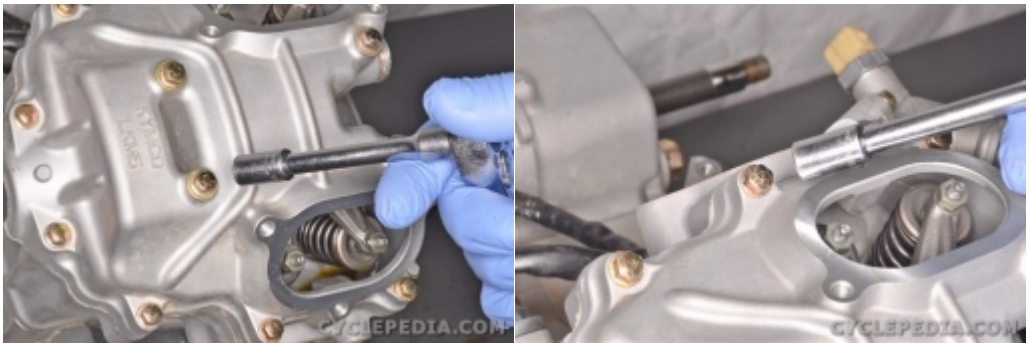
Apply fluid gasket (threebond: 1215) to the mating surface of the rocker cover. Do not allow the sealant to get on the rocker arms, camshaft, camchain, or into any oil passages.

Install the rocker cover. Make sure the cap cam shaft cap is in place.



Install the rocker cover bolts and washers to their original positions.





From the inside out, tighten the rocker cover bolts evenly and in a crisscross pattern. Torque the to specification with an 8 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES	
		N-m	ft-lb
ROCKER COVER	M6 x 1.0	9.8	7.2

Check the valve clearance. See the Valve Adjustment topic for more information.

Make sure the valve adjuster cover O-rings are in good condition. Apply a light coat of fresh engine oil to the O-rings. Fit the valve adjuster covers into place.

Install the valve adjuster cover bolts. Tighten the bolts securely with an 8 mm socket.

Make sure the crankshaft cap O-ring is in good condition. Apply fresh engine oil to the O-ring.

Install the crankshaft cap.

Tighten the crankshaft cap securely with a 10 mm Allen socket. Do not over tighten this cap.

Make sure the timing plug O-ring is in good condition. Apply fresh engine oil to the O-ring.

Install the timing inspection plug and tighten it securely with a large flat blade screwdriver.

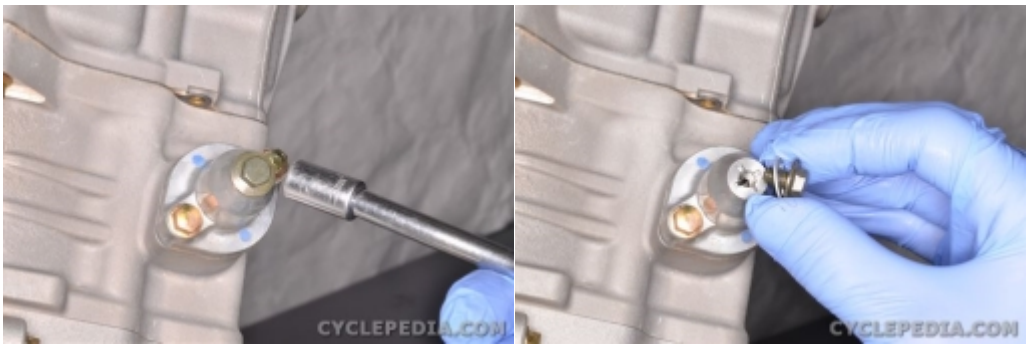
Install these components	
Component	Topic
Spark plug	Spark Plug
Right mudguard	Mudguards and Footrests
Side covers	Side Covers
Fuel tank and shield	Fuel Tank
Seat	Seat

Camshaft

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Right mudguard	Mudguards and Footrests
Spark plug	Spark Plug
Rocker cover	Rocker Cover



Remove the cam chain tensioner sealing bolt with a 10 mm socket.

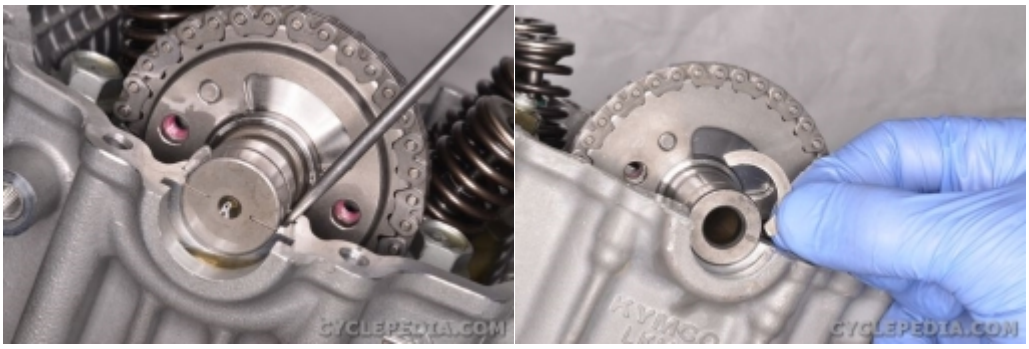
Remove the two cam chain tensioner bolts with an 8 mm socket.

Remove the cam chain tensioner and gasket.

Flatten tabs on the camshaft sprocket retaining washer with a punch and hammer. Make sure the cam chain is taught if the crankshaft needs to be rotated while the cam chain tensioner is removed.

Remove the two camshaft sprocket bolts with a 10 mm socket.

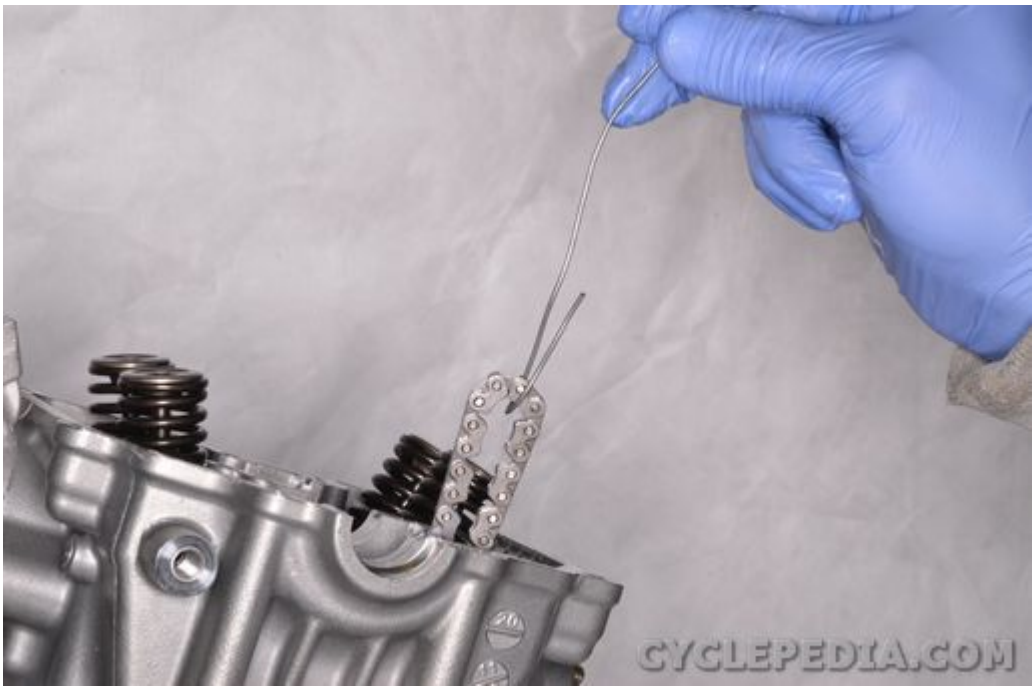
Remove the camshaft sprocket retaining washer.



Push the camshaft C-ring out with an awl. Remove the C-ring. Do not drop the C-ring into the crankcase.

Free the cam chain from the camshaft sprocket. Slide the camshaft sprocket off of the camshaft.

Remove the camshaft and sprocket.



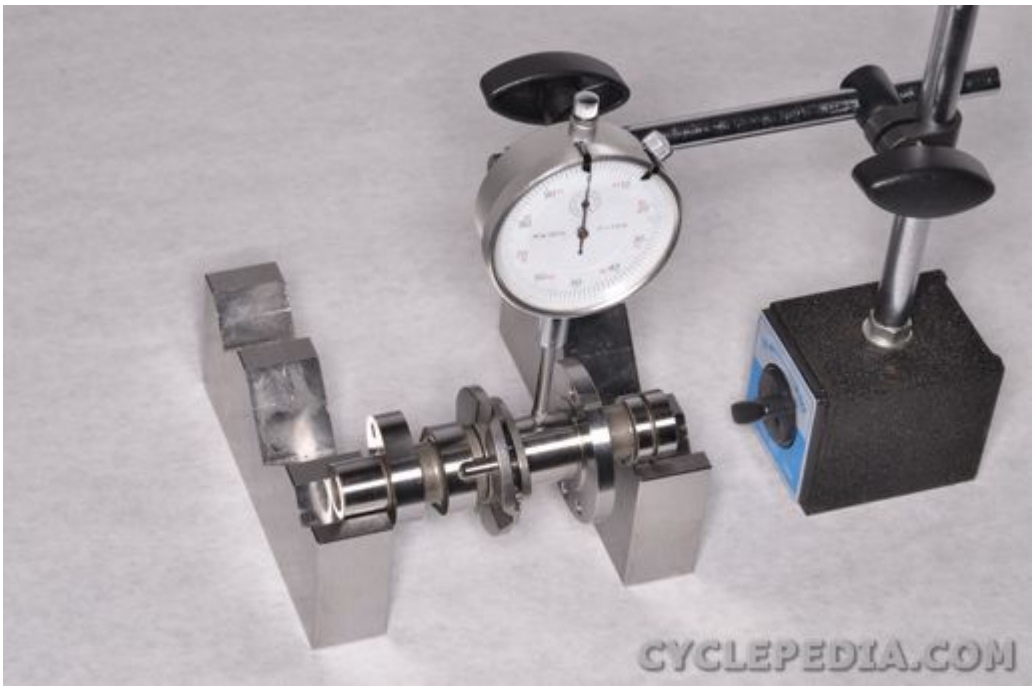
Secure the cam chain with a piece of wire to keep if from falling into the bottom end of the engine.

Inspection

Inspect the camshaft lobes and journals wear and damage. If there are signs of damage or discoloration inspect the lubrication system.

Measure the maximum height of the cam lobes with a micrometer.

Item		Standard mm (in)
Camshaft cam height	IN	37.9809 (1.4953)
	EX	37.3412 (1.4701)

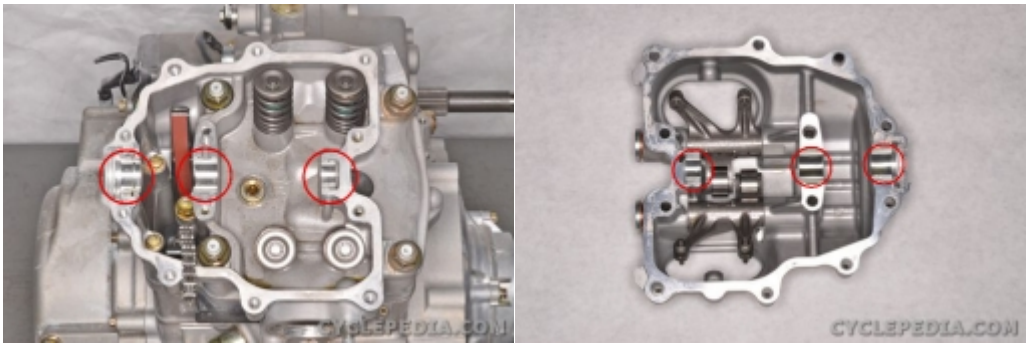


Place the camshaft on V Blocks and measure the runout with a dial gauge. Replace the camshaft if the runout exceeds the maximum.

Item	Standard mm (in)	Service Limit
Camshaft runout	-	0.05 (0.002)

The camshaft is equipped with a decompression system. This serves to slightly open the exhaust valve and lower the engine compression for starting.

Inspect the decompressor on the camshaft. The weight should move smoothly and return to rest when released. When the decompressor weight is at rest the round side of the pin should face out. When the weight is extended the flat side of the pin should face out.



Inspect the camshaft journal holders for scoring, scratches, or other damage. The cylinder head and rocker cover must be replaced as a set if needed.

Check the camshaft sprocket for wear and damage.

Check that the cam chain tensioner is functioning properly. Use a flat blade screwdriver to wind back the rod. Make sure the push rod slides out smoothly

when the locking mechanism is released. If the tensioner sticks or fails to extend replace it.

To install the camshaft see the Camshaft Installation topic.

Camshaft Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

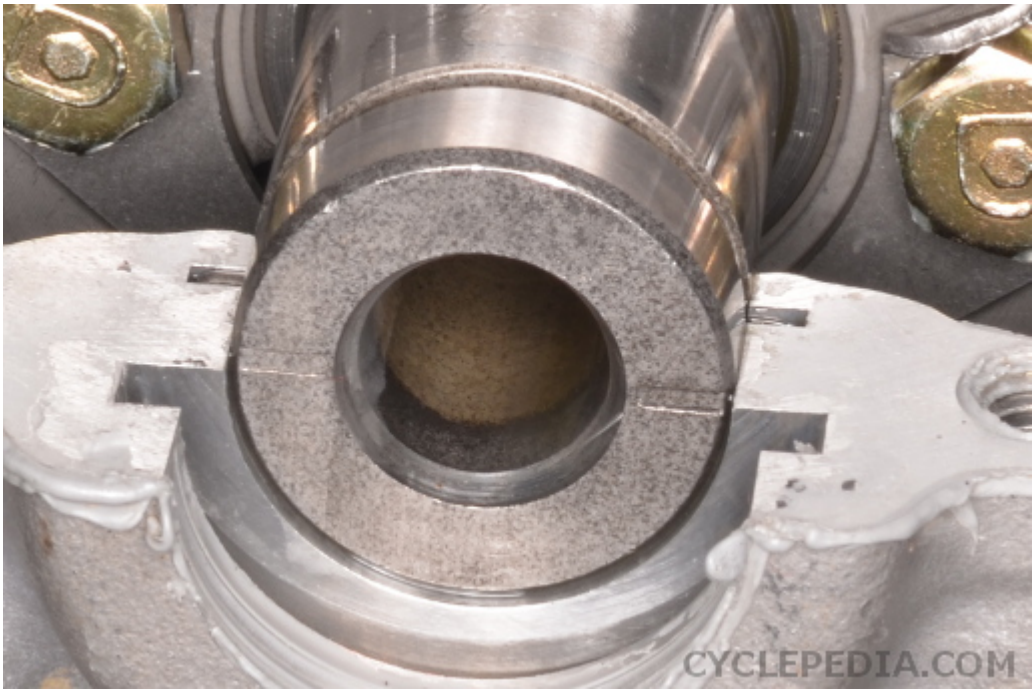
Installation

Align the "T" mark on the flywheel with the index mark on the crankcase cover. This shows the piston is at Top Dead Center (TDC). For more information on setting the piston to TDC see the Rocker Cover topic.

Apply molybdenum oil to the camshaft lobes, the journal holders in the camshaft holders and the cylinder head.

Molybdenum oil: a mixture of molybdenum grease and fresh engine oil in a 50:50 ratio.

Fit the camshaft into place with its lobes facing down. Do not fit the sprocket onto the camshaft until the engine timing is correct.



The marks on the end of the camshaft should be level with the rocker cover mating surface.

Fit the sprocket onto the camshaft. Install the C-ring into the groove in the cylinder head. Make sure the C-ring stays in place if the camshaft rotates. It can fall out if the camshaft is rotated when the rocker cover is off.

Install the new camshaft sprocket retaining washer over the sprocket pin.

Apply a thread locking agent (Red Loctite #271) to the threads of the camshaft sprocket bolts. Tighten the camshaft sprocket bolts to specification with a 10 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES	
		N-m	ft-lb
SPROCKET CAMSHAFT	SPECIAL BOLT M6 x 1.0	10.8-14.7	8-10.8

Bend the tabs of the retaining washer against the camshaft sprocket bolts with a punch and a hammer.

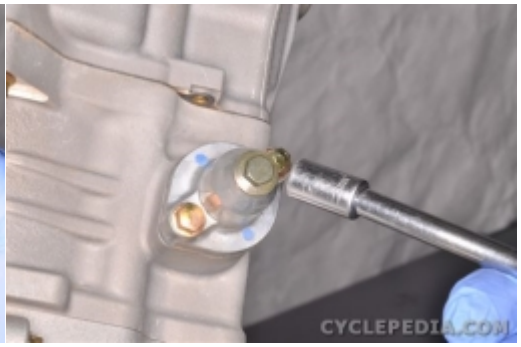
Cam Chain Tensioner

Make sure the cam chain tensioner mating surface is clean. Install a new gasket with the cam chain tensioner.

Use a small flat blade screwdriver to wind in the cam chain tensioner rod. Hold the screwdriver in place until both tensioner mounting bolts have been installed.

Install the two cam chain tensioner mounting bolts and tighten them to specification with an 8 mm socket. Release the screwdriver so the tensioner rod will extend.

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES	
		N-m	ft-lb
TENSIONER LIFTER	SHF M6 x 1.0	9.8-13.7	7.2-10.1



Install the cam chain tensioner sealing bolt with washer and tighten it securely.

Turn the engine over and double check the cam timing. When the "T" mark on the flywheel is aligned in the timing hole the marks on the end of the camshaft should be level with the rocker cover mating surface. Make sure the C-ring stays in place if the camshaft rotates. It can fall out if the camshaft is rotated when the rocker cover is off.

Install these components	
Component	Topic
Cylinder head cover	Rocker Cover
Spark plug	Spark Plug
Right mudguard	Mudguards and Footrests
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Seat	Seat

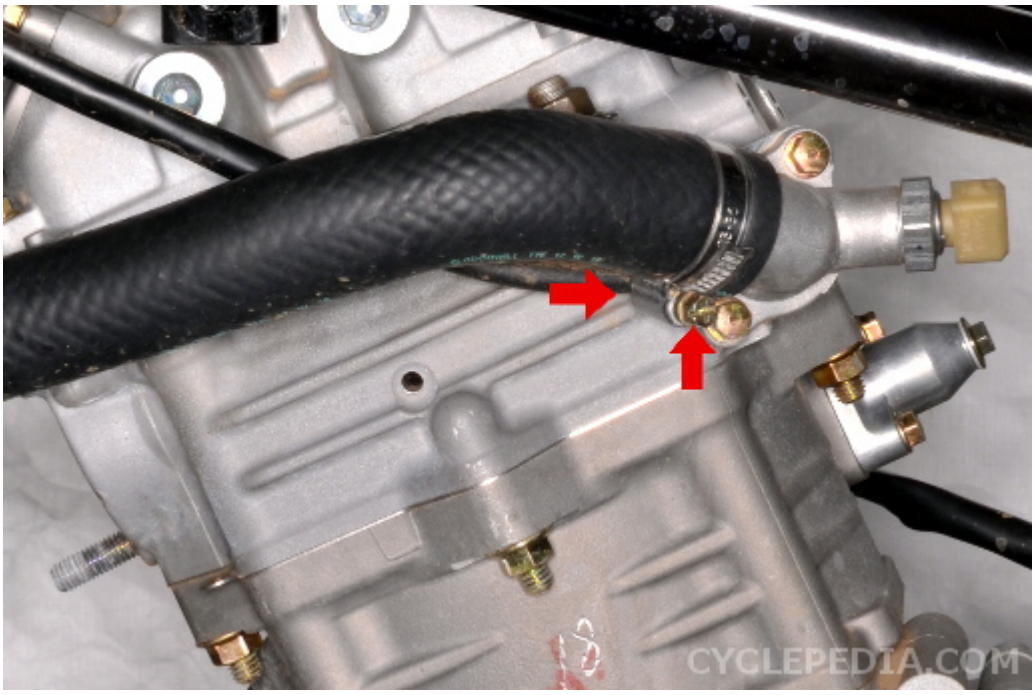
Cylinder Head

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Spark plug	Spark Plug
Drain the coolant	Coolant
Rocker cover	Rocker Cover
Camshaft	Camshaft
Exhaust system	Exhaust System
Throttle body and intake pipe	Throttle Body Removal and Installation

Push in the spring and unplug the WTS sensor connector.

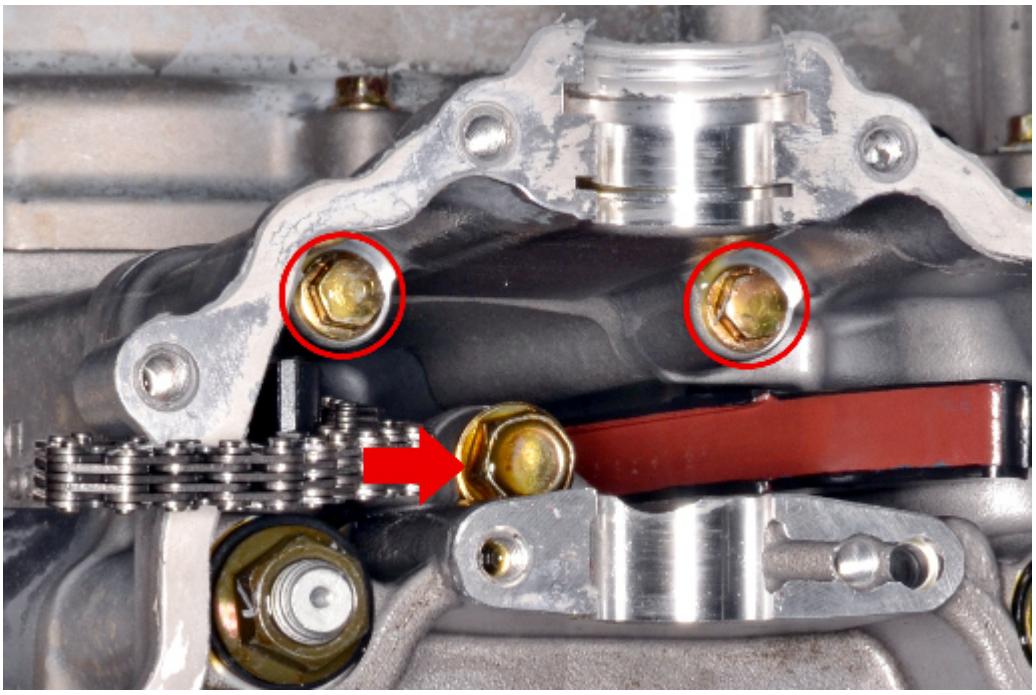


Squeeze the clamp on the air bleed hose and slide it back. Loosen the coolant hose clamp with a #2 Phillips screwdriver. Free the hoses from the WTS housing.

To remove the WTS housing remove the two bolts with an 8 mm socket.

Remove the WTS housing from the cylinder head. Discard the WTS housing gasket.

Remove the three nuts under the cylinder head with a 12 mm wrench.



Loosen the two long cylinder head bolts with an 8 mm socket. Loosen the larger diameter cylinder head bolt with a 12 mm socket.

Remove the three cylinder head bolts.

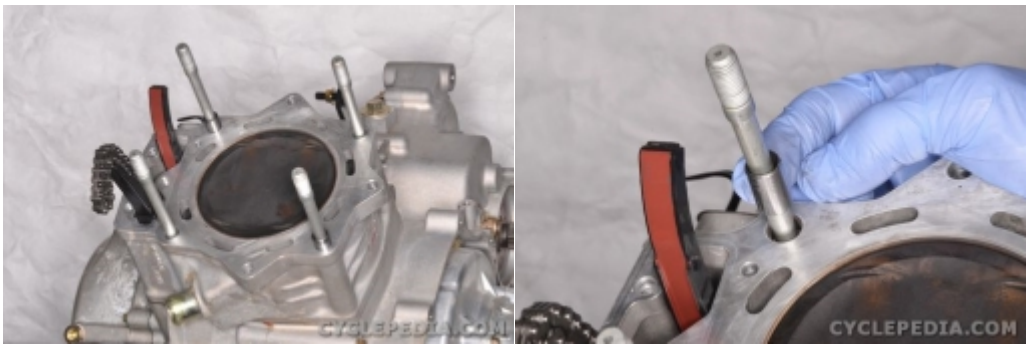
There are four large cylinder head nuts. Loosen the large cylinder head nuts evenly and in a crisscross pattern with a 14 mm socket.

Remove the cylinder head nuts and washers.

Tap the reinforced areas of the cylinder head with a rubber mallet to free the dowel pins.

Lift off the cylinder head. Guide the cam chain through the opening, but do not allow it to fall into the bottom end of the engine.

Remove the cylinder head gasket.



Remove the two cylinder head dowel pins.

Lift out the front cam chain guide. Secure the cam chain so that it doesn't fall into the bottom end of the engine.

To remove the valves see the Valves topic.

Inspection

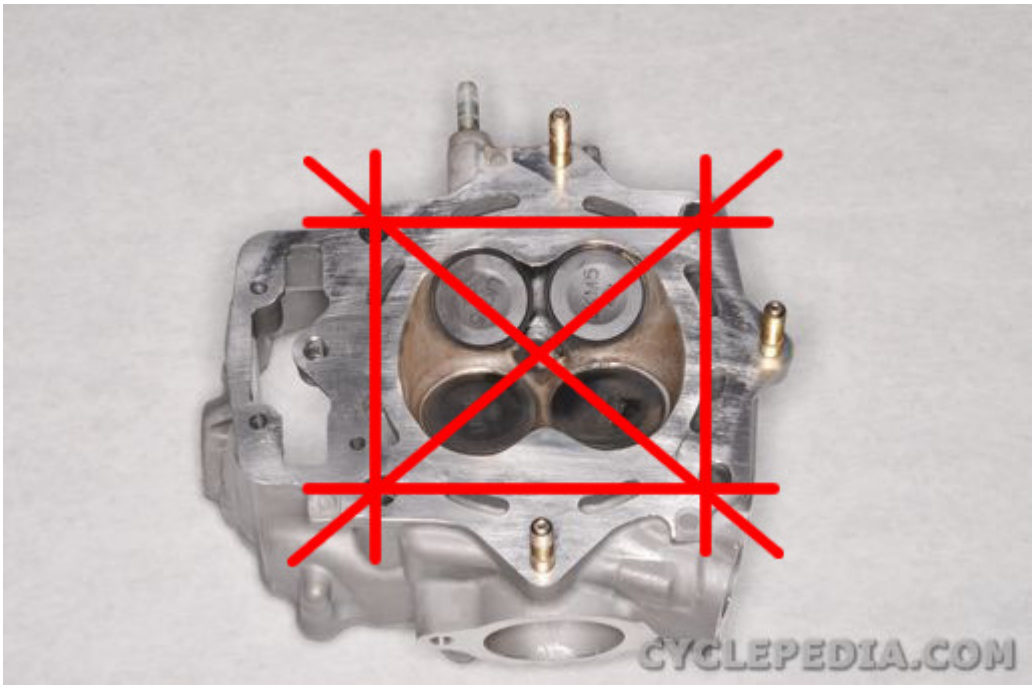
Inspect the cam chain guide for wear an damage. Replace the guide as needed.

Clean the combustion chamber with contact cleaner, a plastic knife, brush and/or rag. Take care to only remove carbon and not scrape the head.

Check the spark plug hole and threads for damage. Repair the threads with a "heli-coil" insert if needed.

Place a straight edge on the deck of the cylinder head and check for cylinder head warp with a feeler gauge.

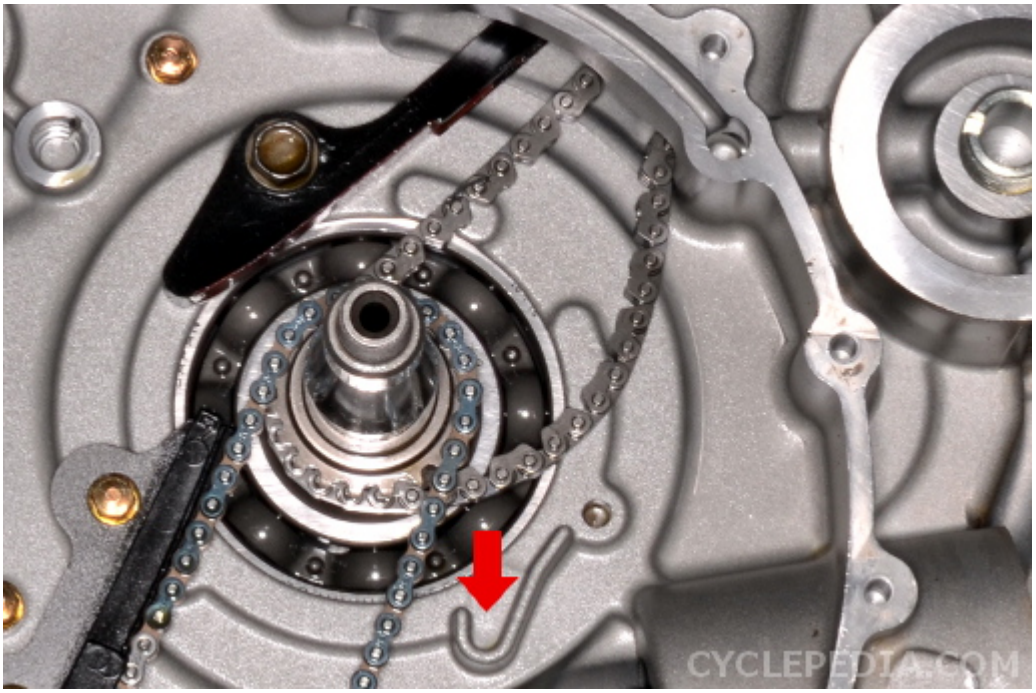
Cylinder head warpage limit	0.05 mm (0.002 in)



Check for warp in several places on the head. If the cylinder head is warped it must be resurfaced by a qualified machine shop or replaced.

Installation

Install the front cam chain guide into the cylinder as shown. Keep tension on the cam chain to keep it out of the way while inserting the cam chain guide.



Make sure the bottom of the cam chain guide fits securely in the crankcase boss.

Install the two cylinder head dowel pins.

Fit a new cylinder head gasket into place as shown.

Install the cylinder head to the cylinder. Guide the cam chain and cam chain guides though the opening in the cylinder head. Remember to keep the cam chain from falling into the bottom end of the engine.

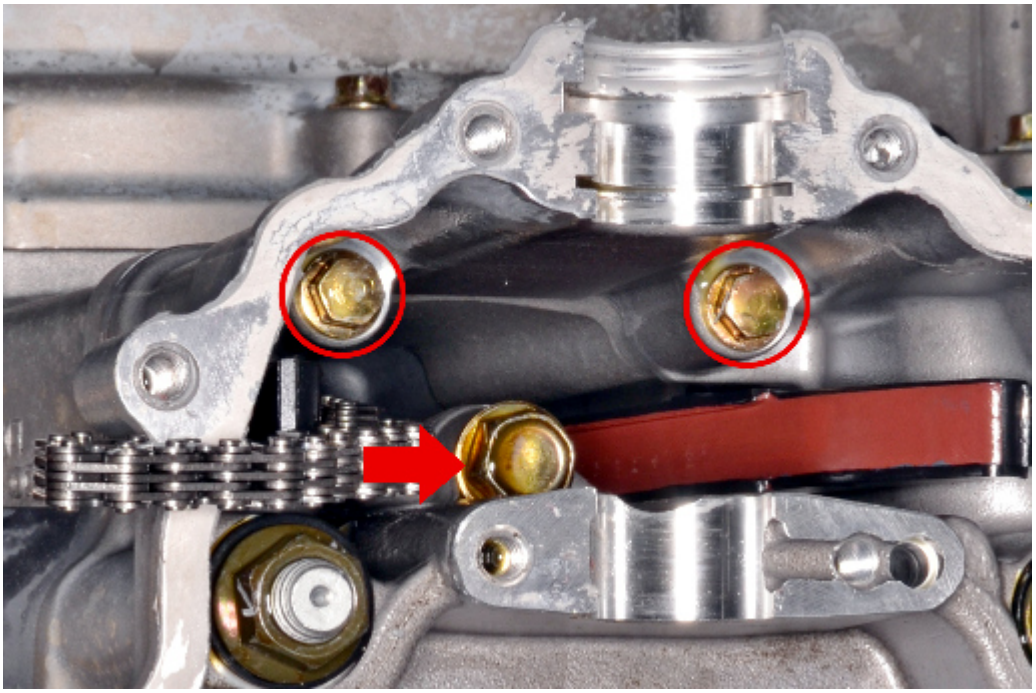
Apply fresh engine oil to the threads and washers of the cylinder head nuts.

Install the four cylinder head nuts with washers and torqu them to specification with a 14 mm socket.

THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
	N-m	ft-lb	

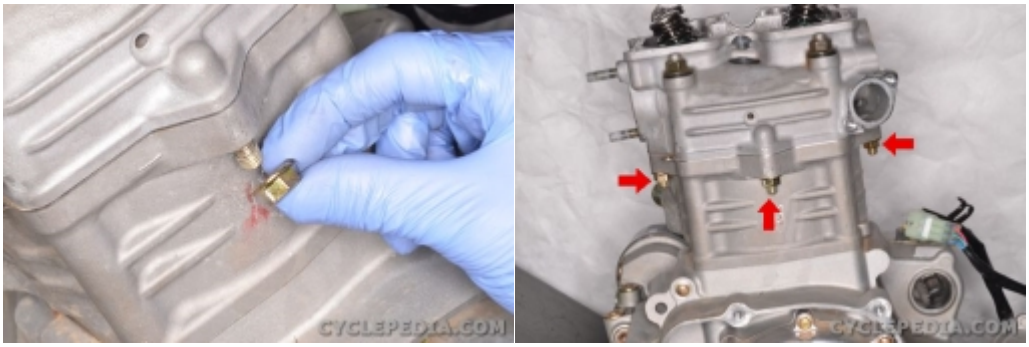
NUT M10 x 1.0	47	34.7	APPLY OIL

Apply fresh engine oil to the threads of the three cylinder head bolts. Install the three cylinder head bolts.



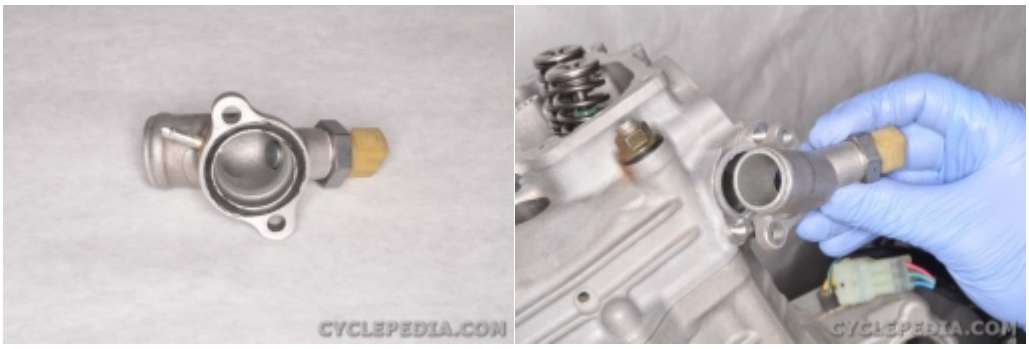
Tighten the cylinder head bolts to specification.

THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
	N-m	ft-lb	
BOLT M6 x 1.0	11.8	8.7	APPLY OIL
BOLT M8 x 1.25	10.8 ± 0.1	8	APPLY OIL



Apply fresh engine oil to the threads of the cylinder head nuts. Install the three nuts under the cylinder head and tighten them to specification with a 12 mm wrench.

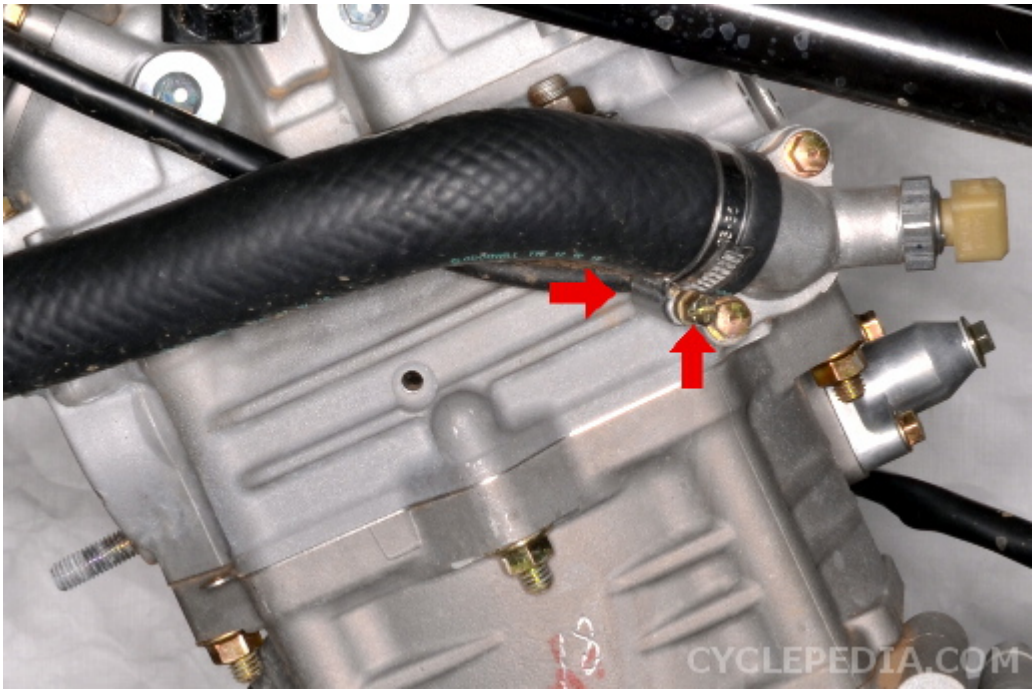
THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
	N-m	ft-lb	
NUT M8 x 1.25	24.5± 1 .2	18	APPLY OIL



Install the WTS housing with a new gasket.

Install the two WTS housing bolts and tighten them securely with an 8 mm socket.

THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
	N-m	ft-lb	
BOLT M6 x 1.0	11.8	8.7	APPLY OIL



Connect the air bleed hose and thermostat hose to the WTS housing. Secure the hoses with the clamps.

Plug in the WTS sensor connector.

Install these components	
Component	Topic
Camshaft	Camshaft Installation
Rocker cover	Rocker Cover
Spark plug	Spark Plug

Throttle body	Throttle Body Removal and Installation
Exhaust system	Exhaust System
Fuel tank and shield	Fuel Tank
Fill the coolant	Coolant
Side covers	Side Covers
Seat	Seat

Valves

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

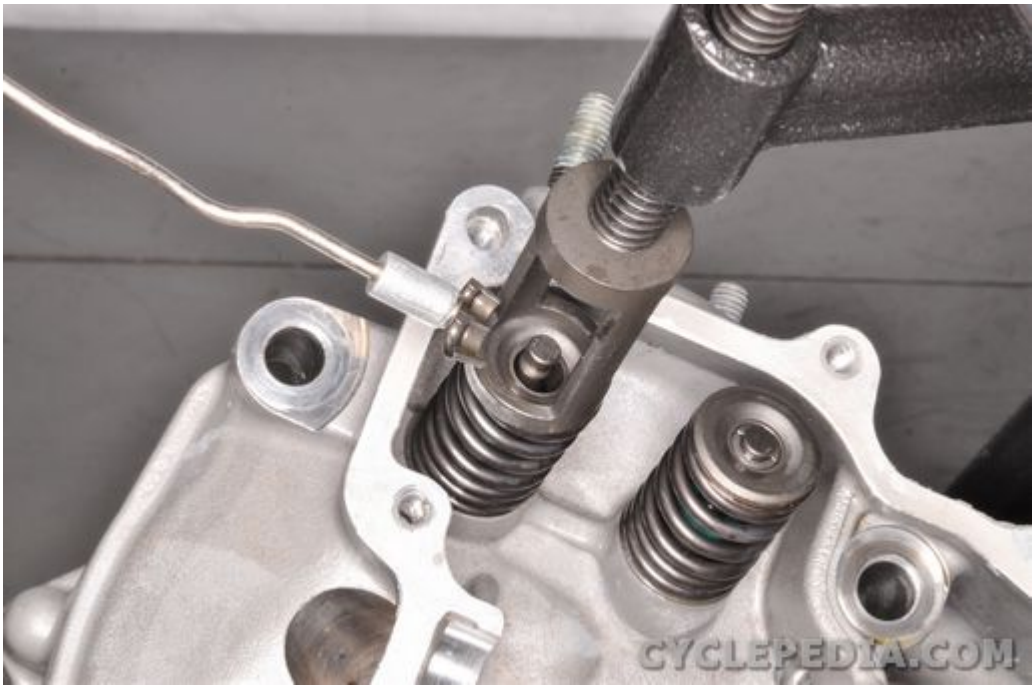
Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Spark plug	Spark Plug
Cylinder head cover	Rocker Cover
Camshaft	Camshaft
Exhaust system	Exhaust System
Drain the coolant	Coolant
Throttle body and intake pipe	Throttle Body Removal and Installation
Cylinder head	Cylinder Head

Note the location of all of the valve parts so that they can be returned to their original positions. Remove all of the valves in the same manner.

Use a valve spring compressor to remove the valves.

Special Tools- Valve Spring Compressor: A120E00040

Compress the valve springs only enough to remove the cotters.



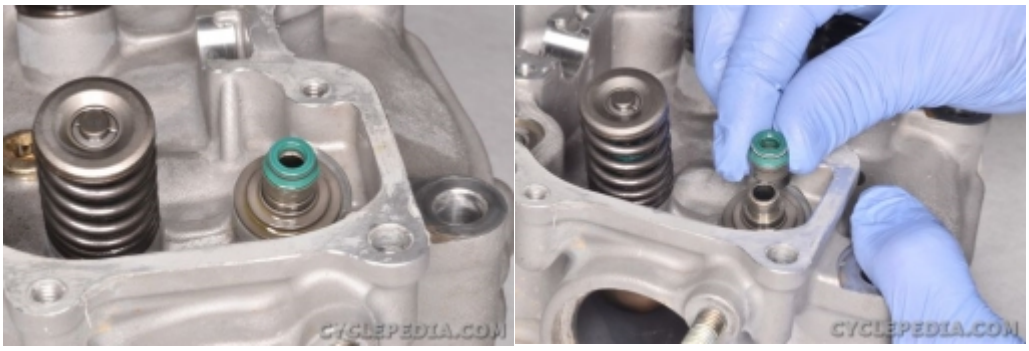
Remove the cotters from the valve stem with tweezers or a magnet.

Remove the spring retainer.

Lift out the outer and inner valve springs.

Outer Valve Spring Length	Inner Valve Spring Length
43 mm	37.5 mm

Push the valve out through the bottom of the cylinder head.



Remove the stem seal with needle nose pliers and a pick. Discard old stem seals.

Remove the spring seat.

Inspection

Caution: If valves are discolored or pitted or If the seating surface is worn, the valve must be replaced. Do not attempt to grind the valves or severe engine damage may occur.

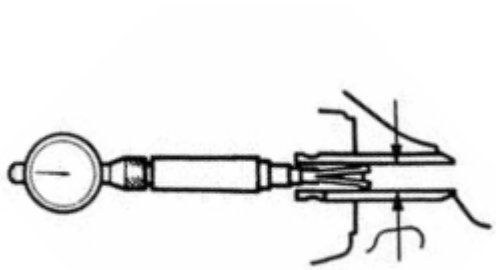
If valves, valve guides, or valve seats require servicing this should be completed by a qualified machine shop.

Measure the free length of the valve springs with vernier calipers.

Item		Standard
Valve Spring Free Length (IN and EX)	INNER	43 mm
	OUTER	37.5 mm

Inspect the valve for damage. Measure the valve stem diameter with a micrometer or vernier calipers and compare the measurements with specification. Replace any valves that do not meet the standard.

Item		Standard mm (in)
Valve stem O.D.	IN	5.975 - 5.99 (0.235 - 0.2358)
	EX	5.955 - 5.97 (0.2344 - 0.2350)



Measure the inside diameter of the valve guides. Replace the guides if the measurement is out of specification. Calculate the valve stem-to-guide clearance. Replace the guide and valve if the clearance is out of specification.

Item		Standard mm (in)
Valve guide I.D.	IN	6 - 6.012 (0.2362 - 0.2367)
	EX	6 - 6.012 (0.2362 - 0.2367)
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)
	EX	0.03 - 0.057 (0.0012 - 0.0023)

Assembly

Make sure to return the components to their original locations.

Install the spring seat.

Lubricate the new valve stem seals with fresh engine oil. Install new valve stem seals. Push the seals straight onto the guide.

Coat the valve stem and end in fresh engine oil. Insert the valve through the valve guide. Twist the valve slowly to work it through the stem seal without damaging the seal. The valve should move smoothly in the guide and make good contact with the seat.

Install the valve springs with their tightly spaced coils facing down. Note: Their are two valve springs per valve.

Install the spring retainer.

Use a valve spring compressor to install the cotters. Compress the valve springs only enough to install the cotters.

Special Tools- Valve Spring Compressor: A120E00040

Apply grease to the inside of the cotters. Apply a dab of grease to the end of a flat blade screwdriver. Set the keeper in the grease on the screwdriver and insert it onto the valve stem. Repeat this with the other keeper.

After the valves have been reassemble place a clean shop towel under the cylinder head in the combustion chamber area. Place a plastic rod against the top of the valve stem and gently tap the plastic rod with a rubber mallet to make sure the valve and cotters are seated properly.

Install these components	
Component	Topic
Cylinder head	Cylinder Head
Camshaft	Camshaft Installation
Cylinder head cover	Rocker Cover

Spark plug	Spark Plug
Throttle body	Throttle Body Removal and Installation
Exhaust system	Exhaust System
Fuel tank and shield	Exhaust System
Fill the coolant	Coolant
Side covers	Side Covers
Seat	Seat

Cam Chain

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Mudguards	Mudguards and Footrests
Spark plug	Spark Plug
Drain the engine oil	Engine Oil
Camshaft	Camshaft
Exhaust system	Exhaust System
Drain the coolant	Coolant
Throttle body and intake pipe	Throttle Body Removal and Installation
Rocker cover	Rocker Cover
Cylinder head	Cylinder Head
Cylinder	Cylinder and Piston
Water pump cover	Water Pump
Generator cover	Generator Cover
Generator flywheel	Flywheel
Oil pump chain	Oil Pump

Remove the intake side cam chain guide bolt. Remove the intake side cam chain guide from above.

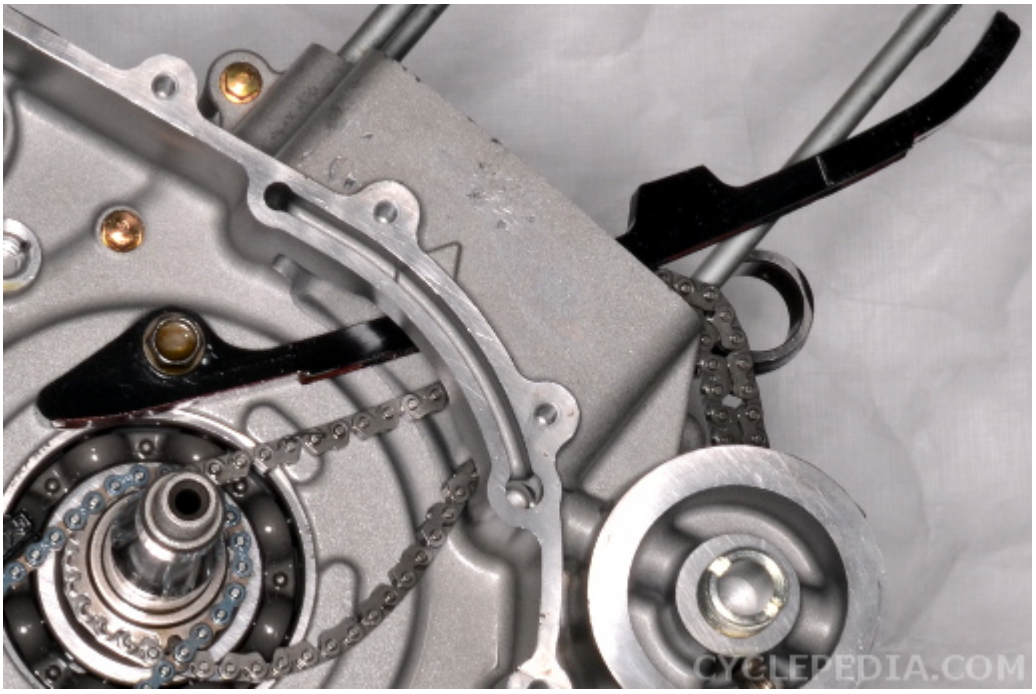
Inspect the cam chain guide for excessive wear and damage.

Remove the cam chain.

Inspect the cam chain for kinking, sticking, fatigue, and damage. Replace the cam chain as needed.

Installation

Fit the cam chain into place on the timing sprocket located on the crankshaft.



Install the intake side cam chain guide and bolt. Tighten the bolt to specification.

ITEM	N-m	kgf-m	ft-lb
Cam chain guide pivot bolt	20	2.0	15

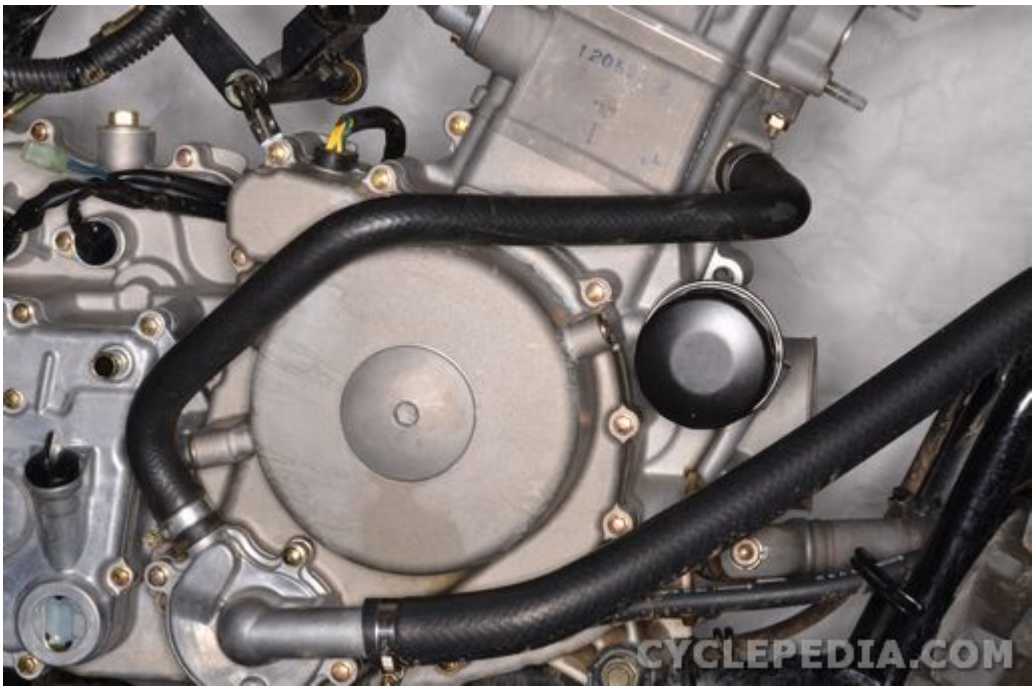
Install these components	
Component	Topic
Oil pump	Oil Pump
Generator flywheel	Flywheel
Generator cover	Generator Cover
Water pump cover	Water Pump
Cylinder	Cylinder and Piston
Cylinder head	Cylinder Head
Camshaft	Camshaft Installation
Rocker cover	Rocker Cover
Throttle body and intake pipe	Throttle Body Removal and Installation
Exhaust system	Exhaust System
Spark plug	Spark Plug
Fill the coolant	Coolant
Fill engine oil	Engine Oil
Mudguards	Mudguards and Footrests
Side covers	Side Covers
Fuel tank and shield	Fuel Tank
Seat	Seat

Cylinder and Piston

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank
Side covers	Side Covers
Spark plug	Spark Plug
Rocker cover	Rocker Cover
Camshaft	Camshaft
Exhaust system	Exhaust System
Drain the coolant	Coolant
Throttle body and intake pipe	Throttle Body Removal and Installation
Cylinder head	Cylinder Head



Loosen the cylinder coolant hose clamp with a #2 Phillips screwdriver. Free the coolant hose from the cylinder.

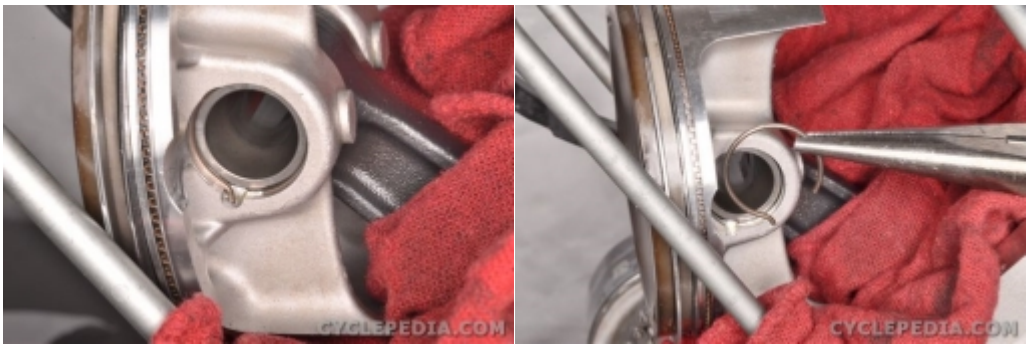
Gently tap the cylinder with a rubber mallet to free it from the dowel pins.

Lift the cylinder up and off of the crankcases. Guide the cam chain through its opening in the cylinder. Make sure the cam chain and dowel pins do not fall into the bottom end of the engine.

Lift off the base gasket.

Remove the two dowel pins.

Place a clean shop towel around the base of the piston to prevent any parts or debris from falling into the crankcase.

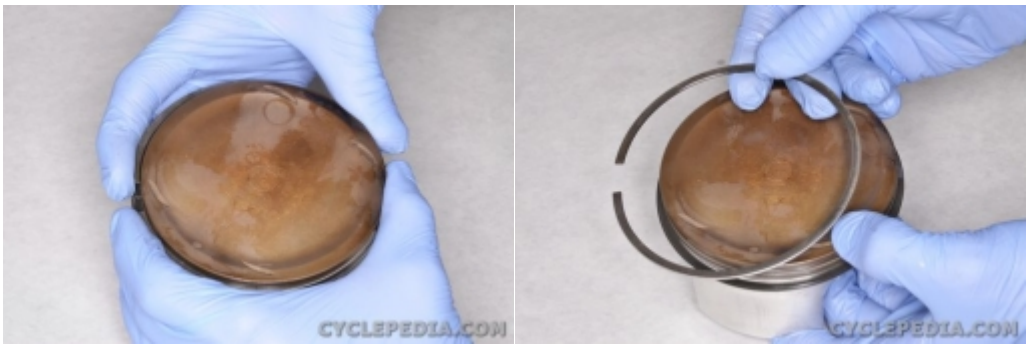


Remove the piston pin clip with a pick or needle nose pliers. Remove both piston pin clips and discard them.

Slide out the piston pin. Use a suitable piston pin puller tool if needed. Do not use a punch and a hammer to remove the pin.

Remove the piston. Clean off the cylinder mating surface, but take care to keep debris from falling into the crankcase.

Clean the carbon build up off of the piston with a stiff bristled plastic brush. Never use a wire brush to clean a piston.

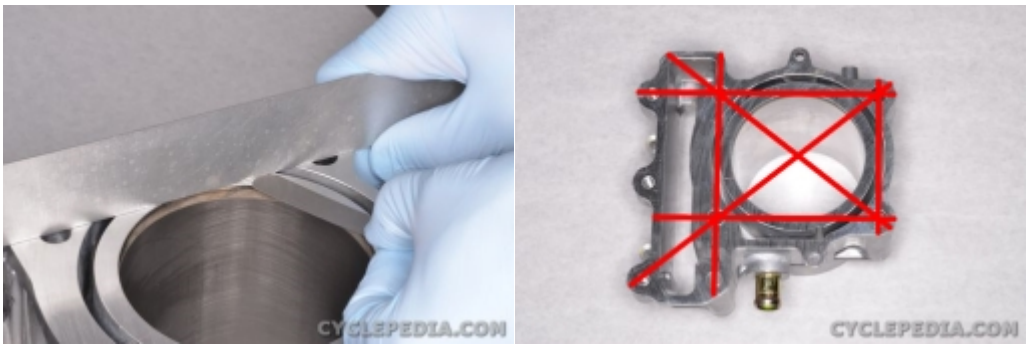


Spread the piston rings and lift them off opposite the gap. Spread the rings the minimum amount during removal. The rings can be easily damaged. There is a top ring, second ring, and oil expander ring with two side rails.

Clean out the ring grooves. You can use an old ring to scrape out any built up carbon in the grooves. Grind the old ring end to a 45° angle and a sharp edge to make an effective scraper tool.

Inspection

Cylinder Warp



Test for cylinder warp with a straight edge and a feeler gauge. Try and insert the feeler gauge of the service limit under the straight edge. Place the straight edge in several places on the head.

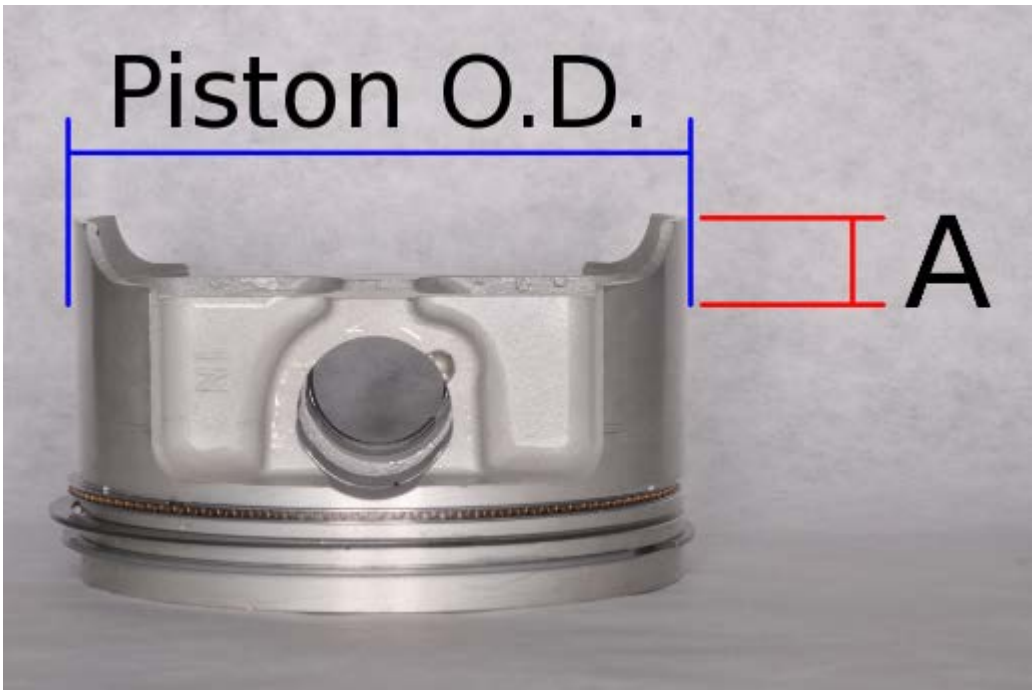
Item	Service Limit
Cylinder warpage across top	0.05 mm (0.002 in)

Place the cylinder upside down on the surface plate covered with #400 grit wet-or-dry sandpaper. Using light pressure, move the cylinder in a figure eight motion. Inspect the mating surface for any indication of high spots A high spot can be noted by a bright metallic finish. Correct any high spots before assembly by continuing to move the cylinder in a figure eight motion until a uniform bright metallic finish is attained.

Caution: Do not remove an excessive amount of material from the cylinder.

Caution: Water or parts-cleaning solvent must be used In conjunction with the wet-or-dry sandpaper or damage to the sealing surface may result.

Piston Diameter

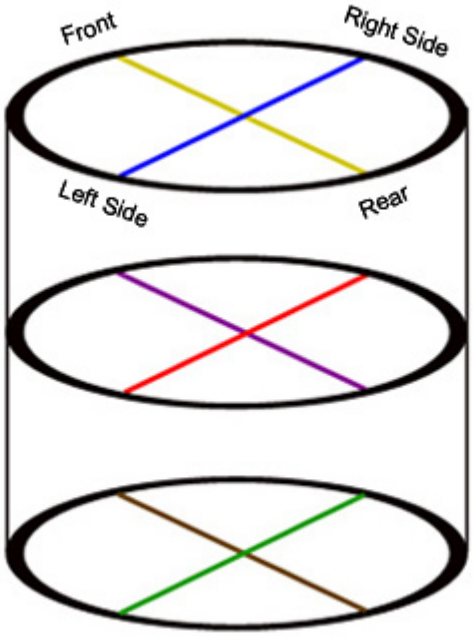


Measure the diameter of the piston 10 mm (A) up from the bottom of the skirt at a 90° angle to the piston pin. Measure the piston with a micrometer. Replace the piston if the measurement is out of specification. Check the piston for wear and extreme discoloration.

Piston Diameter 10 mm up from the base of the skirt	101.975 - 101.985 mm (4.0148 - 4.0152 in)

Cylinder Bore

Inspect the cylinder and measure side to side at three different height levels with a dial bore gauge or cylinder gauge set.

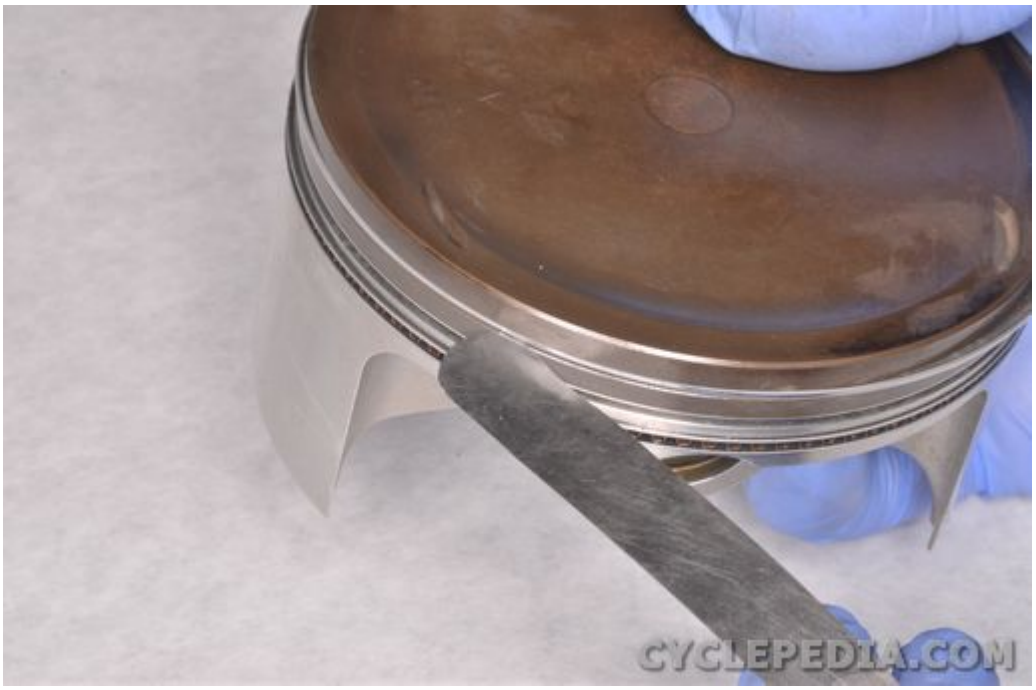


Subtract the diameter of the piston from the maximum front to rear diameter measurement of the cylinder to calculate the piston-to-cylinder clearance. Calculate the cylinder out of round. The out of round is greatest out of yellow, purple, or brown minus the smallest of blue, red, or green.

Item		Standard mm (in)	Service Limit
Piston	Piston-to-cylinder clearance	0.015 - 0.035 (0.0006 - 0.0014)	0.1 (0.004)
Cylinder	Inside Diameter	102 - 102.01 (4.0158 - 4.0161)	102.1 (4.0197)
	Taper	0.01 (0.0004)	0.1 (0.004)
	Out-of-round	0.01 (0.0004)	0.1 (0.004)

If the cylinder has obvious damage or is out of specification it must be replaced with the piston as a set.

Piston Ring Groove Width and Ring-to-Groove Clearance

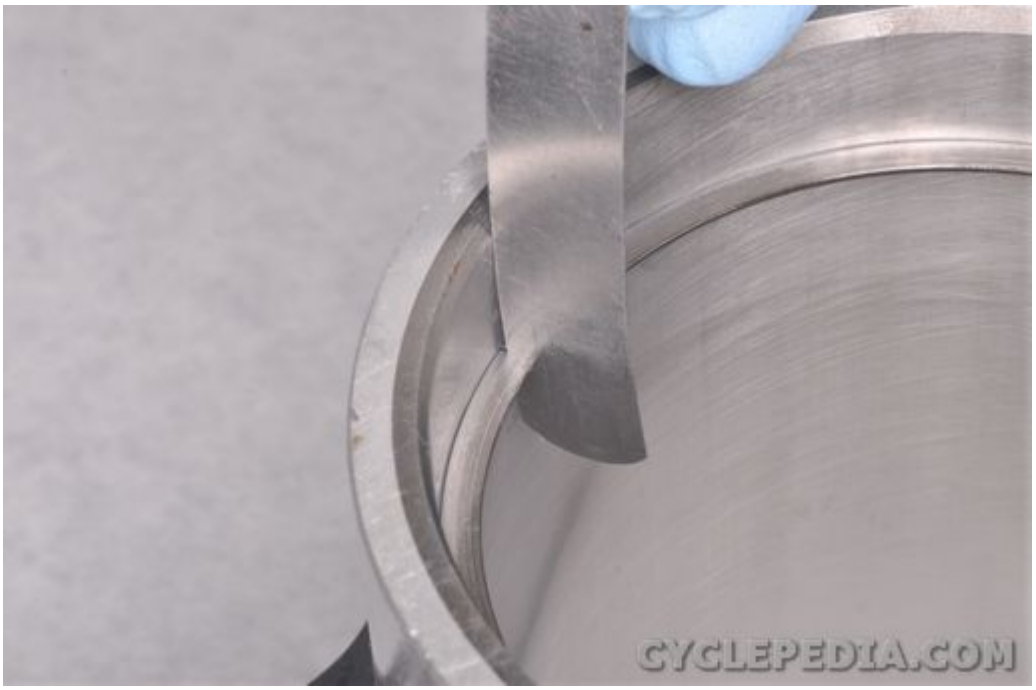


Check the ring groove width and ring-to-groove clearance with a feeler gauge. Make sure the ring is in the correct grove. Replace the piston if the ring groove width is out of specification. The ring should be able to rotate in the groove.

Item			Standard mm (in)	Service Limit
Piston	Ring-to-groove clearance	top	0.03 - 0.07 (0.0012 - 0.0028)	0.08 (0.003)
		Second	0.02 - 0.06 (0.0008 - 0.0024)	0.065 (0.0026)

Piston Ring End Gap

Insert the top ring into the cylinder. Push the top ring in the cylinder. Use the piston to push in the ring to keep it square with the cylinder.



Measure the ring gap with a feeler gauge. Repeat this procedure with second ring.

Item		Standard mm (in)	Service Limit
Ring end gap	top	0.25 - 0.35 (0.0098 - 0.0138)	0.5 (0.02)
	Second	0.7 - 0.9 (0.0276 - 0.0354)	-
	Oil side rail	0.2 - 0.7 (0.008 - 0.028)	1 (0.04)

Piston Pin O.D.

Measure the piston pin outside diameter with a micrometer. Measure in several locations to insure an accurate measurement.

Piston pin O.D.	22.997 - 23 mm(0.9053 - 0.9055 in)

Piston Pin Bore I.D.

Measure the piston pin bore diameter with vernier calipers or dial gauge with a small bore gauge. Measure in several spots to insure an accurate measurement.

Item	Standard mm (in)	Service Limit
Piston pin hole I.D.	23.006 - 23.012 (0.9057 - 0.9060)	23.04 (0.9071)

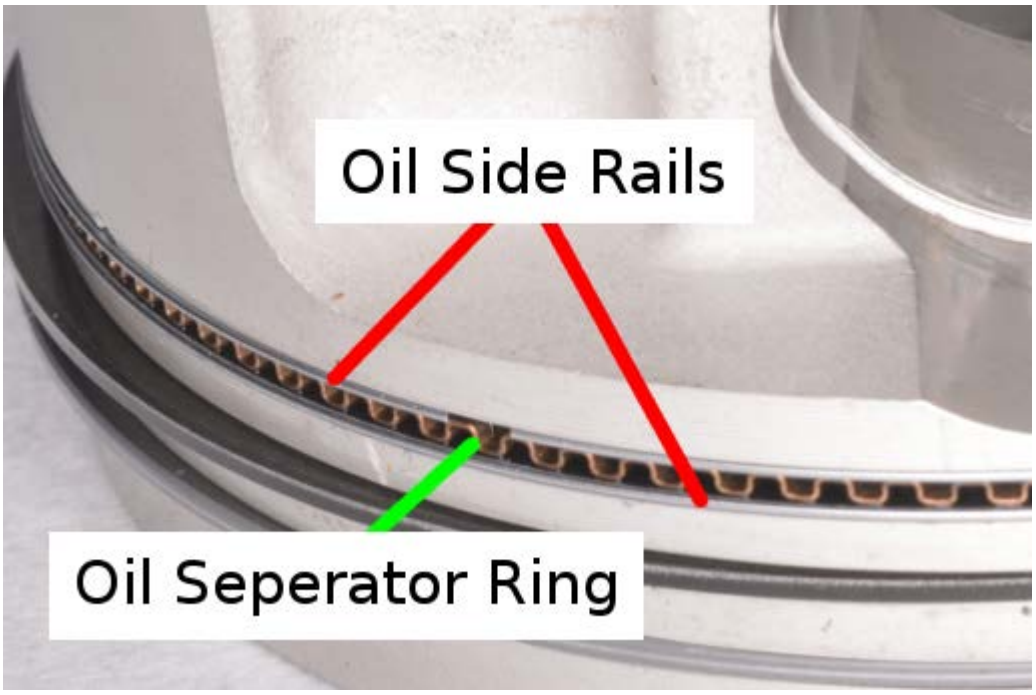
Connecting Rod Small End

Measure the inside diameter of the small end of the connecting rod. If the small end of the connecting rod is out of specification the crankshaft and rod must be replaced.

Item	Standard mm (in)	Service Limit
Connecting rod small end I.D. bore	22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

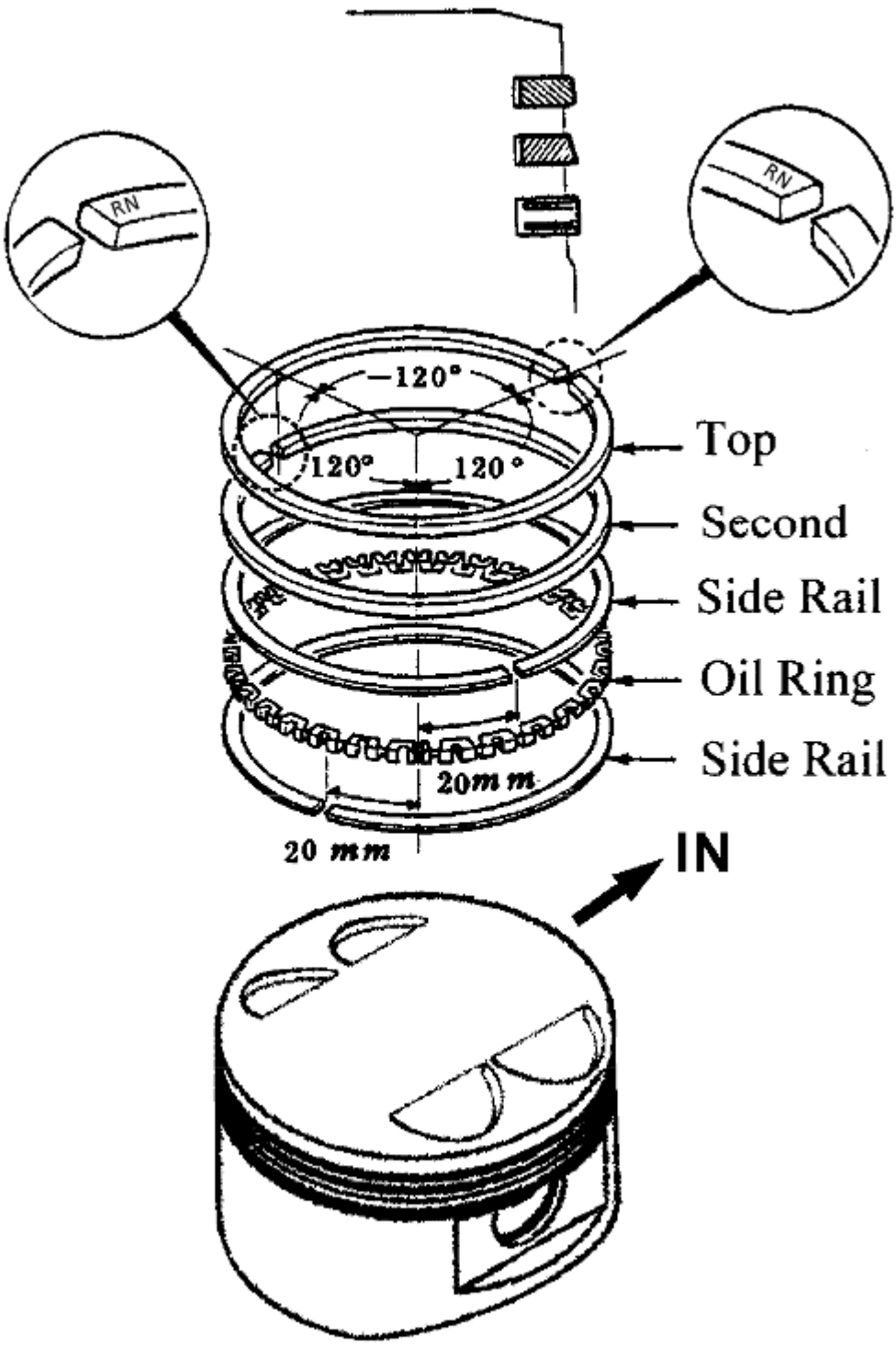
Assembly

Clean the piston ring grooves, and apply fresh engine oil to the piston rings. Spread the rings the minimum amount possible to install them.



Install the oil ring first then the steel rails above and below the oil ring.

Install the rings with their markings facing up.



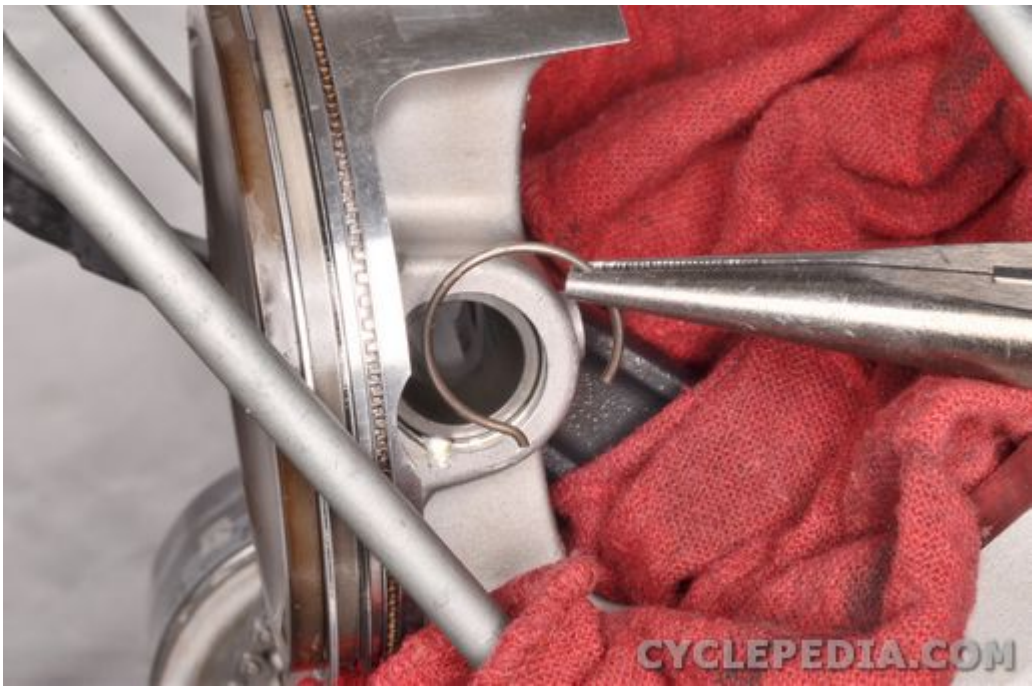
Position the ring end gaps as shown above.

Caution: Incorrect installation of the piston rings will result in engine damage.

Lubricate the piston pin and the small end of the connecting rod with fresh engine oil.

Install the piston onto the connecting rod. The IN marks on the piston must sit on the intake side of the engine.

Insert the piston pin.



Place a clean shop towel around the base of the piston to prevent any parts or debris from falling into the crankcase. Install new piston pin clips securely into their grooves.

Make sure the piston pin clips sit with their turned out end in the gap as shown.

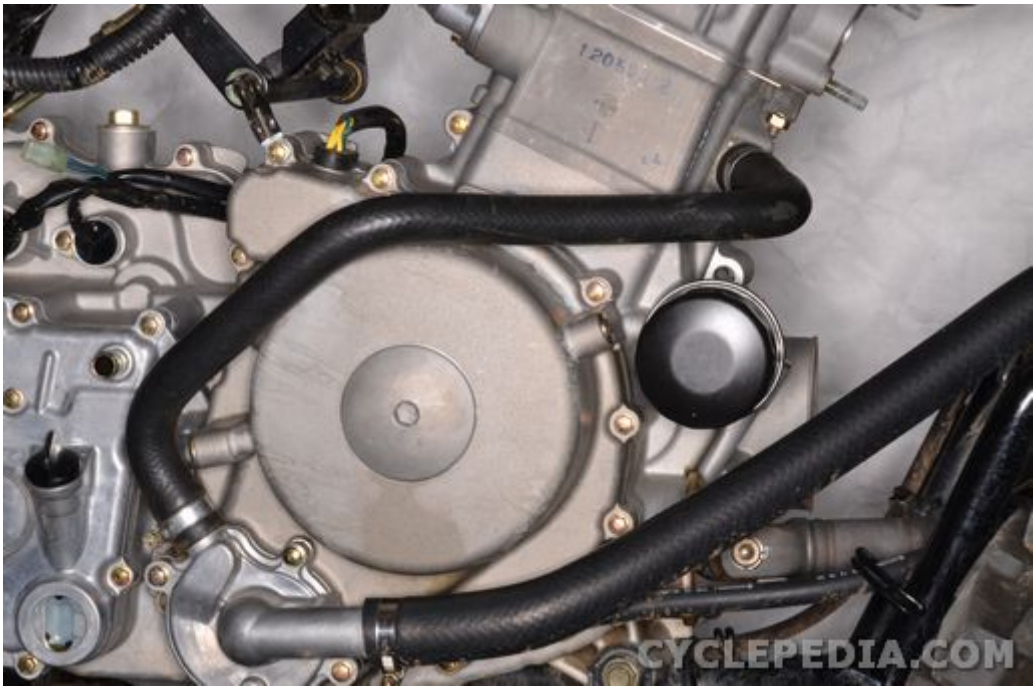
Make sure the cylinder mating area is clean. Install the two dowel pins.

Install the new base gasket.

Coat the inside of the cylinder, piston rings, and piston in fresh engine oil. Lower the cylinder into place and guide the piston into the cylinder while you are compressing the rings with your fingers. Be careful to not damage the rings during this step. Bring the cam chain through the opening.

Caution: The cylinder should slide on easily. Do not force the cylinder or damage to the piston, rings, cylinder, or crankshaft assembly may occur.

Caution: Keep tension on the cam chain to avoid damaging the crankcase boss.



Connect the coolant hose to the cylinder. Tighten the cylinder coolant hose clamp securely with a #2 Phillips screwdriver.

Install these components	
Component	Topic
Cylinder head	Cylinder Head
Camshaft	Camshaft Installation
Rocker cover	Rocker Cover
Spark plug	Spark Plug
Throttle body	Throttle Body Removal and Installation
Exhaust system	Exhaust System
Fuel tank and shield	Fuel Tank
Fill the coolant	Coolant
Side covers	Side Covers
Seat	Seat

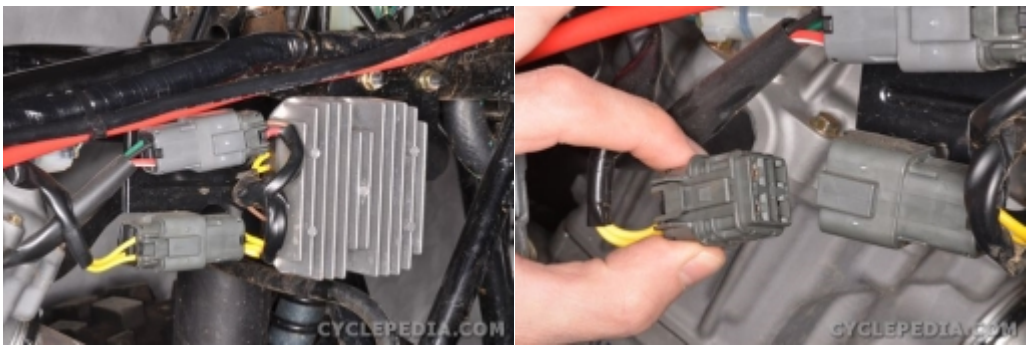
Generator Cover

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

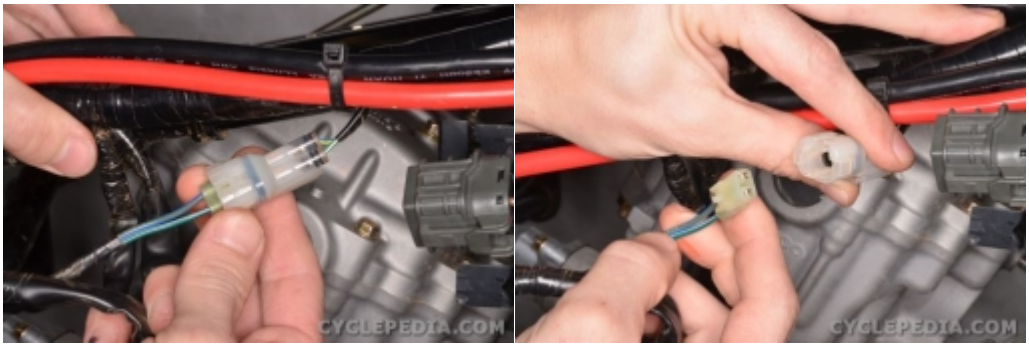
Removal

Remove these components	
Component	Topic
Side covers	Side Covers
Mudguard	Mudguards and Footrests
Drain the engine oil	Engine Oil
Drain the coolant	Coolant
Water pump cover	Water Pump

Trace the wires up from the generator cover.

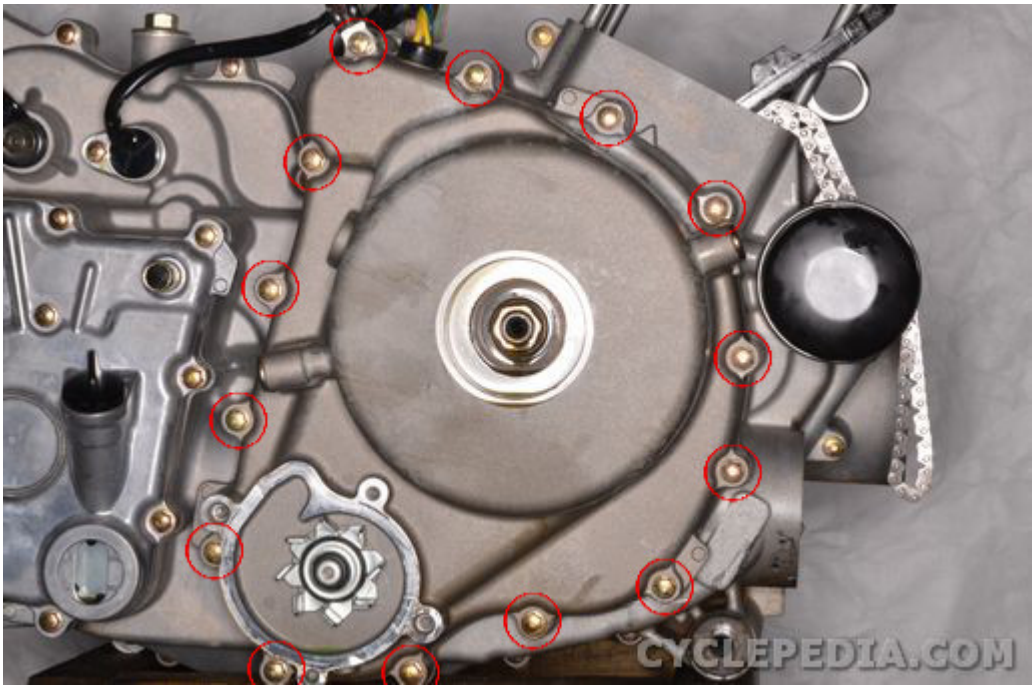


Unplug the 4-pin stator connector.

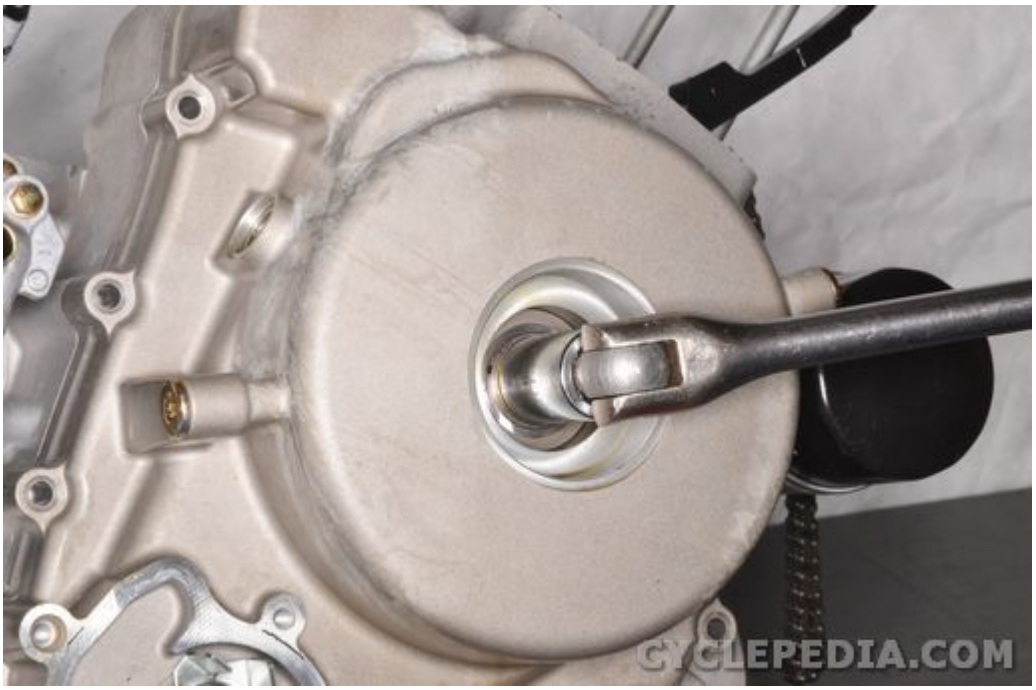


Unplug the 2-pin ignition pulse generator / crank position sensor connector.

Remove the crankshaft cap on the left side of the engine with a 10 mm Allen socket.

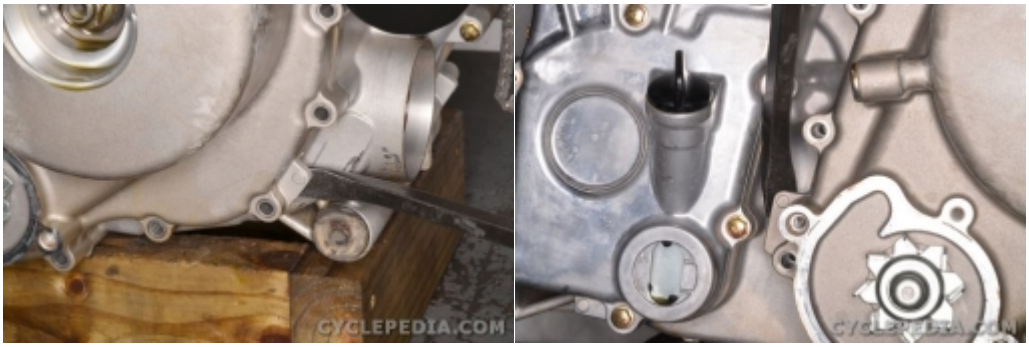


Loosen the generator cover bolts evenly in a crisscross pattern with an 8 mm socket. Remove the generator cover bolts.



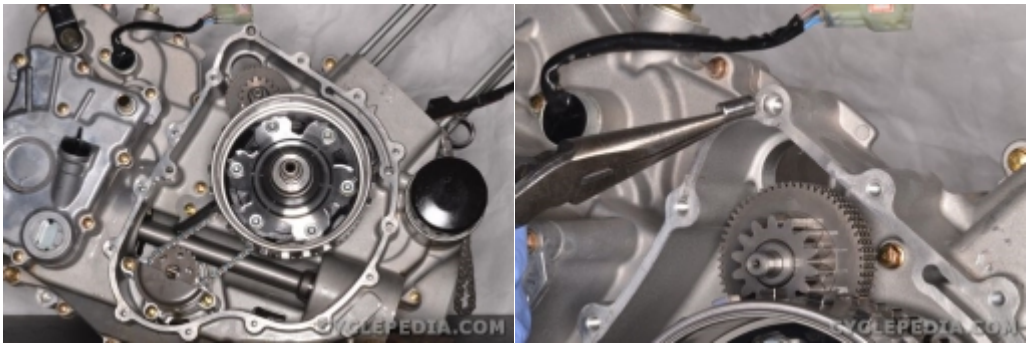
Hold the drive pulley with a drive pulley holder tool so the crankshaft doesn't turn. See the CVT Removal topic for more information. Loosen the flywheel nut with a socket.

Remove the flywheel nut and washer.



Utilize the pry points to free the generator cover from the crankcase.

Remove the generator cover.



Remove the dowel pins. Remove the generator cover gasket.

Remove the boss from the bearing in the generator cover.

Inspect the boss and oil ring for wear and damage. Replace them as needed.

Stator and Crank Position Sensor

The stator and crank position sensor must be removed together.

Remove the three stator coil mounting bolts with an 8 mm socket. Remove the two crank position sensor bolts and wire guide bolt with an 8 mm socket.

Free the crank position sensor and rubber wire grommet from the generator cover.

Lift out the stator and ignition pulse generator together.

To remove the flywheel see the Flywheel topic

Bearing

Insect the bearing in the generator cover.

If the bearings in the generator cover needs to be replaced remove the snap ring. Drive out the old bearing from the outside.

Drive in the new bearing with a suitable driver that is the same outside diameter as the bearing. Make sure the bearing is fully seated and square in the cover.

Install a new snap ring into the groove with snap ring pliers.

Installation

Stator and Ignition Pulse Generator

Fit the stator and ignition pulse generator into the cover together.

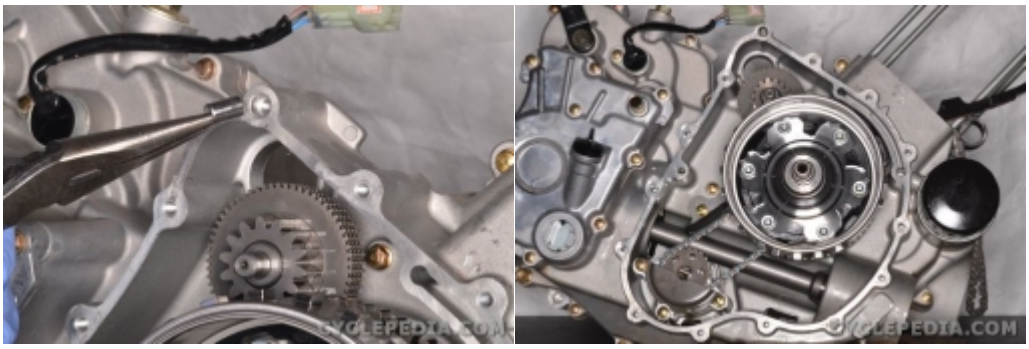
Install the three stator coil mounting bolts and tighten them securely with an 8 mm socket. Install the two ignition pulse generator bolts. Tighten them securely with an 8 mm socket.

Apply silicone sealant to the wire grommet and fit it into the groove in the cover.

Generator Cover

Make sure the generator cover mating surface is clean and free of the old gasket material.

Lubricate the bearing and the ring of the boss with fresh engine oil Fit the boss into the cover and bearing from the outside.

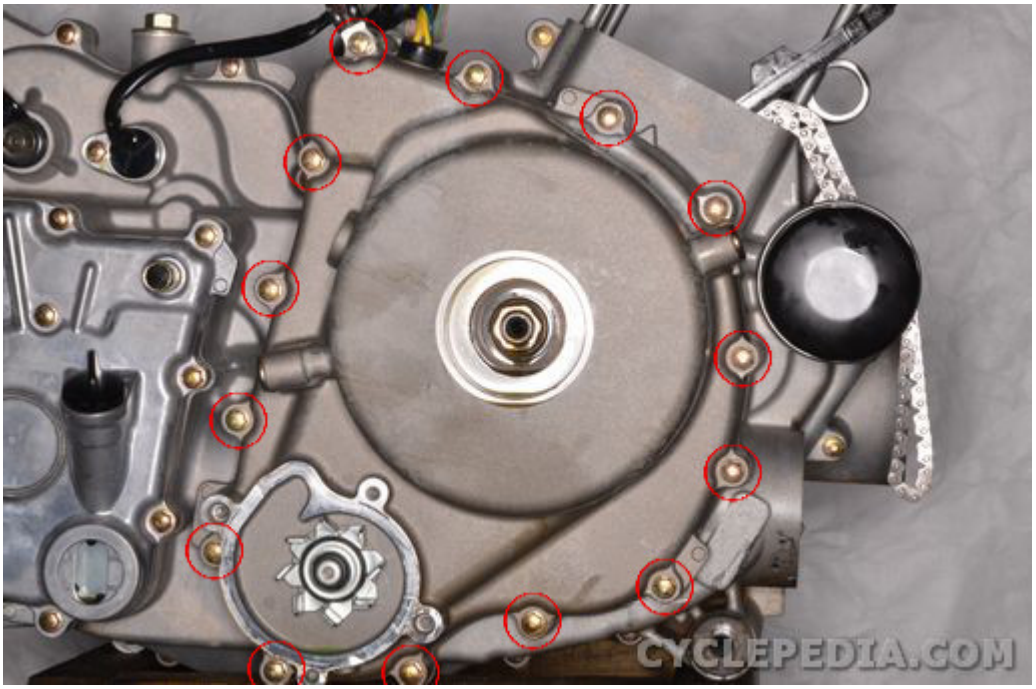


Install the two dowel pins and a new generator cover gasket.

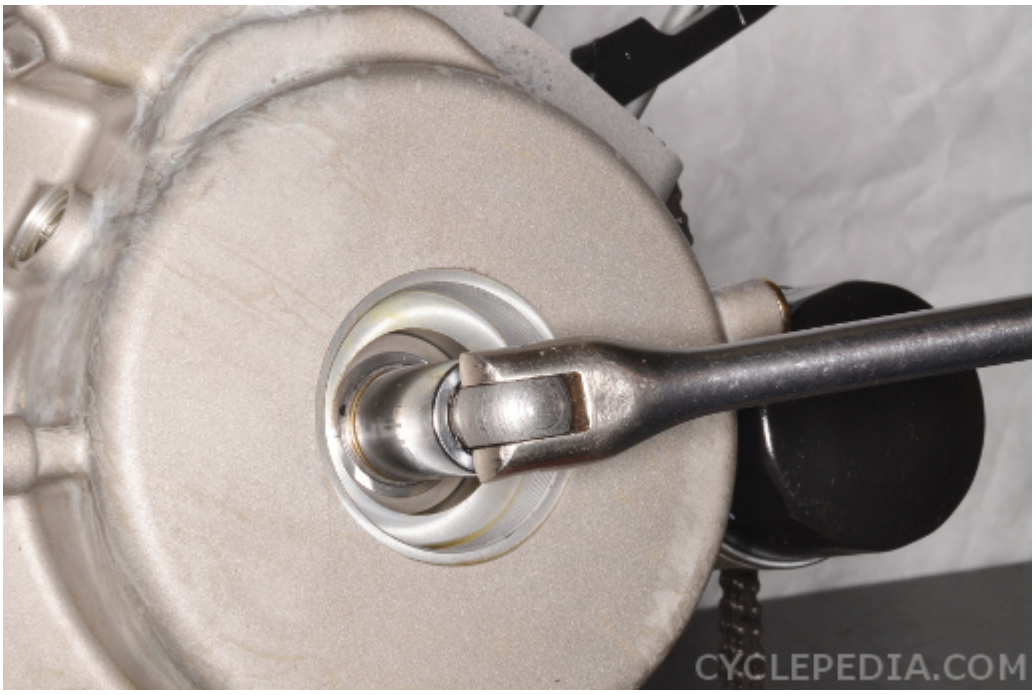
Fit the generator cover into place.

Rotate the water pump impeller to line up the slot in the shaft with the projection on the oil pump.

Place the washer on the crankshaft and thread on the nut.



Thread in the generator cover bolts. Install the wire clamp with the top bolt.



Hold the drive pulley with a drive pulley holder tool so the crankshaft doesn't turn. See the CVT Removal topic for more information. Tighten the generator flywheel nut to specification.

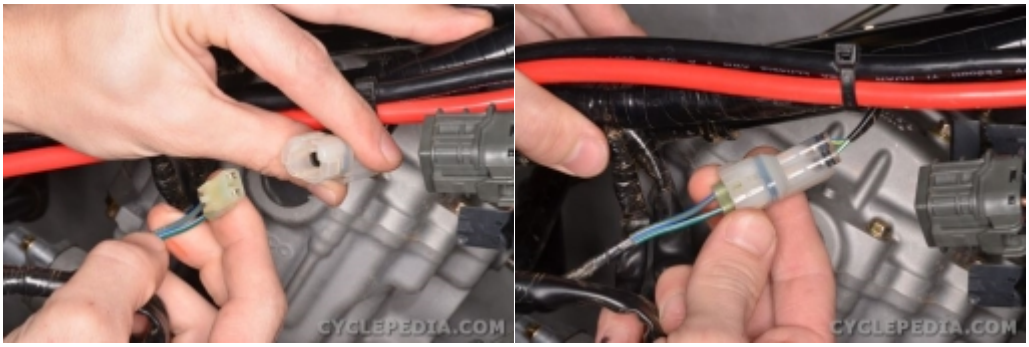
ITEM	THREAD SIZE AND TYPE	TORQUE VALUES	
		N-m	ft-lb
ACG FLYWHEEL	N.F. M14	49-58.9	36.1-43.4

Tighten the generator cover bolts evenly with an 8 mm socket.

Install the crankshaft cap.

Tighten the crankshaft cap securely with a 10 mm Allen socket. Do not over tighten this cap.

Plug in the 4-pin stator connector.



Plug in the 2-pin ignition pulse generator / crank position sensor connector.

Install these components	
Component	Topic
Water pump cover	Water Pump
Fill the engine oil	Engine Oil
Fill the coolant	Coolant
Mudguards	Mudguards and Footrests
Side covers	Side Covers

Flywheel

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Side covers	Side Covers
Right mudguard	Mudguards and Footrests
Drain the engine oil	Engine Oil
Drain the coolant	Coolant
Water pump cover	Water Pump
Generator cover	Generator Cover

Flywheel

To remove the flywheel a special flywheel puller tool will be needed.

Special Tool- Flywheel Puller: E073

Install the thread protector onto the crankshaft.

Apply grease to the threads of the flywheel puller. Thread the puller onto the flywheel.

Hold the body of the puller with a large wrench and turn in the pusher bolt to separate the flywheel from the crankshaft.

Remove the flywheel from the crankshaft.

Remove the woodruff key from the crankshaft.

Remove the starter driven gear from the crankshaft.

Starter Clutch

The starter clutch is on the back of the flywheel.

Rotate the starter driven gear and fit in into the starter clutch as shown. Inspect the function of the starter clutch by turning the starter driven gear. The starter driven gear should only be able to rotate one direction. If the starter clutch allows the gear to turn either way, or will not turn smoothly it must be replaced.

Rotate the starter gear and remove it from the starter clutch on the back of the flywheel. Inspect the starter driven gear for wear and damage.

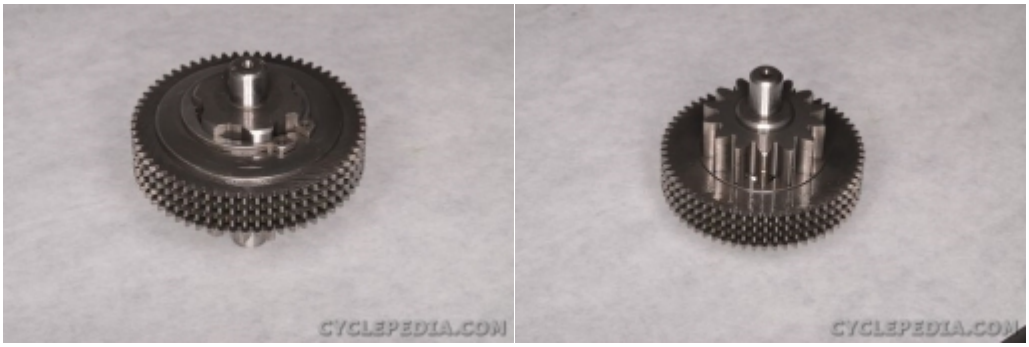
There are six bolts that hold the starter clutch to the back of the flywheel. Remove the starter clutch bolts from the outside of the flywheel with a 6 mm Allen.

Remove the starter clutch and mounting plate from the back of the flywheel.

Remove the starter clutch from the mounting plate.

Starter Reduction Gear

Remove the starter reduction gear from the crankcase.



Inspect the starter reduction gear components for wear and damage. Replace the parts as a needed.

Installation

Starter Clutch

Fit the starter clutch into the mounting plate.

Place the starter clutch and mounting plate on the back of the flywheel.

Apply a thread locking agent to the threads of the six starter clutch bolts. Insert the starter clutch bolts. Tighten the starter clutch bolts evenly and securely with a 6 mm Allen.

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
		N-m	ft-lb	
ACG ONE WAY	BOLT SOCKET M8x1.25	17.7-21 .6	13-15.9	APPLY THREAD LOCK

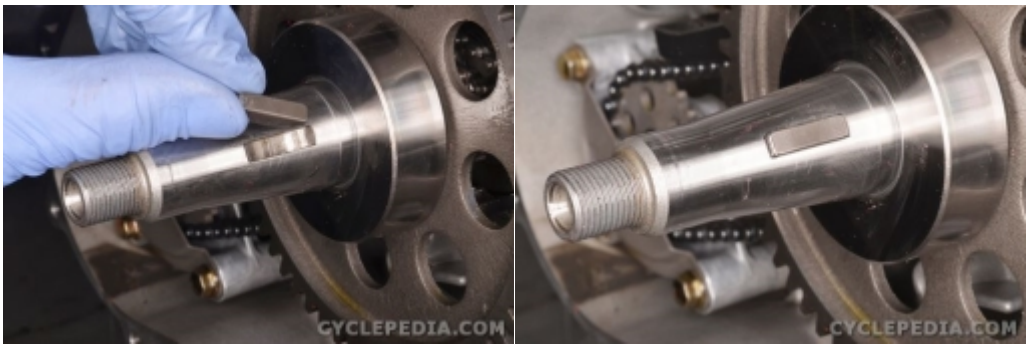
Starter Reduction Gear

Lubricate the starter reduction gear shaft with fresh engine oil. Install the starter reduction gear into the crankcase as shown.

Flywheel

Lubricate the starter driven gear boss and inside diameter with fresh engine oil.

Install the starter driven gear onto the crankshaft.



Install the woodruff key into the crankshaft. Make sure the tapered area of the crankshaft is clean, oil free, and dry.

Guide the flywheel onto the crankshaft make sure the key lines up with the groove in the flywheel. Rotate the starter driven gear if needed so that the boss fits into the starter clutch on the back of the flywheel.

Install these components	
Component	Topic
Generator cover	Generator Cover
Water pump cover	Water Pump
Fill the engine oil	Engine Oil
Fill the coolant	Coolant

Right mudguard	Mudguards and Footrests
Side covers	Side Covers

Clutch Removal

MXU500i

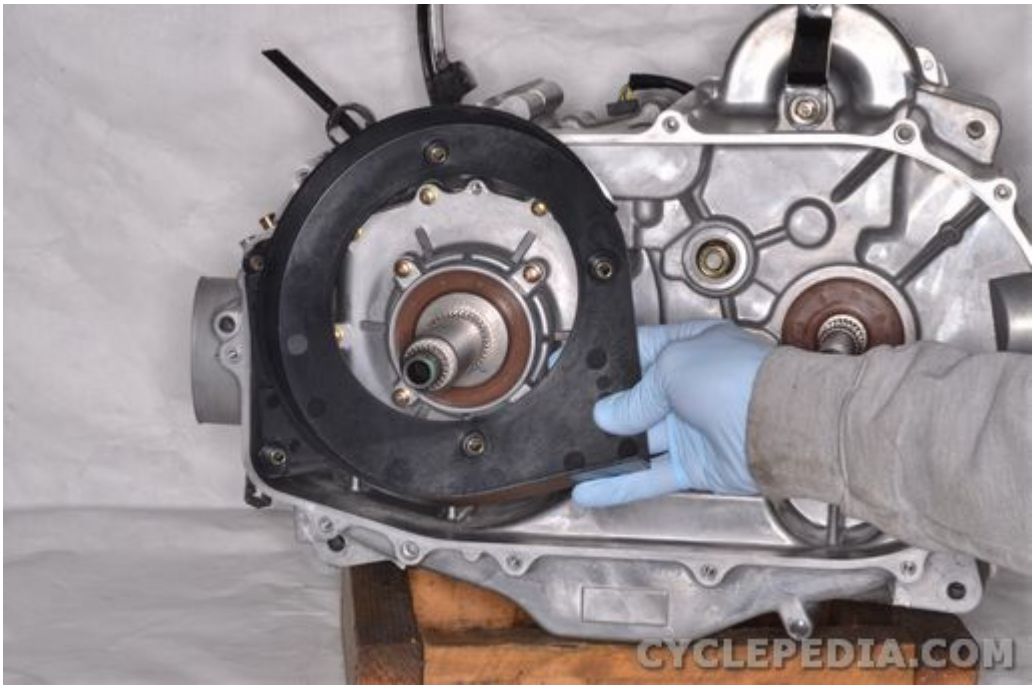
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

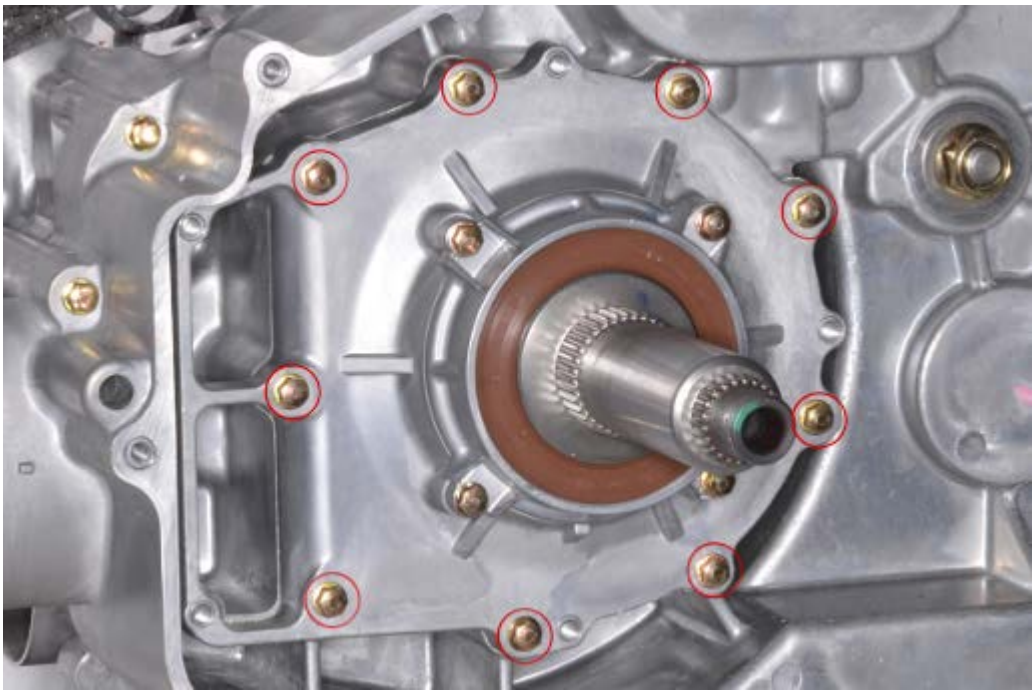
Remove the CVT belt case cover. See the Belt Case Cover topic for more information.

Remove the CVT pulleys and belt. See the CVT Removal topic for more information.

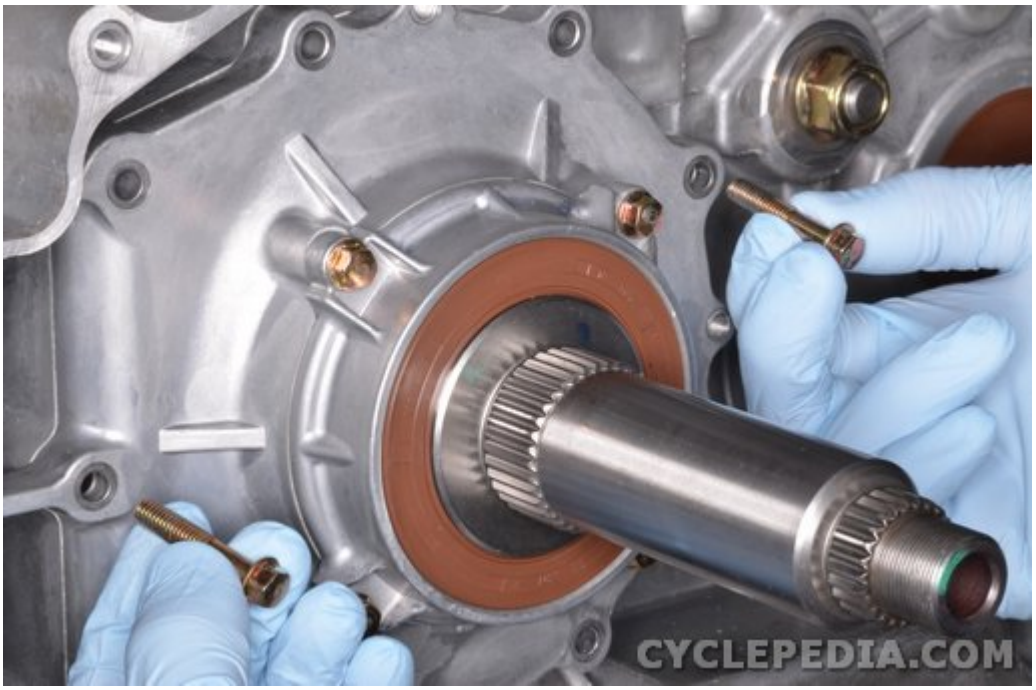
Remove the five CVT fan cover bolts with an 8 mm socket.



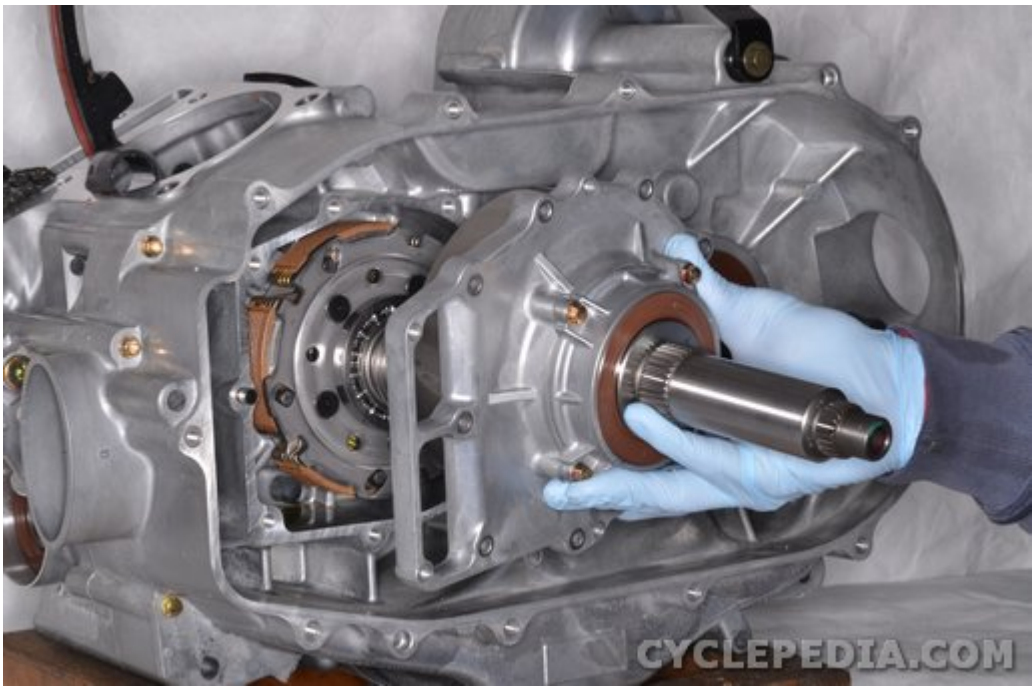
Remove the CVT fan cover.



Loosen the 9 clutch cover bolts a little bit at a time and in a crisscross pattern.

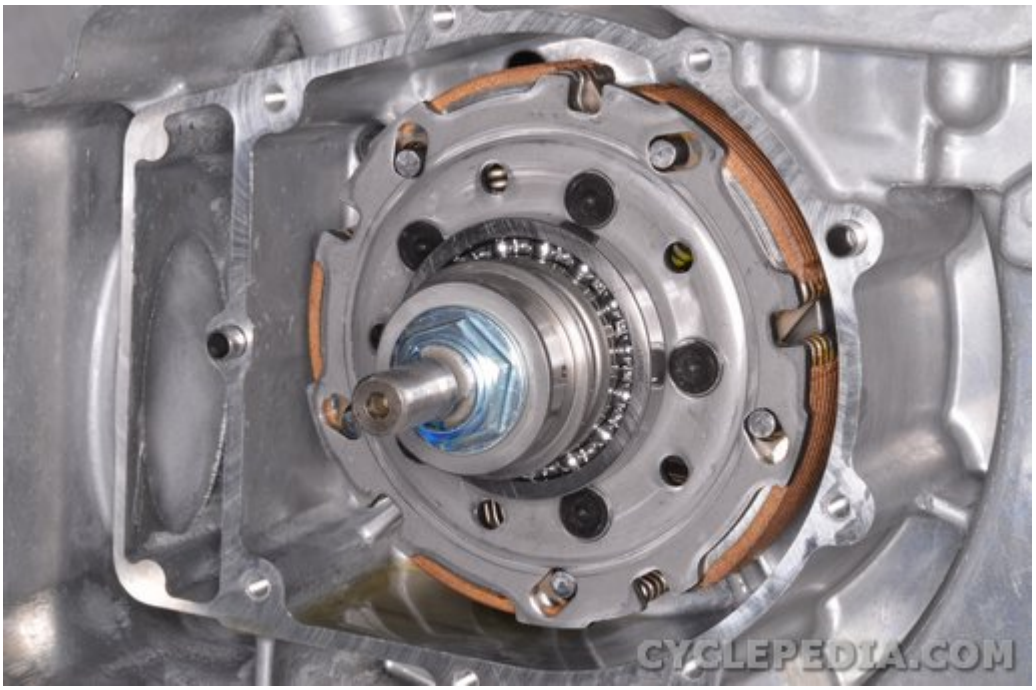


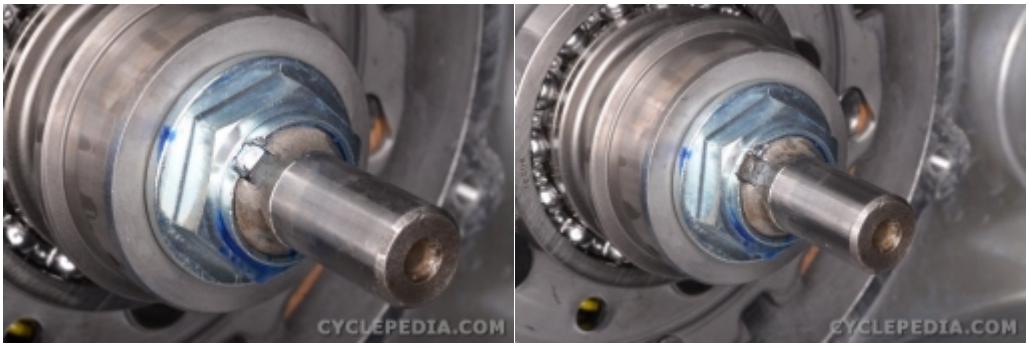
Remove the clutch cover bolts.



Remove the clutch cover assembly evenly.

Remove the two dowel pins and the clutch cover gasket.





Free the stake on the clutch nut with a chisel and a hammer.

Hold the clutch with the Y-type holder and loosen the clutch nut with a commercially available 26 mm deep well socket.

Special Tool -
Y-Type Holder: A120E00056
Lock Nut Wrench: A120E00079

Remove the clutch nut.

Slide off the outer clutch collar.

Slide the clutch assembly off of the crankshaft.

Slide off the inner clutch collar.

Inspection

Remove the clutch outer and drive pulley shaft from the clutch cover.

To check the one-way clutch in the clutch outer temporarily install the clutch and set the clutch outer in place without the cover.

When turning the clutch outer clockwise, the clutch outer should turn freely. If not, the one-way clutch assembly is faulty and should be replaced.

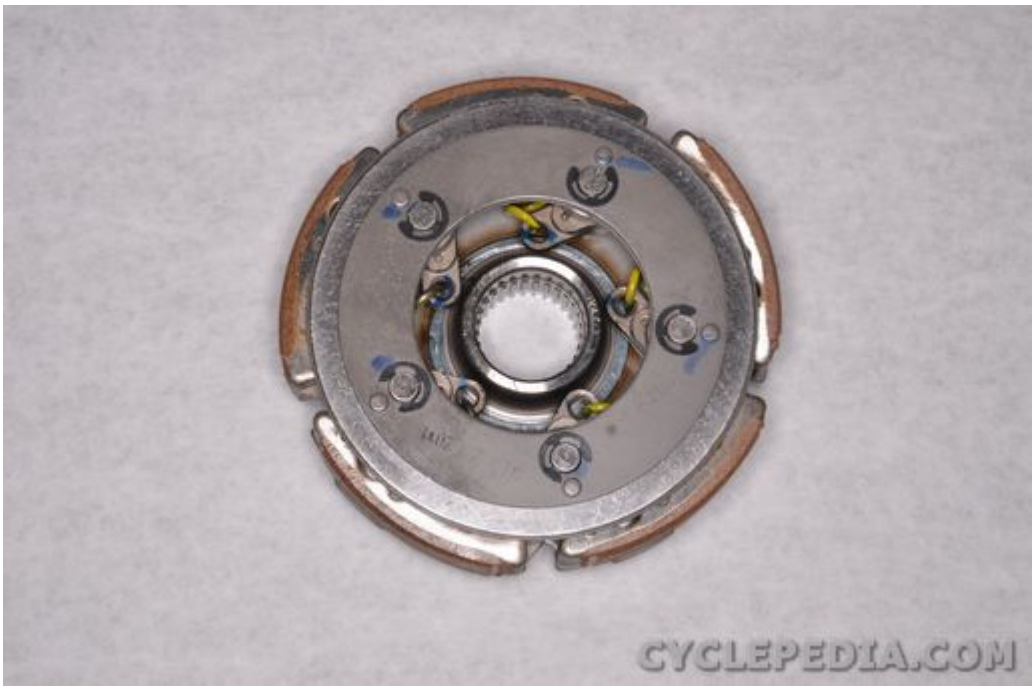
When turning the clutch outer counterclockwise, the clutch outer and crankshaft should engaged by the one-way clutch. If not, the one-way clutch assembly is faulty and should be replaced.

Remove the one-way clutch and replace it as needed.

Install the clutch outer to the crankshaft with without the clutch and collars. When turning the clutch outer clockwise or counterclockwise, the clutch outer should turn smoothly. If not, the needle bearing or the clutch outer is damaged. Inspect these components.

Inspect the inside of the clutch outer and needle bearing for wear and damage. Replace the components as needed.

If the needle bearing is in poor condition remove the snap ring and replace the bearing. Press in a new bearing and secure it with a new snap ring. Make sure the snap ring is secure in its groove.



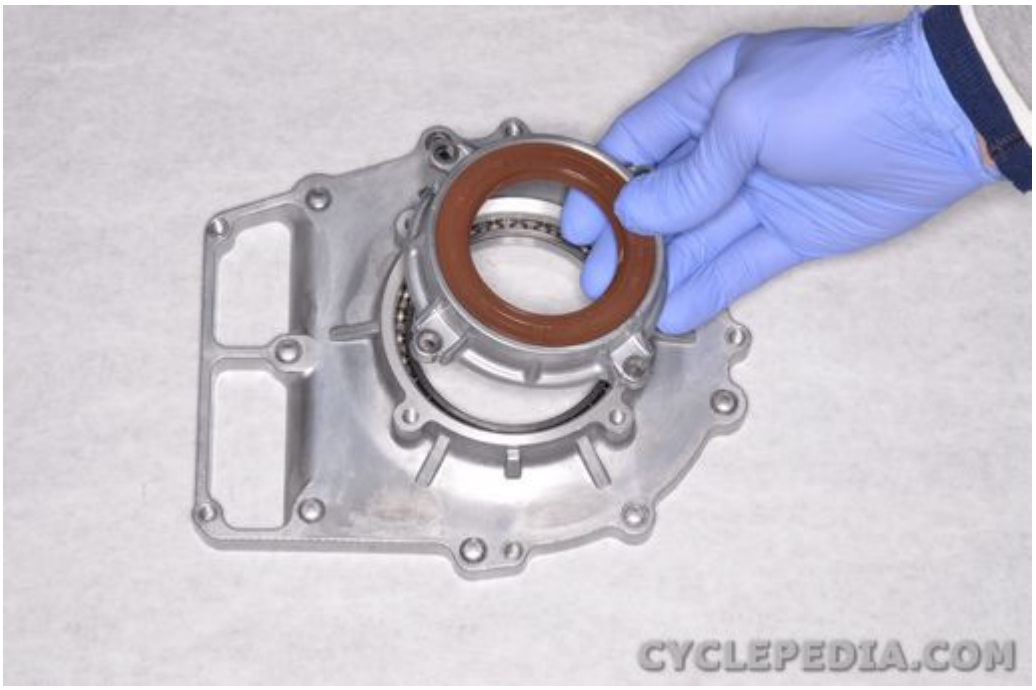
Check the clutch linings for abnormal wear and damage.

Replace the clutch if the lining thickness is below 1 mm (0.04 in).

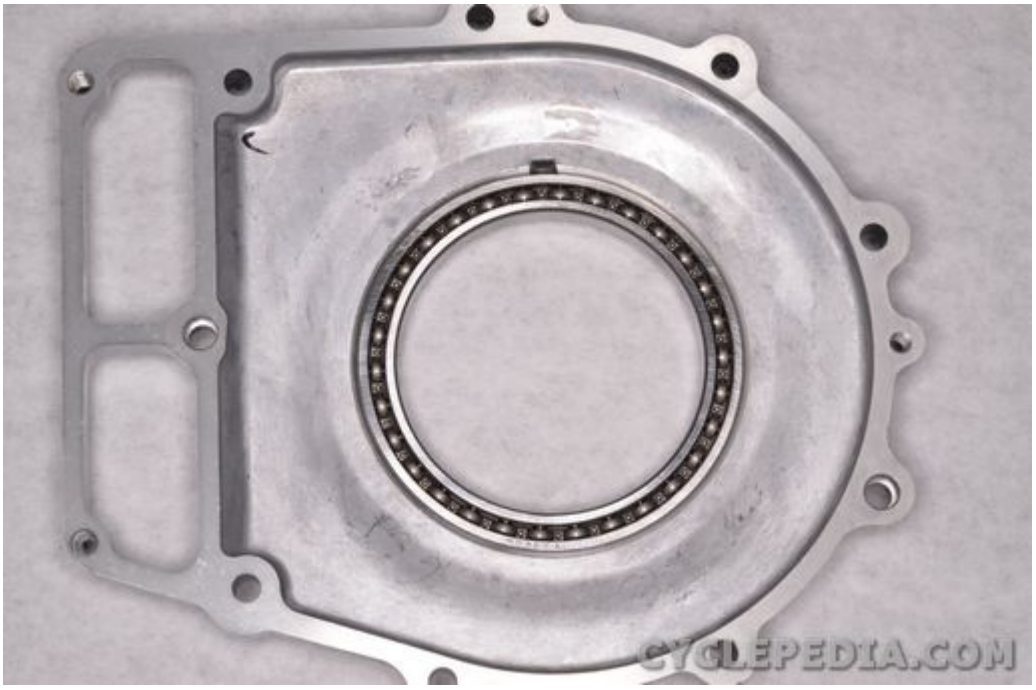
Inspect the clutch bearing by turning it with a finger. Replace the bearing if it doesn't turn smoothly or it has excessive play.

Inspect the clutch cover oil seal and replace it as needed.

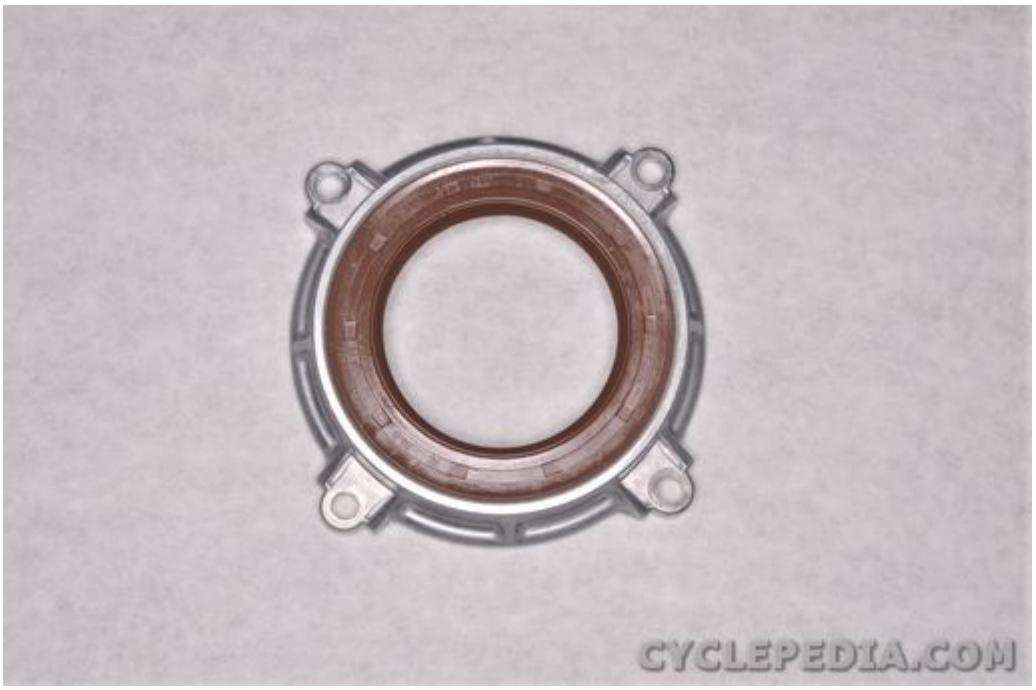
Inspect the large ball bearing in the clutch cover. Turn the bearing with a finger. Replace the bearing if it doesn't turn smoothly. Remove the seal cover to replace the bearing.



Remove the four seal cover bolts with an 8 mm socket. Take off the seal cover and discard the gasket.



Drive the bearing out from the outside of the clutch cover. Drive in the new bearing from the inside of the clutch cover. Use a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out.



Press a new seal into the seal cover. Use a suitable driver that is the same outside diameter as the seal.

Apply a light coat lightweight lithium-soap based grease to the lips of the oil seal.

For clutch assembly and installation see the Clutch Installation topic for more information.

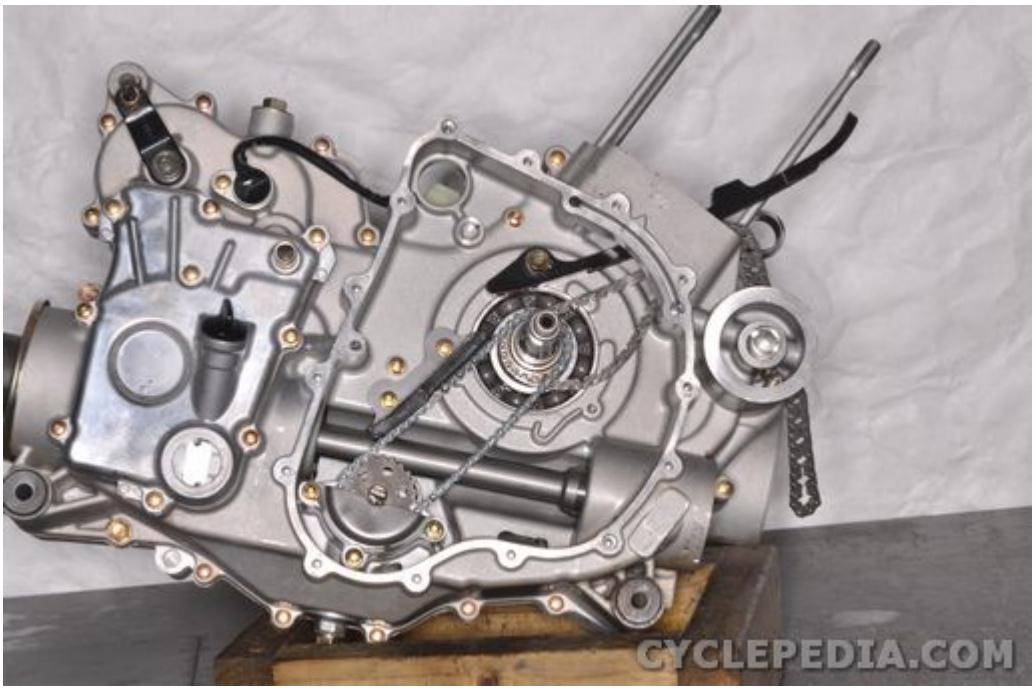
Install the CVT belt case cover. See the Belt Case Cover topic for more information.

Oil Pump

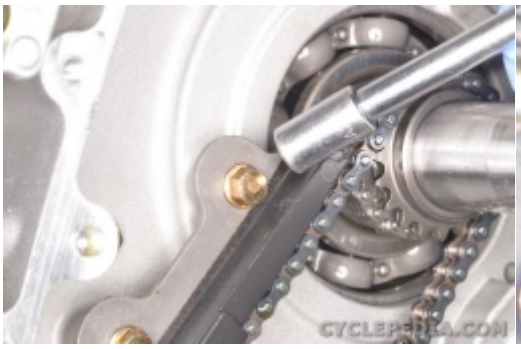
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Side covers	Side Covers
Mudguard	Mudguards and Footrests
Drain the engine oil	Engine Oil
Drain the coolant	Coolant
Water pump cover	Water Pump
Generator cover	Generator Cover
Generator flywheel	Flywheel



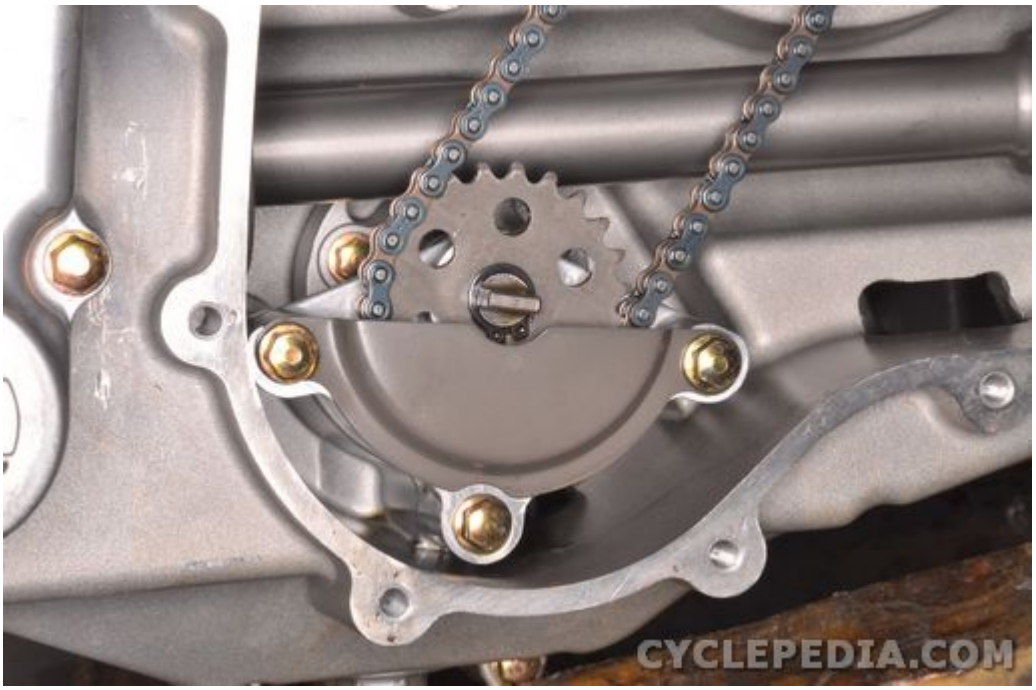
The oil pump is gear is driven by a chain from the crankshaft.



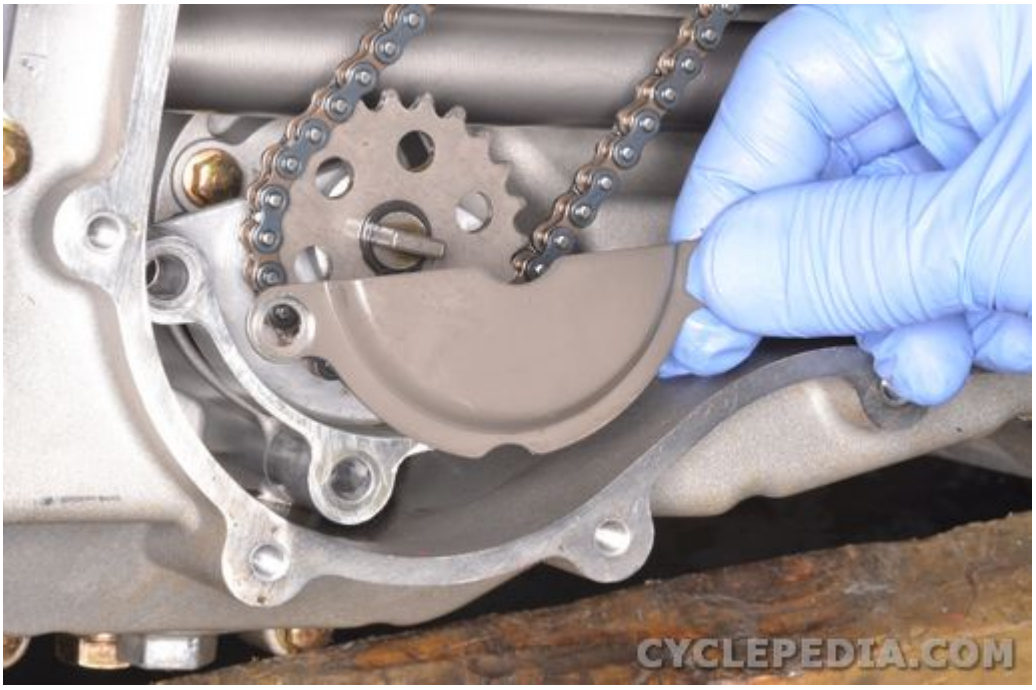
Remove the two oil pump chain guide bolts.

Remove the oil pump chain guide.

Inspect the chain guide for wear and damage.

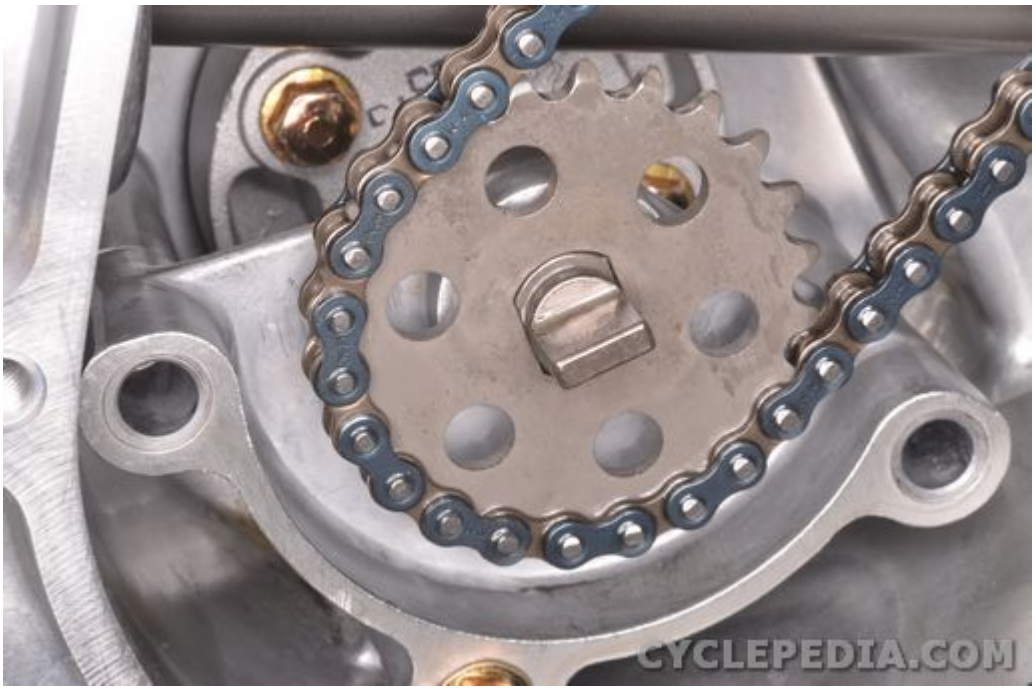


Remove the three oil pump cover bolts with an 8 mm socket.



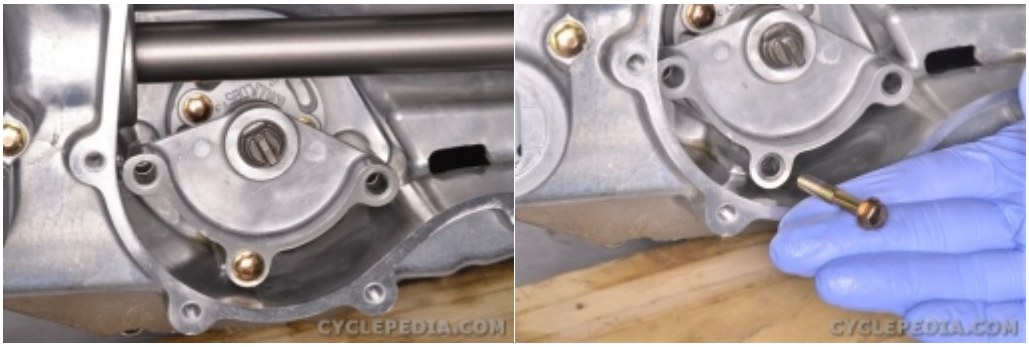
Remove the oil pump cover.

Remove the snap ring with snap ring pliers.



Slide the oil pump sprocket off of the oil pump shaft.

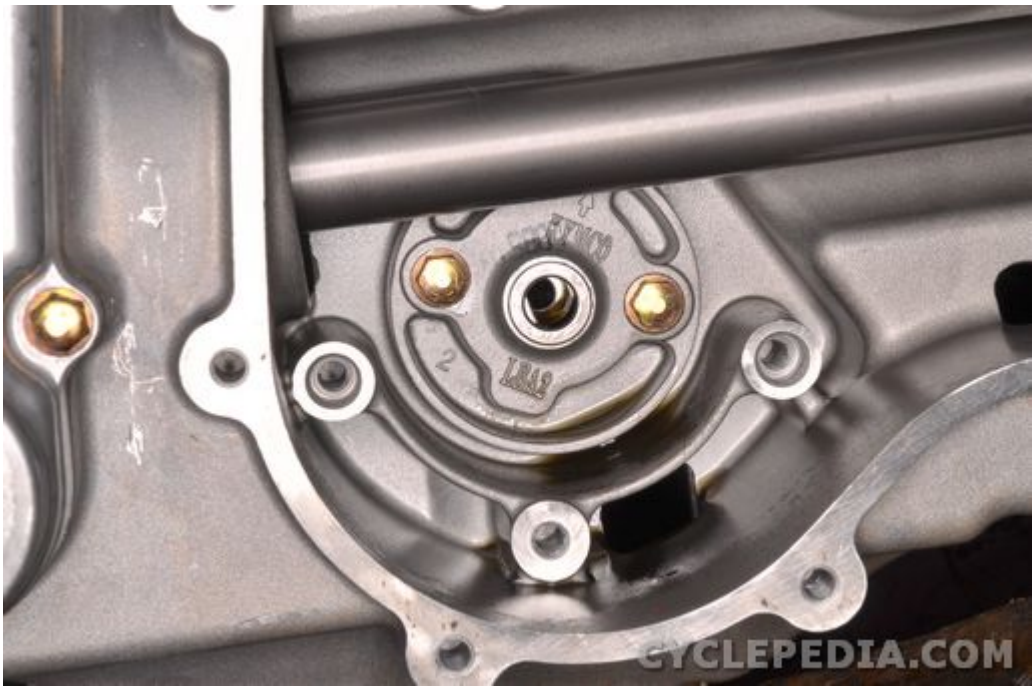
Free the oil pump chain from the crankshaft and remove the oil pump sprocket and chain.

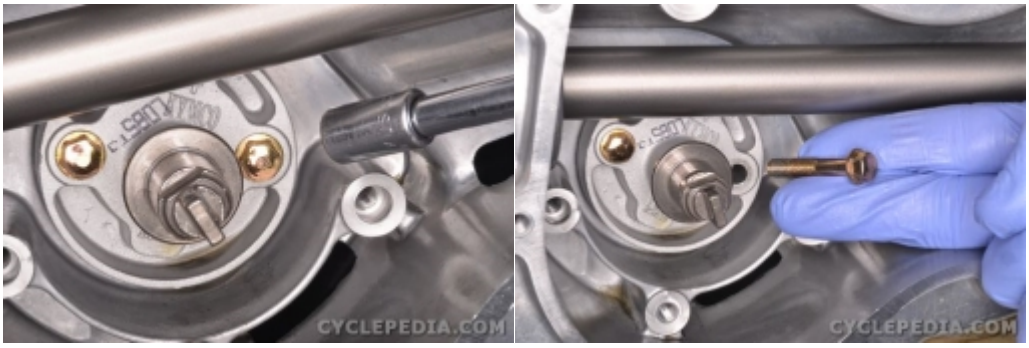


Remove the oil pump shaft holder bolt with an 8 mm socket.

Remove the oil pump shaft holder.

Remove the two oil pump shaft holder dowel pins.





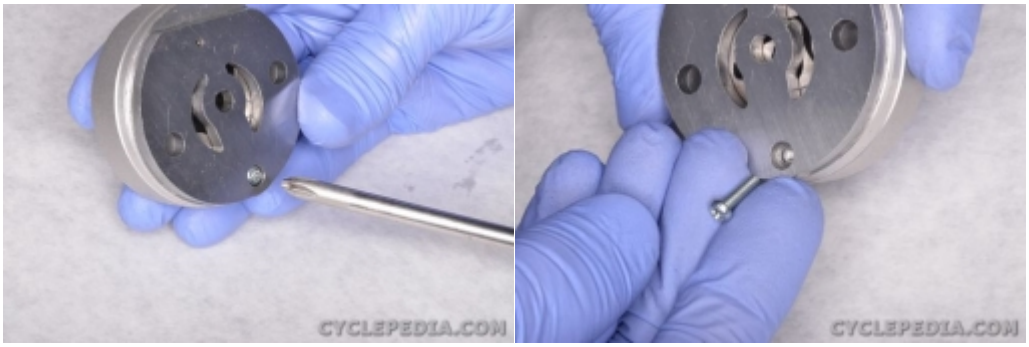
Remove the two oil pump bolts with an 8 mm socket.

Remove the oil pump. Turn the oil pump shaft and make sure it turns smoothly.

Remove the oil pump gasket.

Disassembly

Slide the oil pump shaft out of the oil pump.



Remove the oil pump cover screw.

Remove the oil pump cover.

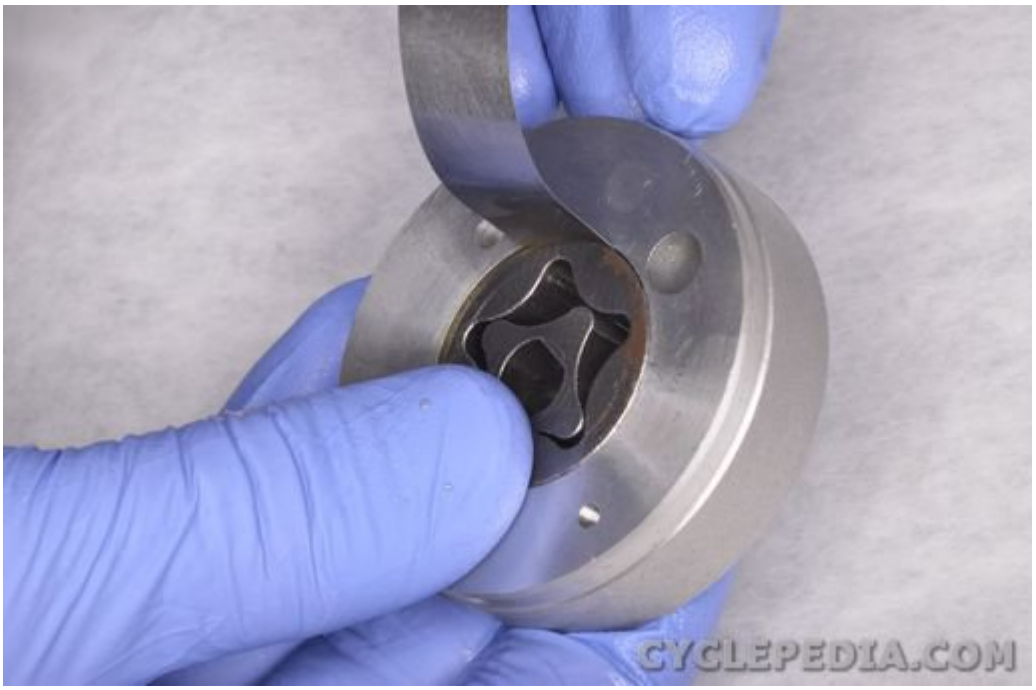
Remove the oil pump dowel pin.

Remove the inner and outer oil pump rotors.

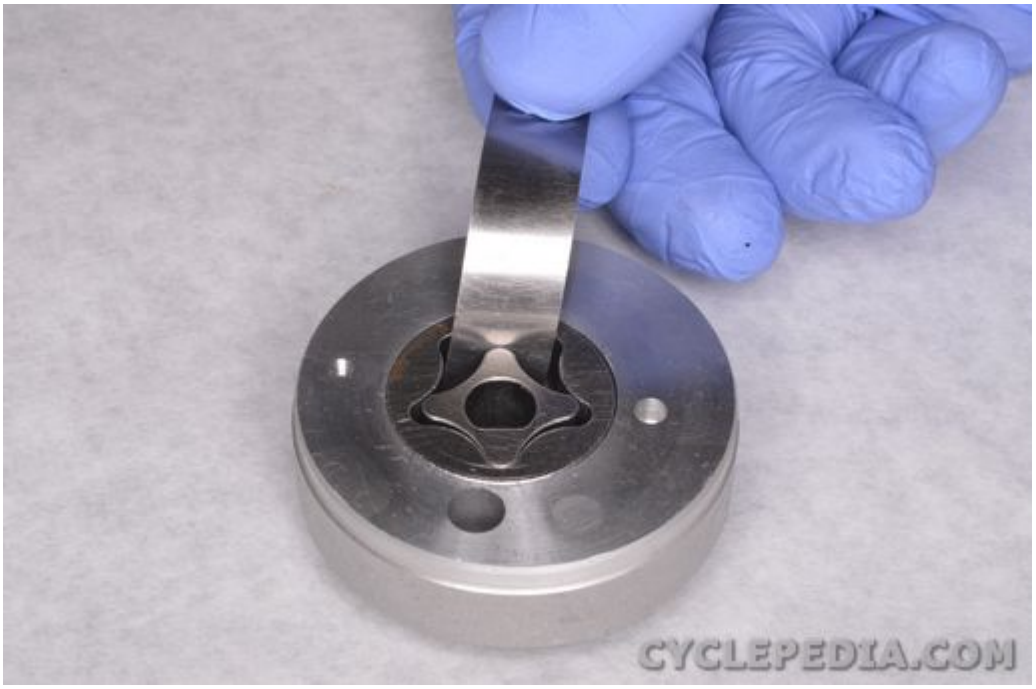
Inspection

Check the oil pump chain guide for signs of excessive wear and damage. Replace it as needed.

Inspect the oil pump chain and sprocket for excessive wear and damage. Replace these components as needed.



Use a feeler gauge set to check the clearance between the outer oil pump rotor and the body (body clearance).



Use a feeler gauge set to check the clearance between the inner and outer rotors (tip clearance).

Place a straight edge across the oil pump body and rotors. Check the side clearance with a feeler gauge.

ITEM		STANDARD mm (in)	SERVICE LIMIT
Oil pump rotor	Tip clearance	0.15 (0.006) max	0.2 (0.008)
	Body clearance	0.15 - 0.2 (0.006 - 0.008)	0.25 (0.01)
	Side clearance	0.04 - 0.09 (0.0016 - 0.0036)	0.12 (0.0048)

Replace the oil pump if the oil pump rotors are damaged or the measurements are out of specification.

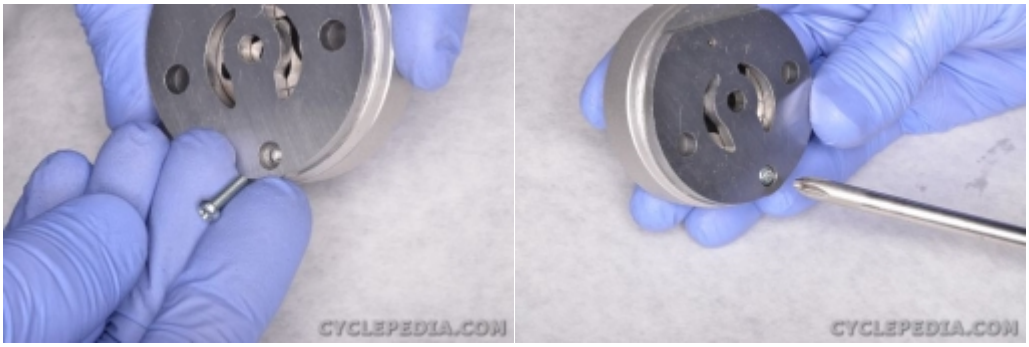
Assembly

Lubricate the rotating parts in fresh engine oil.

Fit the outer and inner rotors into the oil pump body.

Install the oil pump dowel pin.

Install the oil pump cover.



Install the oil pump cover screw and tighten it to specification with a #2 Phillips screwdriver.

ITEM	N-m	kgf-m	ft-lb
Oil pump screw	3	0.3	2

Slide the oil pump shaft into the oil pump.

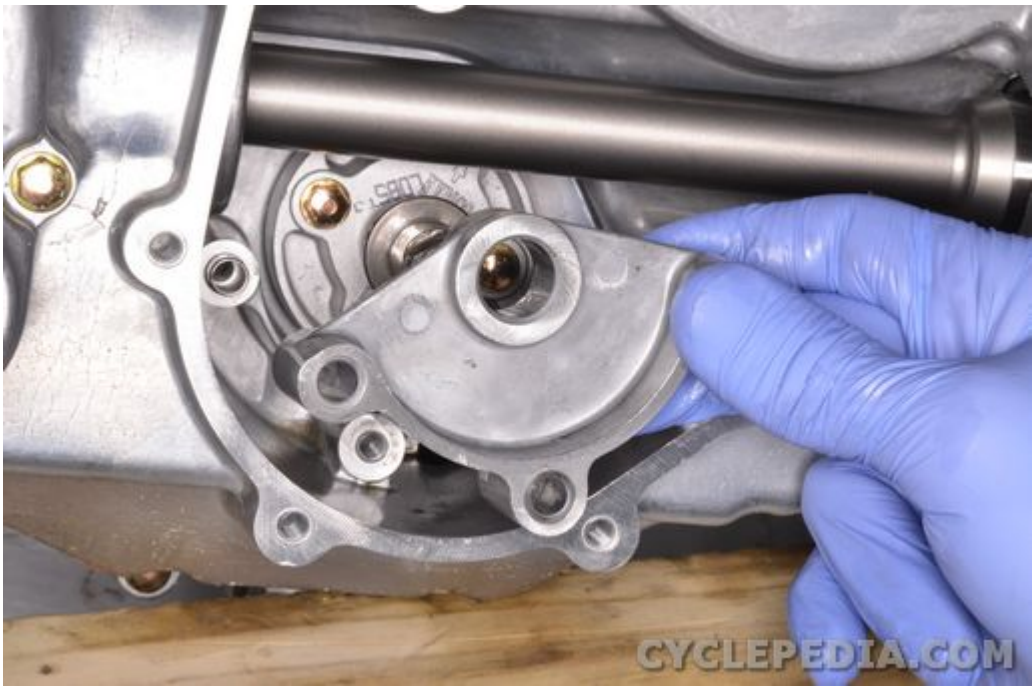
Installation

Fit the oil pump into place with the arrow pointing up.

Insert the two oil pump mounting bolts and tighten them securely

Turn the oil pump shaft and make sure it turns smoothly.

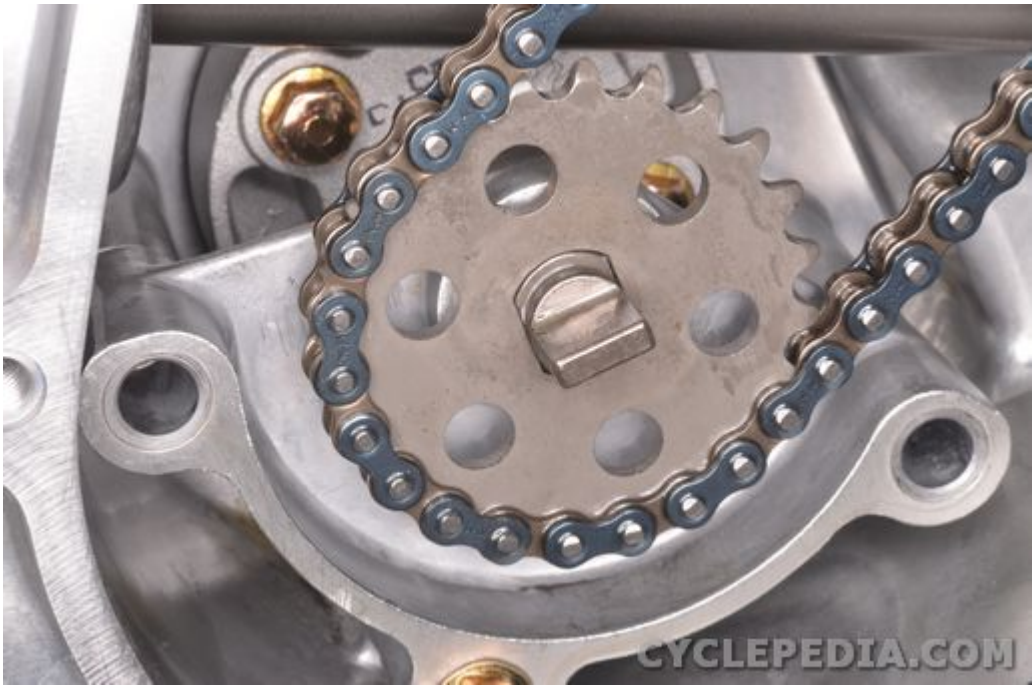
Install the two oil pump shaft holder dowel pins.



Fit the oil pump shaft holder into place.

Install the oil pump shaft holder bolt. Do not tighten, yet.

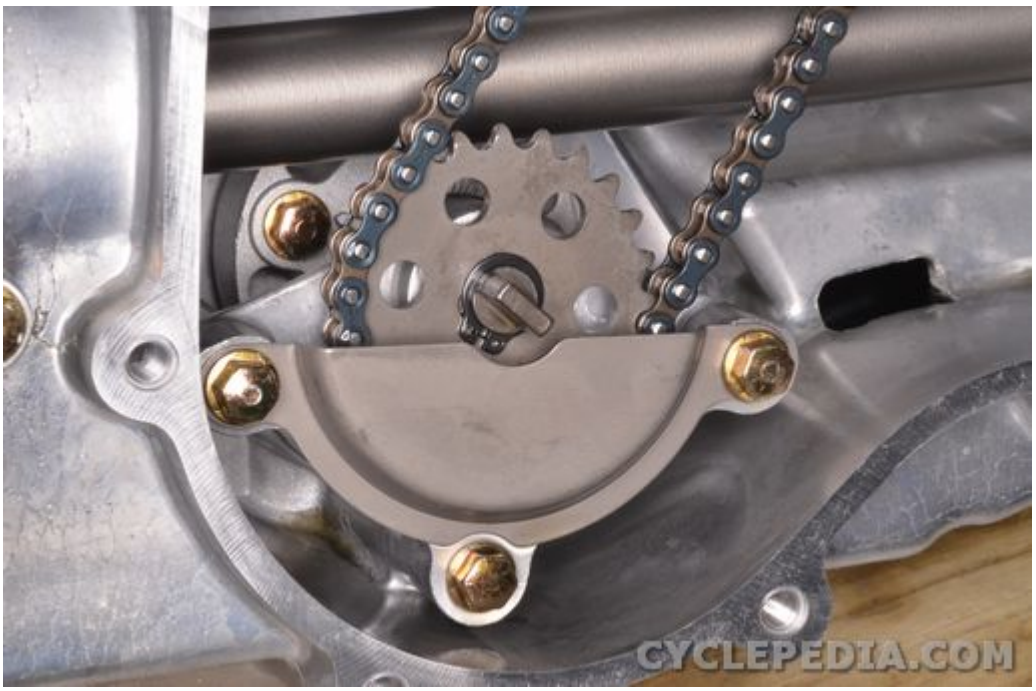
Fit the oil pump sprocket and chain into place. Engage the chain to its drive sprocket on the crankshaft.



Fit the oil pump sprocket onto the oil pump shaft.

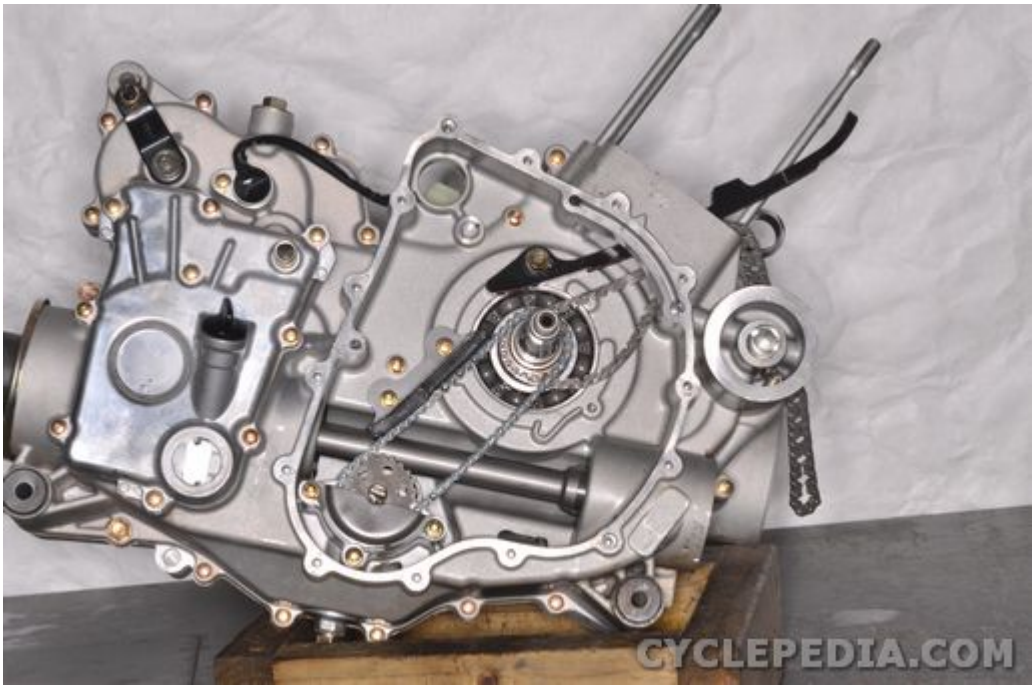
Install the new snap ring with snap ring pliers.

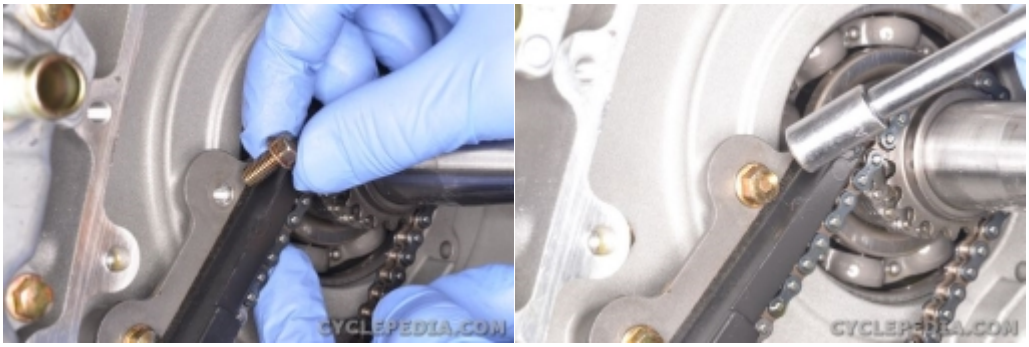
Install the oil separator and the two mounting bolts.



Tighten the oil pump holder shaft bolt and two oil separator mounting bolts securely with an 8 mm socket. Tighten the bolts evenly in a crisscross pattern.

Fit the oil pump chain guide into place.





Install the two oil pump chain guide bolts and tighten them securely with an 8 mm socket.

Install these components	
Component	Topic
Generator flywheel	Flywheel
Generator cover	Generator Cover
Water pump cover	Water Pump
Drain the coolant	Coolant
Drain the engine oil	Engine Oil
Mudguard	Mudguards and Footrests
Side covers	Side Covers

Crankcase

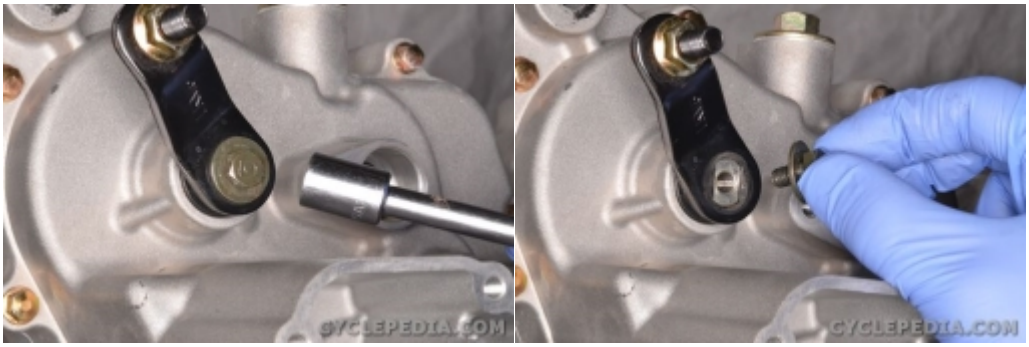
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Splitting

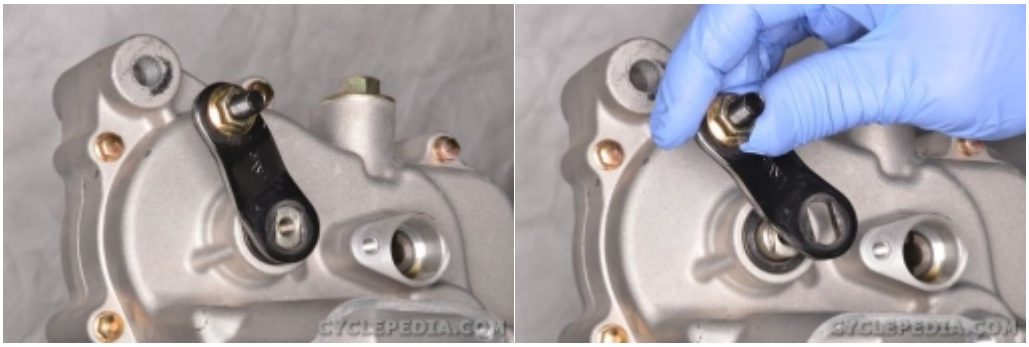
Remove these components	
Component	Topic
Engine from the frame	Engine Removal
Spark plug	Spark Plug
Starter motor	Starter Motor
Rocker cover	Rocker Cover
Camshaft	Camshaft
Exhaust system	Exhaust System
Drain the coolant	Coolant
Throttle body and intake pipe	Throttle Body Removal and Installation
Cylinder head	Cylinder Head
Cylinder and piston	Cylinder and Piston
CVT pulleys and belt case	CVT Removal
Clutch	Clutch Removal
Water pump	Water Pump
Generator cover	Generator Cover
Generator flywheel	Flywheel
Oil pump	Oil Pump
Cam chain	Cam Chain

Remove the gear position indicator switch bolt with an 8 mm socket.

Remove the gear position indicator switch. Note its position so that it can be returned to its original orientation.



Remove the shift arm bolt with a 10 mm socket.

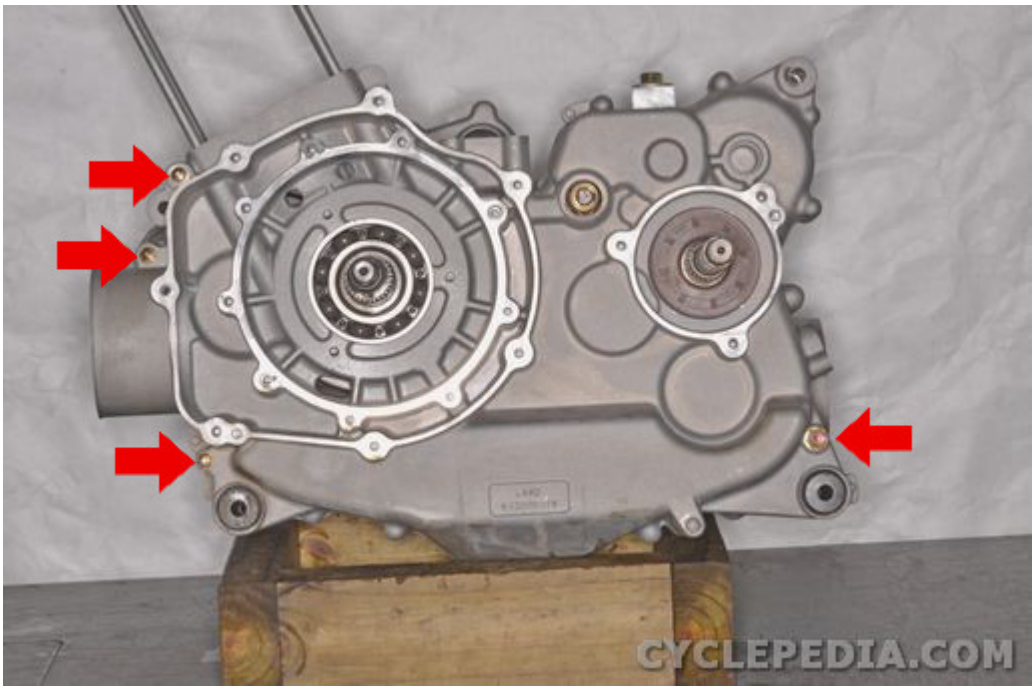


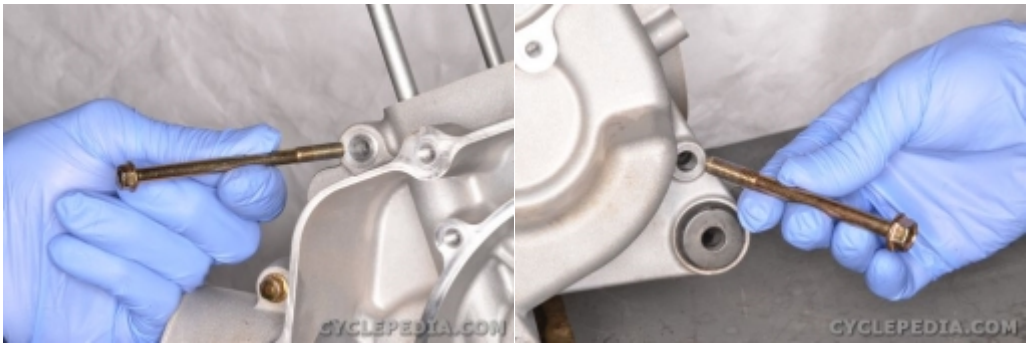
Remove the shift arm from the shift shaft.

Loosen the shift cam stopper plug with a 14 mm socket.

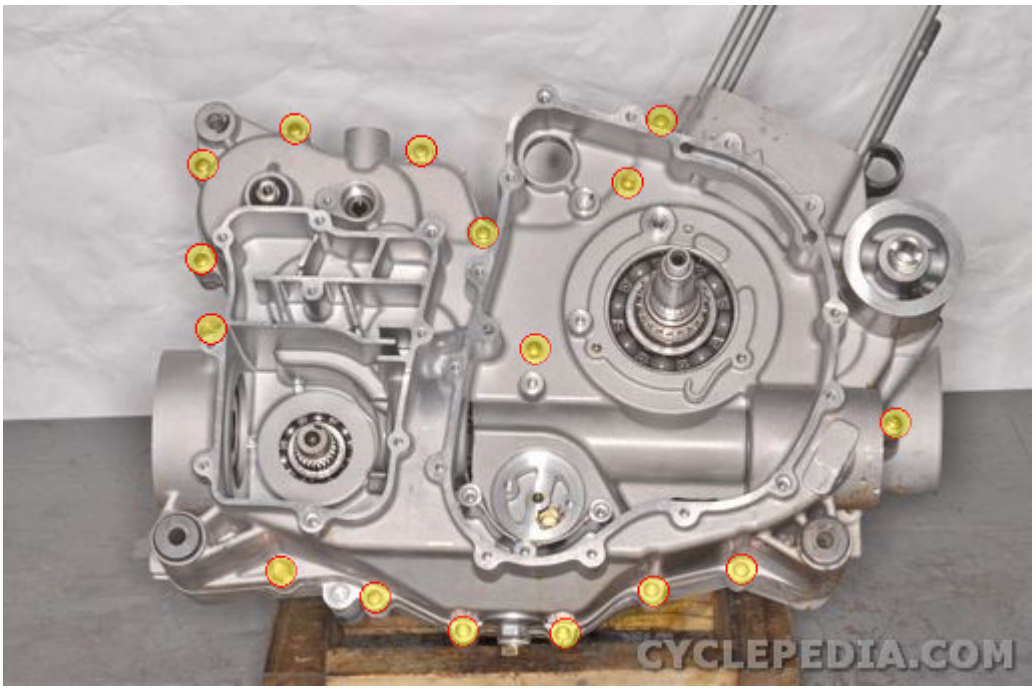
Remove the stopper plug, washer, spring, and stopper ball.

Inspect the shift cam stopper components and replace them as needed.





Remove the four bolts from the CVT side of the crankcase with an 8 and 12 mm socket.

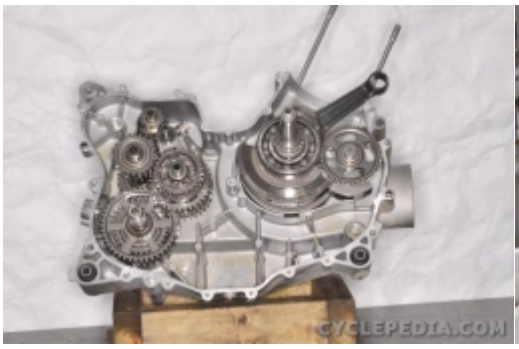


Loosen the generator side crankcase bolts evenly and in a crisscross pattern.

Remove the generator side crankcase bolts with an 8 mm and 12 mm socket.

Utilize the pry points to separate the halves of the crankcases. Do not place a screwdriver or pry bar against the mating surfaces of the crankcases.

Lift the generator half of the crankcase off the CVT side of the crankcase.



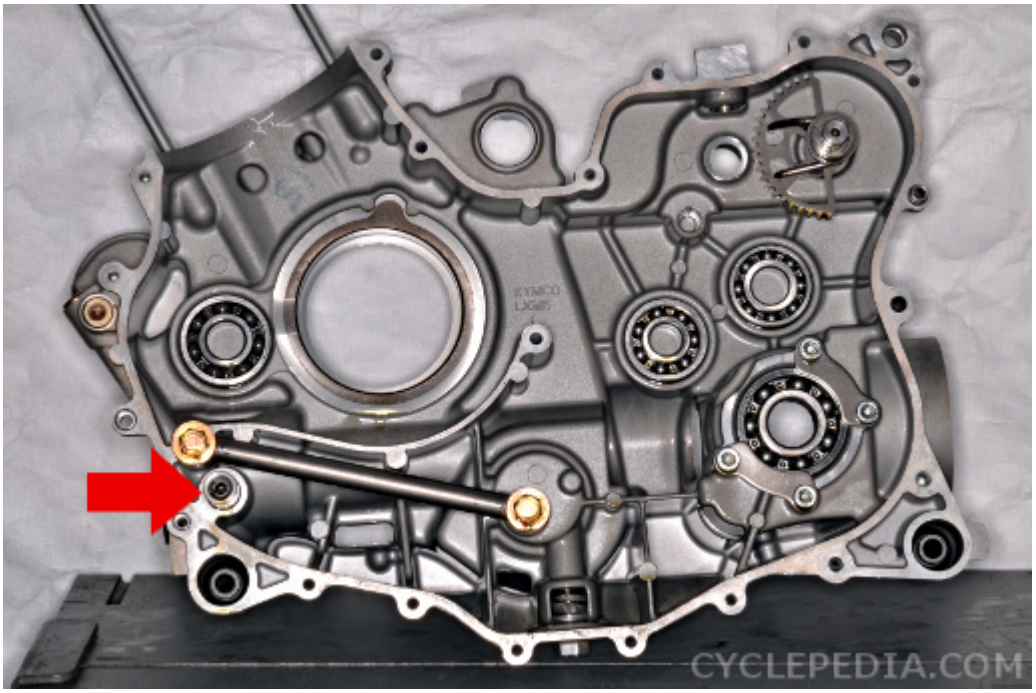
Remove the two dowel pins from the crankcase. Remove the old crankcase gasket material.

To remove the crankshaft and balancer see the Crankshaft topic.

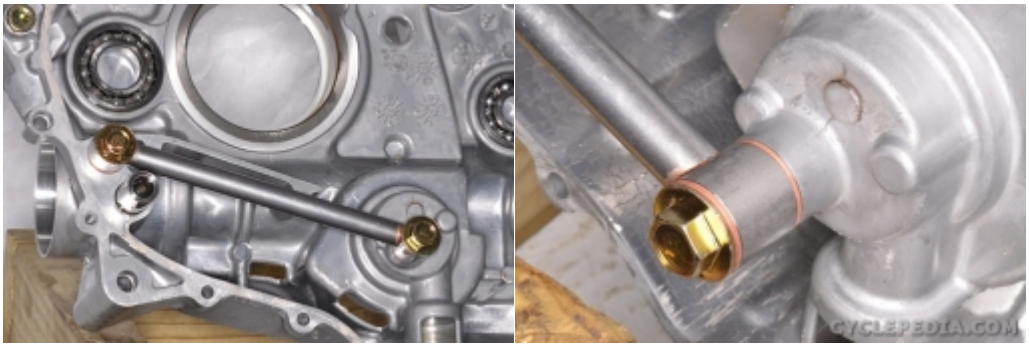
To remove the transmission see the Transmission Removal topic.

To inspect and replace the crankcase bearings see the Crankcase Bearings topic for more information.

Oil Relief Valve and Oil Pipe



The oil relief valve is located in the crankcase.



If it is necessary, remove the oil pipe; Remove the two bolts, washers (on the oil pipe), oil pipe and washers (under oil pipe).

Remove the oil relief valve from the crankcase.

Push in on the oil relief valve piston and make sure it moves smoothly. Replace it if it sticks or refuses to move.

Discard the O-ring and replace it with a new item. Apply fresh engine oil to the new O-ring.

Fit the oil relief valve into place in the crankcase.

Assembly

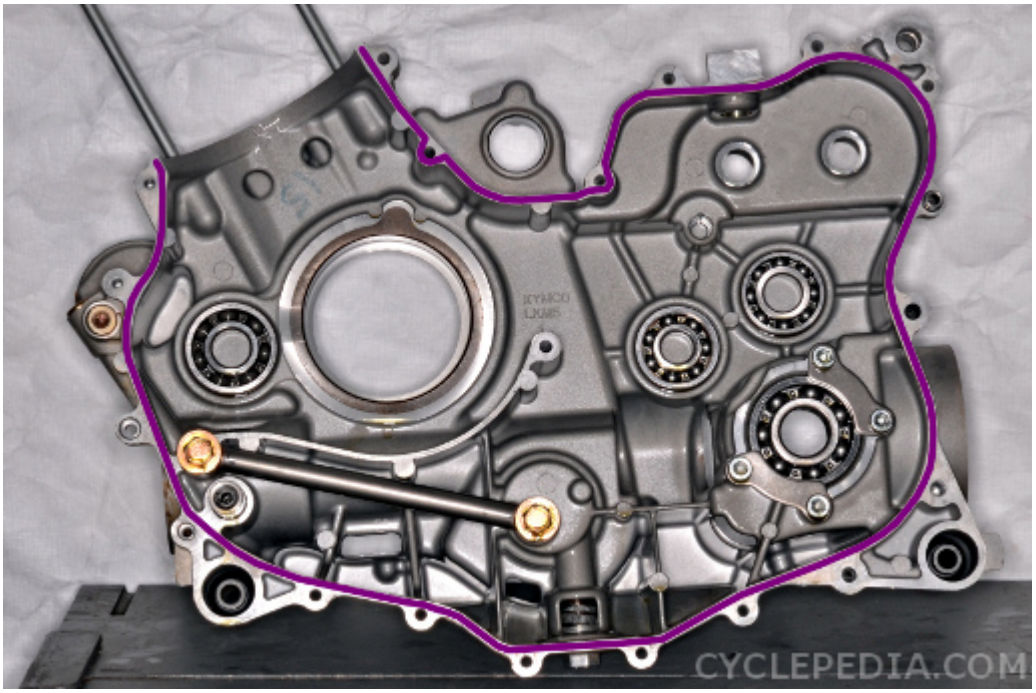
Make sure the crankcase mating surfaces are clean.

Install the inner washers on the right crankcase. Install the oil pipe with the thick side face upward. Apply clean engine oil to the bolts, then install the outer washers and two bolts. Tighten the two bolts to the specified torque.

ITEM	N-m	kgf-m	ft-lb
Oil pipe bolt	35	3.5	25.2

The crank, balancer, and the transmission assembly should be installed in the left crankcase half.

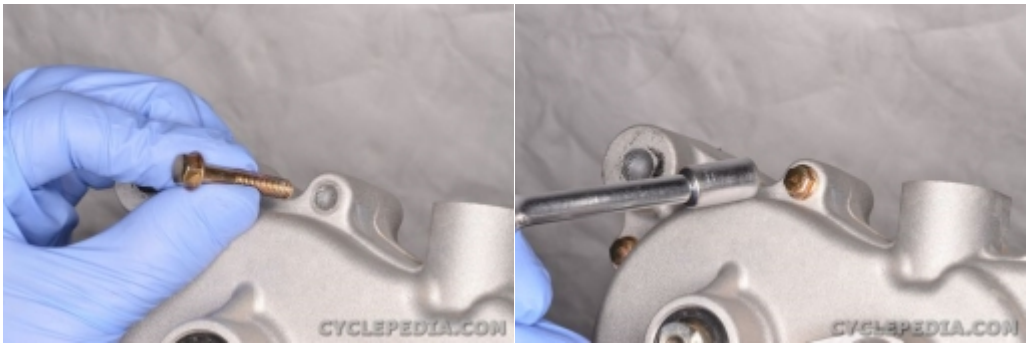
Install the two dowel pins into the left crankcase half.



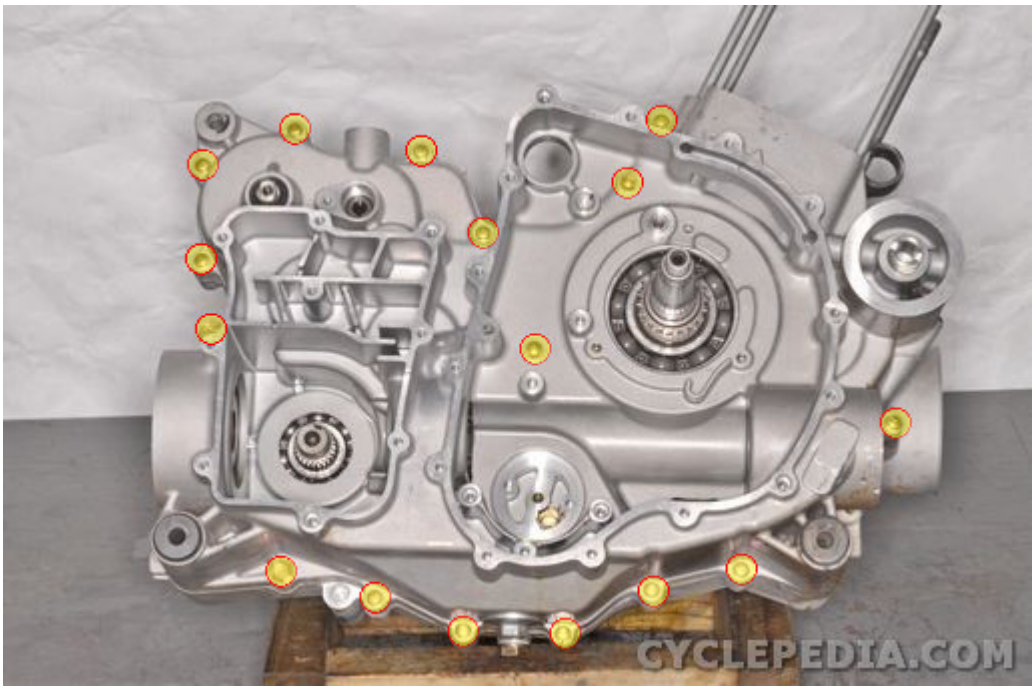
Apply Threebond 1215 or other equivalent sealant to the crankcase mating surface. Do not allow the sealant to get into oil passages or bearings.

The crankcases must be joined in a few minutes or the sealant will not function correctly.

Fit the generator side crankcase half onto the CVT crankcase half. Make sure the shafts line up correctly. Watch the shift shaft and make sure it doesn't push out or roll up its oil seal when the cases are joined.

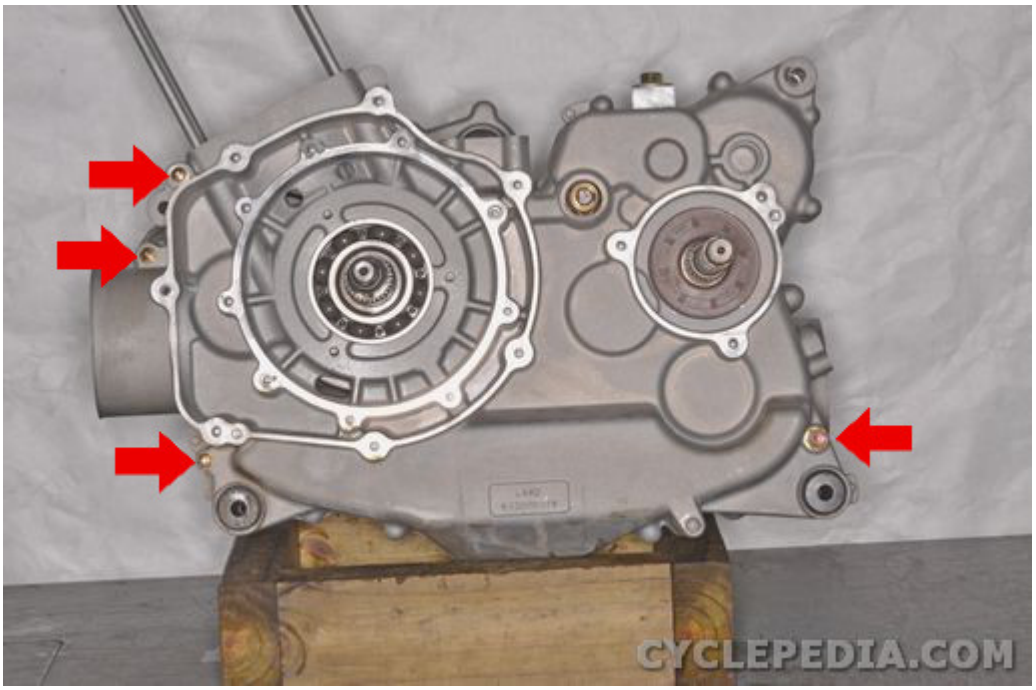


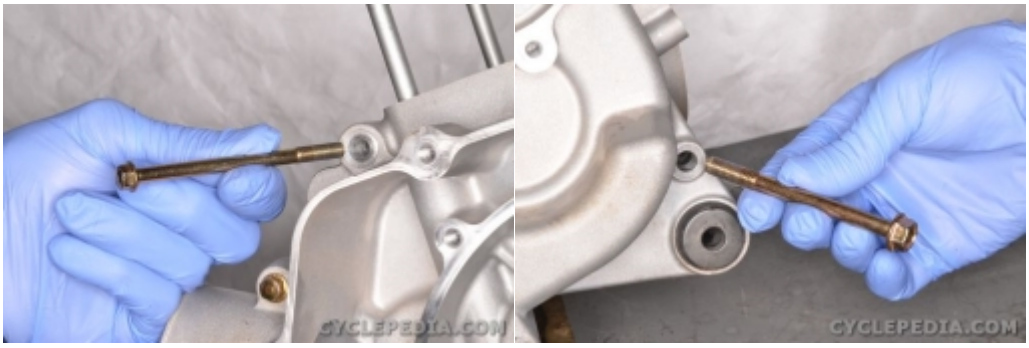
Lubricate the threads of the crankcase bolts with oil. Insert the generator side crankcase bolts. Tighten the bolts evenly and in a crisscross pattern.



Torque the generator side crankcase bolts to specification with an 8 mm and 12 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
		N-m	ft-lb	
CRANKCASE SET	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M8 x 1.0	24.5	18	APPLY OIL





Install the four crankcase bolts into the CVT side of the crankcase with an 8 and 12 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
		N-m	ft-lb	
CRANKCASE SET	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M6 x 1.0	11.8	8.7	APPLY OIL
	M8 x 1.0	24.5	18	APPLY OIL

Use a new sealing washer with the shift cam stopper plug.

Install the stopper plug, washer, spring, and stopper ball.

Tighten the stopper plug to specification with a 14 mm socket.

ITEM	N-m	kgf-m	ft-lb
Shift cam stopper plug	48	4.8	35

Install the shift arm to the shift shaft.

Install the shaft arm bolt and tighten it securely with a 10 mm socket.

Install a new O-ring to the gear position indicator switch if needed. Lubricate the O-ring with fresh engine oil. Install the gear position indicator switch.

Install the gear position indicator switch bolt and tighten it securely with an 8 mm socket.

Install the remaining engine components and return the engine to the frame. See the Engine Installation topic for more information.

Crankcase Bearings

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

Inspect the crankcase bearings.

Turn the bearings with a finger. They should turn freely with out noise or binding, but also without excessive play. Make sure the outer races of the bearings are secure in the crankcase.

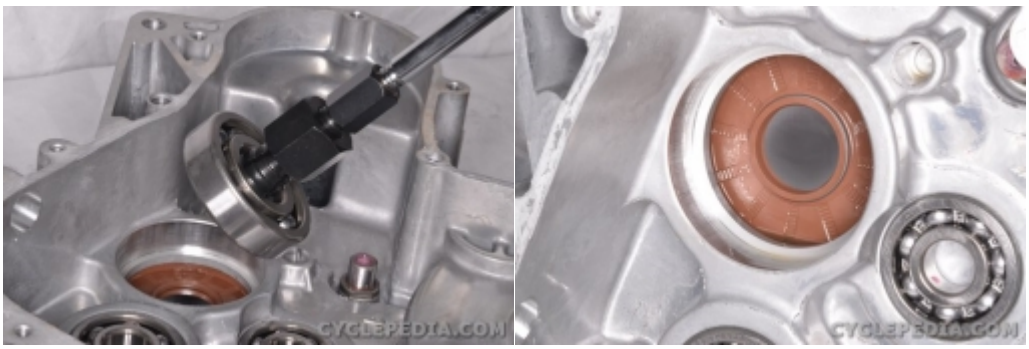
Replacement

Place the new bearing in the freezer at least a half hour before you plan to install them.

Remove the bearings with a suitable bearing puller.

Special Tool - Bearing Puller: A120E00037

To replace the drive shaft bearing first remove the set plates. Remove the set plate bolts with a 6 mm Allen. Install the bearing set plates after the bearing has been replaced and tighten new bolts securely with a 6 mm Allen.



Replace the oil seal if its bearing is to be replaced.

Drive in the new bearings with a suitable bearing driver that has the same outside diameter of the bearing. The manufactures markings on the bearing must face out.

Special Tool - Bearing Driver: A120E00014

Crankshaft

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Split the crankcases. See the crankcase Crankcase topic for more information.

Remove the transmission. See the Transmission Removal topic for more information.

Remove the crankshaft and balancer shaft together.

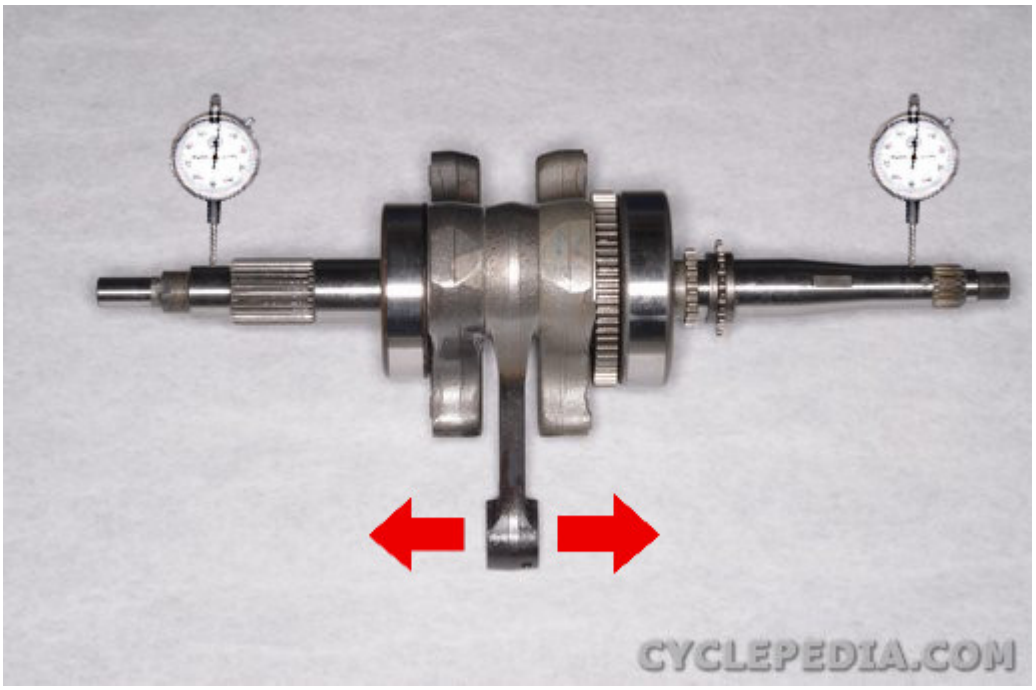
Inspection

Inspect the balancer shaft for wear and damage.

Inspect the crankshaft for wear or damage. Turn the crank bearings with a finger and make sure they turn smoothly. Replace the crankshaft if the bearings are faulty.

Measure the inside diameter of the small end of the connecting rod.

Item	Standard mm (in)	Service Limit
Connecting rod small end I.D. bore	22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

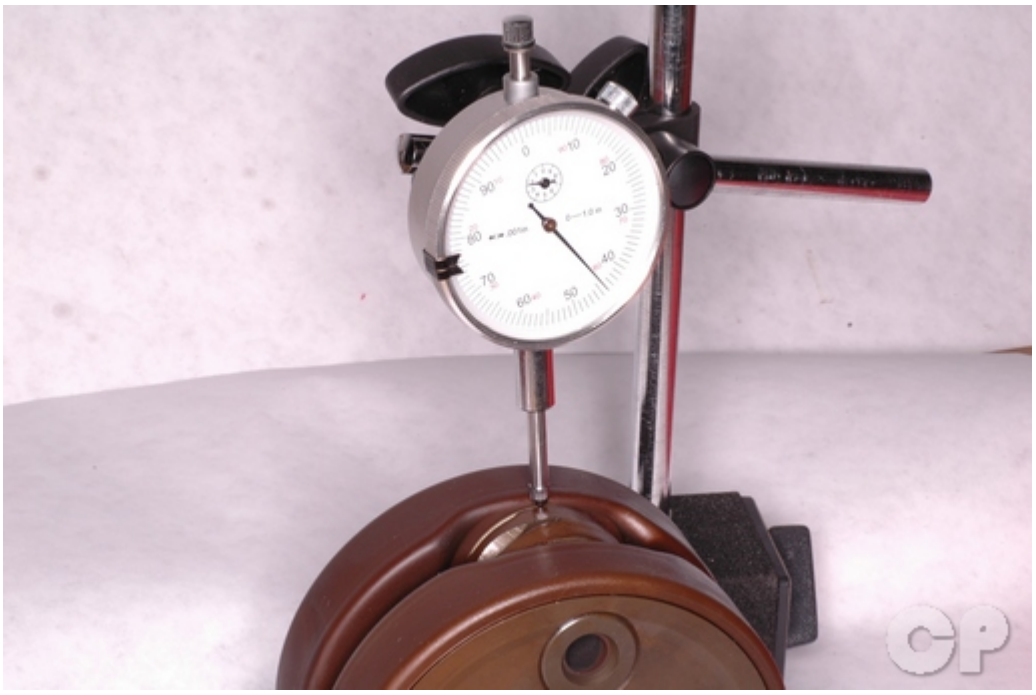


Place the crankshaft on V-blocks and measure the runout on each side with a dial gauge. Check the side to side movement of the small end of the connecting rod. Replace the crankshaft if it is out of specification.

Item	Standard mm (in)	Service Limit
Connecting rod small end free play	0.8 - 1(0.032 - 0.04)	-
Runout	-	0.1 (0.004)

Check the side clearance of the big end of the connecting rod with a feeler gauge.

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)



Inspect the radial clearance of the big end of the connecting rod with a dial gauge.

Item	Standard mm (in)	Service Limit
Connecting rod big end radial clearance	0 - 0.008 (0 - 0.00032)	0.05 (0.002)

Installation

Lubricate the crankshaft and balancer bearings with fresh engine oil.

Fit the crank and balancer shafts into the crankcase together.

The line on the balancer sprocket must align with the line on the crankshaft.

Install the transmission. See the Transmission Installation topic for more information.

Assemble the crankcases. See the Crankcase topic for more information.

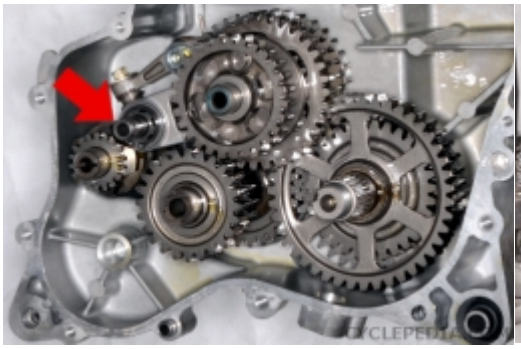
Transmission Removal

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Remove the engine. See the Engine Removal topic for more information.

Split the crankcases. See the Crankcase topic for more information.

Remove the shift shaft.



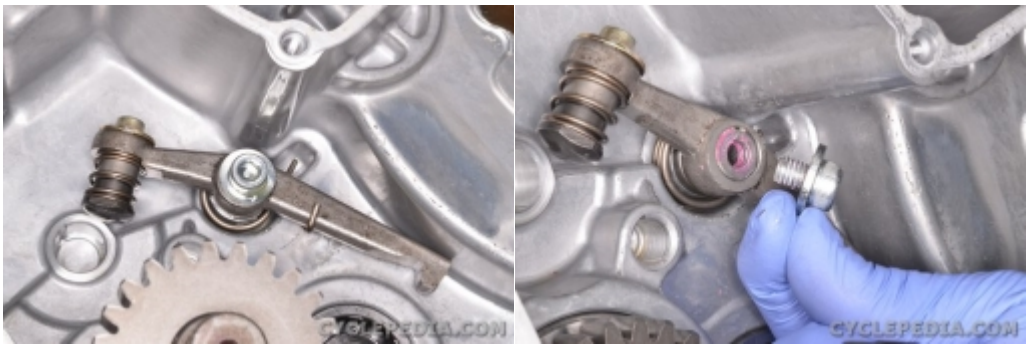
Remove the transmission guide bar.

Remove the upper and lower shift forks.

Remove the shift cam.

Remove the transmission shafts together from the crankcase.

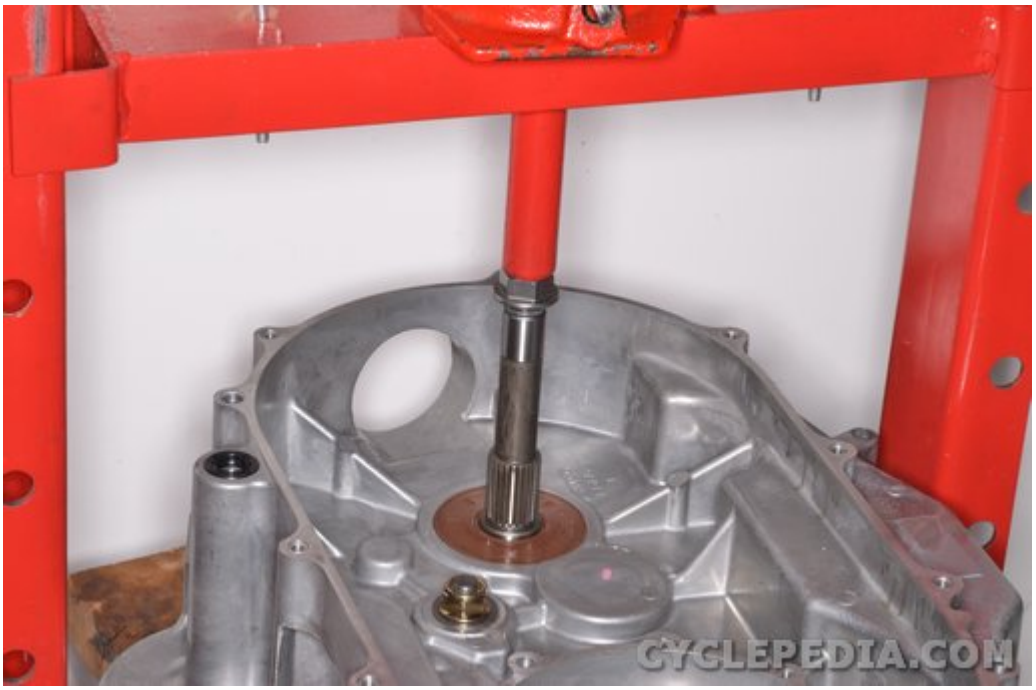
To disassemble the transmission shafts see the Transmission Shafts topic for more information.



Remove the stopper lever bolt and washer with a 6 mm Allen wrench.

Remove the stopper lever and spring.

Remove the crankshaft and balancer shaft together. See the Crankshaft for more information.



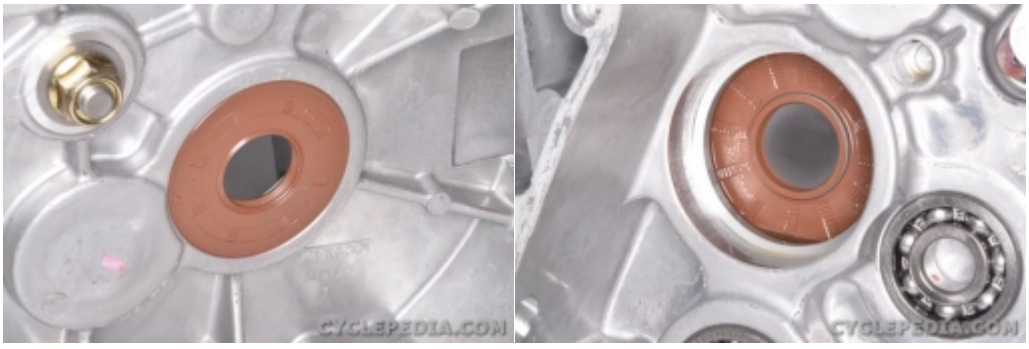
Place the nut that was removed from the driven pulley back onto the shaft to protect the threads and begin to press the shaft out. Remove the nut before it reaches the oil seal as it will not fit through. Remove the shaft.

If the bearing comes out with the transmission drive shaft press it off as shown.

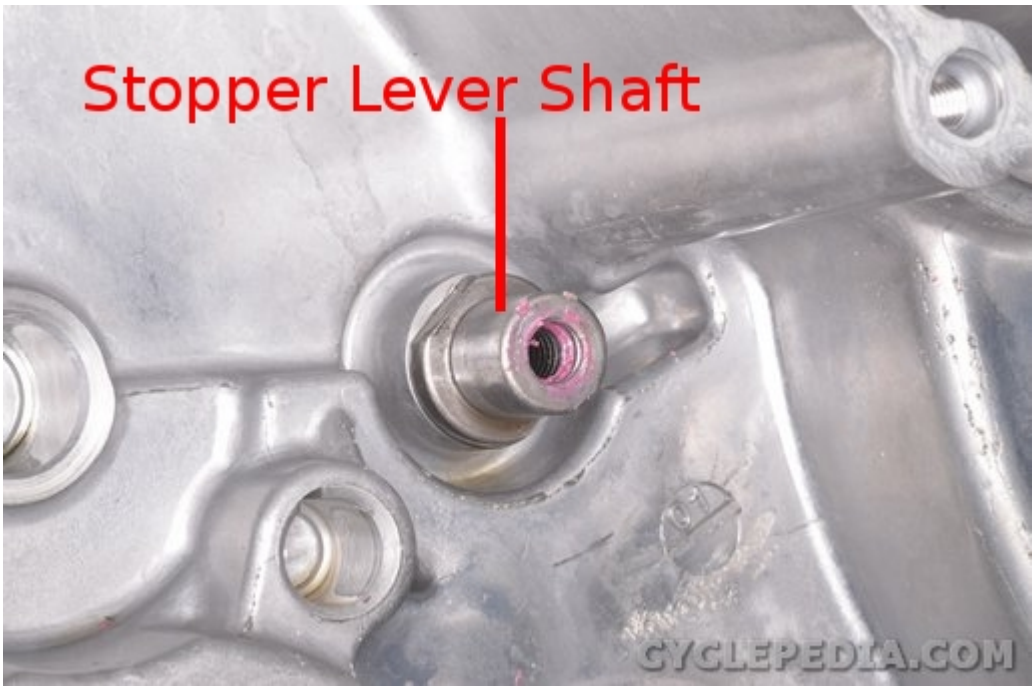
Note: Always replace the bearing if it is removed from the crankcase.

If the transmission drive shaft bearing does not come out with the shaft and needs to be replaced; remove it with a bearing puller. See the Crankcase Bearings topic for more information.

Note: Always replace the bearing if it is removed from the crankcase.



Inspect the transmission drive shaft oil seal and replace if needed.



If it is necessary to remove the stopper lever shaft use a 19 mm socket to remove the nut and washer on the other side.

Upper Shift Fork Disassembly

Remove the snap ring with snap ring pliers. Remove the washer.

Remove the cam pawl.

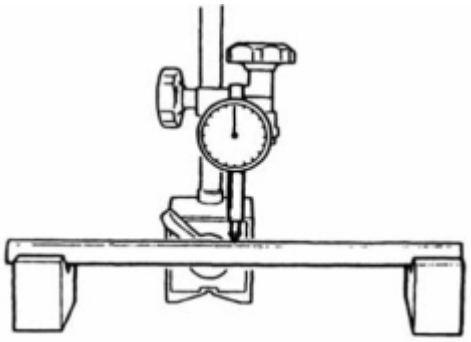
Remove the spring.

Remove the snap ring with snap ring pliers. Remove the washer and shift fork.

Inspection

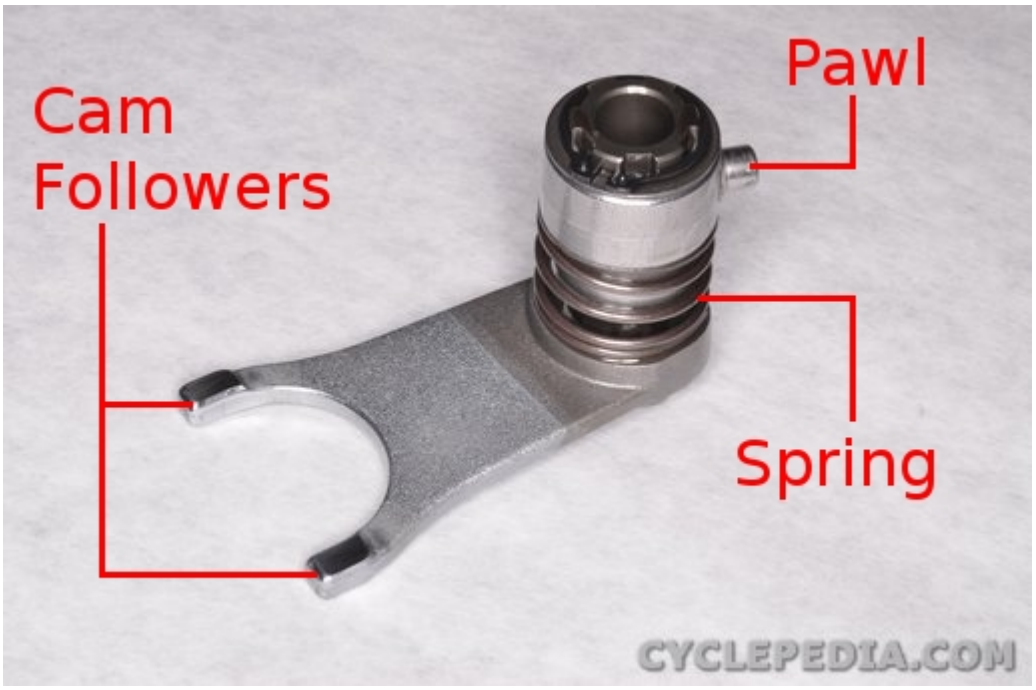
Check the stopper lever pawl for bends, damage or wear. Inspect the spring for cracks or damage.

Check the transmission drive shaft gear teeth for blue discoloration, pitting or wear.

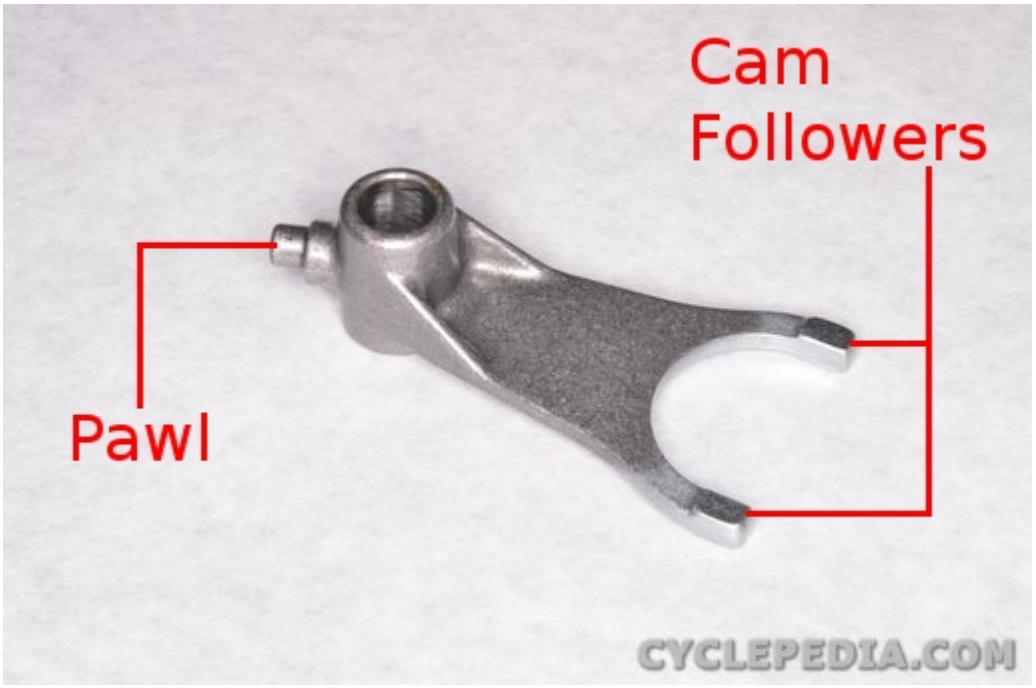


Measure the guide bar runout. Replace the bar if it is out of specification.

Item	Service Limit
Guide Bar Runout	0.03 mm (0.0012 in)

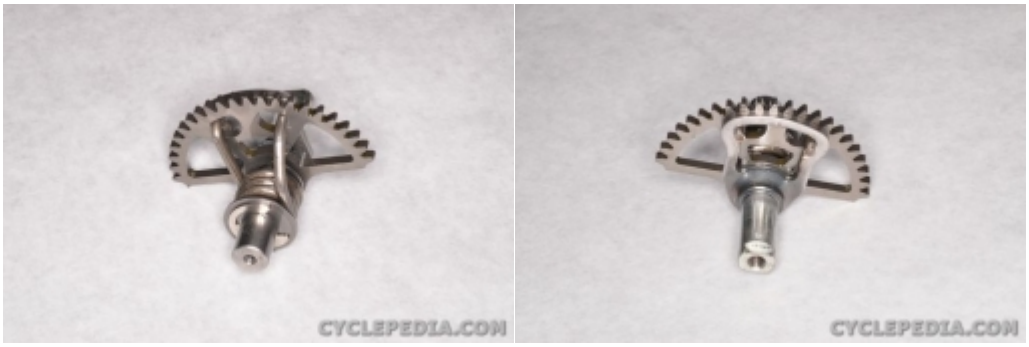


Inspect the upper shift fork cam followers, shift fork pawl and spring. If there is any damage or excessive wear replace the components as a set.



Inspect the upper shift fork cam followers and shift fork pawl. If there is any damage or excessive wear replace the part.

Check the shift cam grooves and shift cam gear. Check for wear and damage and replace if needed.



Inspect shift shaft gear and shift shaft for damage, bends or wear. Check the return spring for fatigue or damage. Replace the parts if needed.

Inspect the transmission bearings. See the Crankcase Bearings topic for more information.

To assemble the transmission see the Transmission Installation topic for more information.

Transmission Shafts

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

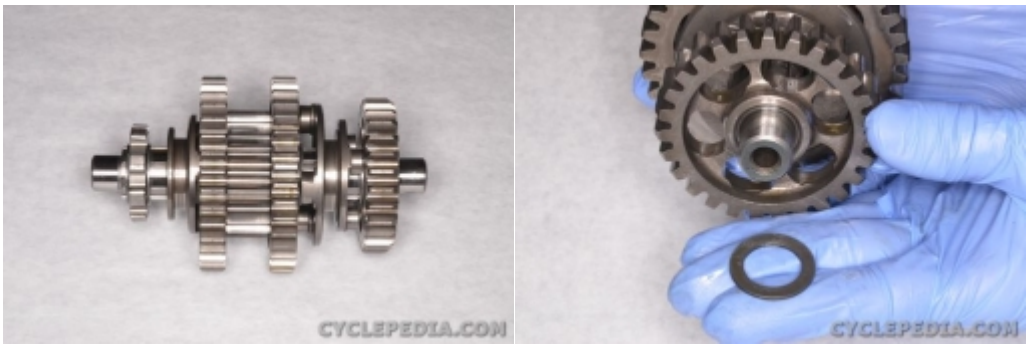
Remove the transmission shafts from the transmission. See the Transmission Removal topic for more information.

Disassembly

When disassembling the transmission shafts be sure to keep track of the order and orientation of the parts as they come apart. Discard old snap rings. Clean all of the components using aerosol brake cleaner and a lint free cloth. Inspect the parts for visible signs of wear or damage. Replace any defective components.

Inspect all of the shifter dogs carefully for wear, especially on the outer edges. Also inspect the slots or other dogs on adjoining gears that the dogs fit into or against. Damage to the dogs or slots can cause the transmission to jump out of gear. Replace any gears that are damaged or worn even a little bit.

Countershaft

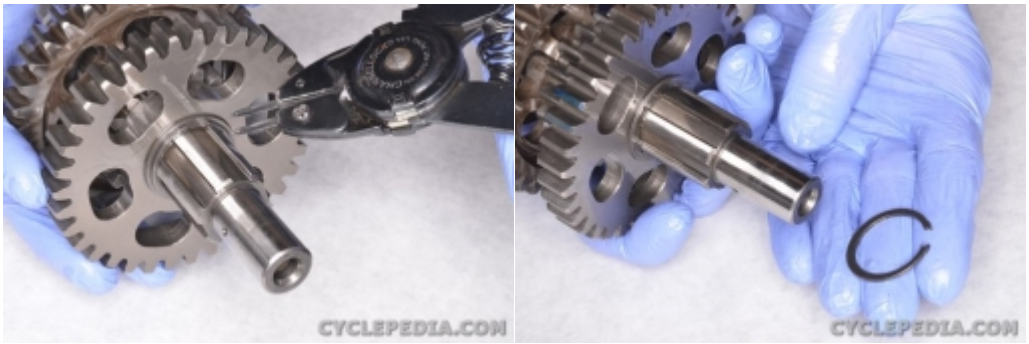


Remove the washer.

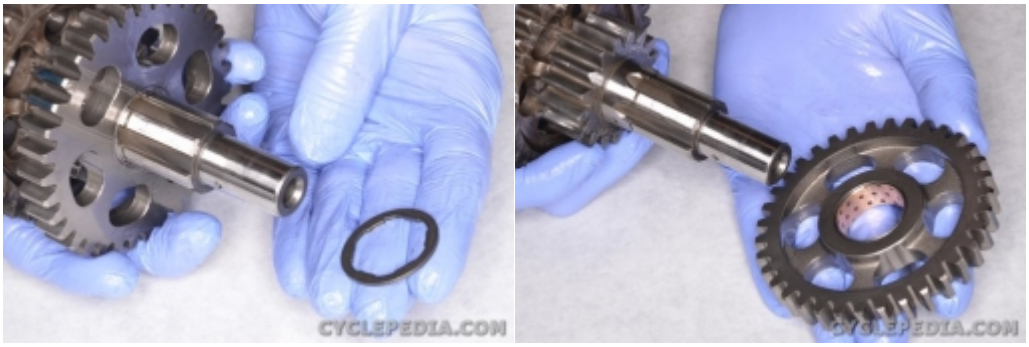
Remove the high drive gear.

Remove the bushing and washer.

Remove the high/low gear shifter.



Remove the snap ring with snap ring pliers.



Remove the washer and low drive gear.

On the other side of the countershaft; Remove the snap ring with snap ring pliers.

Remove the stopper wheel.

Remove the snap ring with snap ring pliers.

Remove the reverse gear shifter.

Remove the snap ring with snap ring pliers.

Remove the washer and reverse drive gear.

Inspect the countershaft, gear teeth and mated dogs. Check for blue discoloration, pitting or wear. Check for rounded edges, cracks or other damage. Replace as needed.

Organize the parts in the order and orientation as removed.

Bevel Gear Drive Shaft

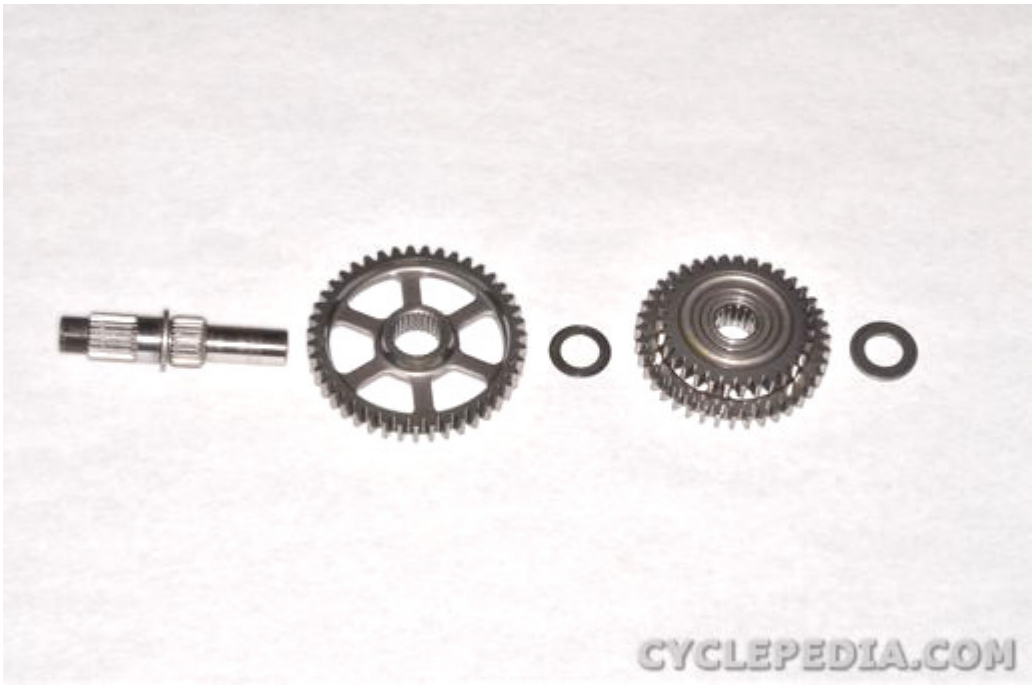
Remove the thick washer.

Remove the reverse gear.

Remove the thin washer.

Inspect the gear teeth. Check for blue discoloration, pitting or wear. Replace as needed.

Inspect the needle bearing in the reverse gear. Check for wear or damage. Replace as needed.



Organize the parts in the order and orientation as removed.

Assembly

Use new snap rings when assembling the transmission shaft components. Install the snap ring (and thrust washer) so that the sharp edge is facing away from the gear that is putting thrust against it. The sharp edge is shown in the photo on the left.

Also, make sure the snap rings are fully seated in their grooves as shown. Spread the new snap rings only enough to slide them down the shaft and into their grooves.

Note: Coat the gears and shafts lightly with fresh engine oil before installation.

Bevel Gear Drive Shaft

Install the thin washer on the drive shaft.

Install the reverse gear.

Install the thick washer.

Countershaft

Install the reverse drive gear and washer onto the countershaft as shown.

Install the snap ring with snap ring pliers.

Install the reverse gear shifter.

Install the snap ring with snap ring pliers.

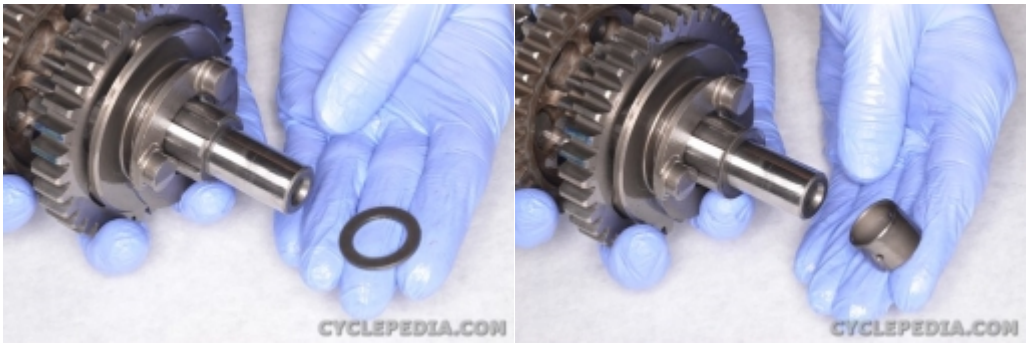
Install the stopper wheel.

Install the snap ring with snap ring pliers.

On the other side of the countershaft; Install the low drive gear and washer.

Install the snap ring with snap ring pliers.

Install the high/low gear shifter.



Install the washer and bushing.

Install the high drive gear.

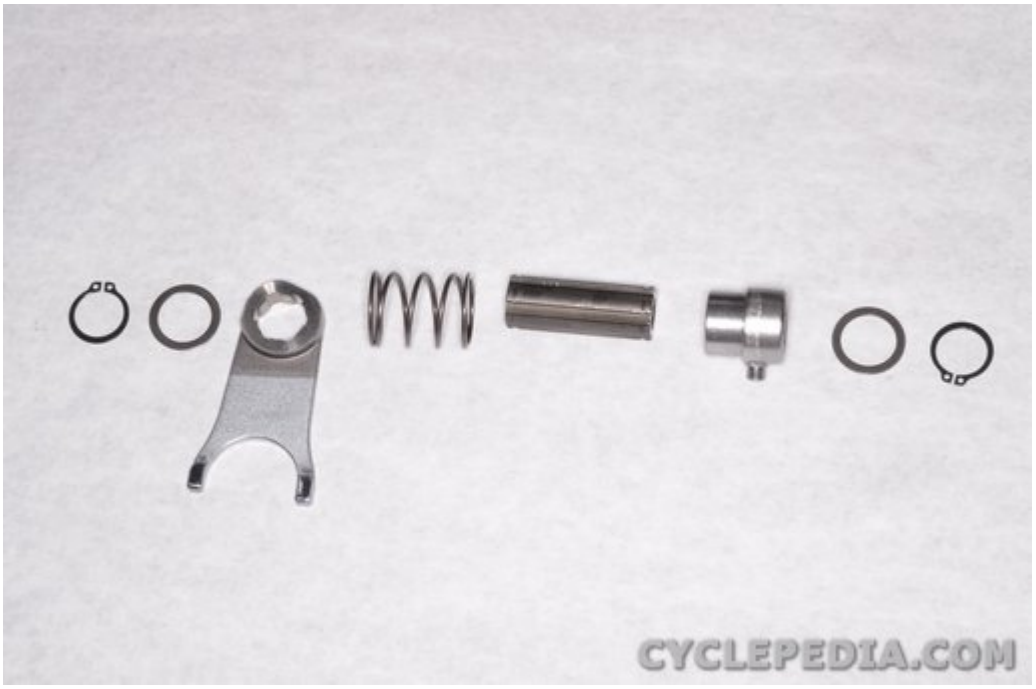
Install the washer.

To install the transmission see the Transmission Installation topic.

Transmission Installation

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Upper Shift Fork Assembly



Install the cam pawl on the shaft and be sure to align the marks as shown.

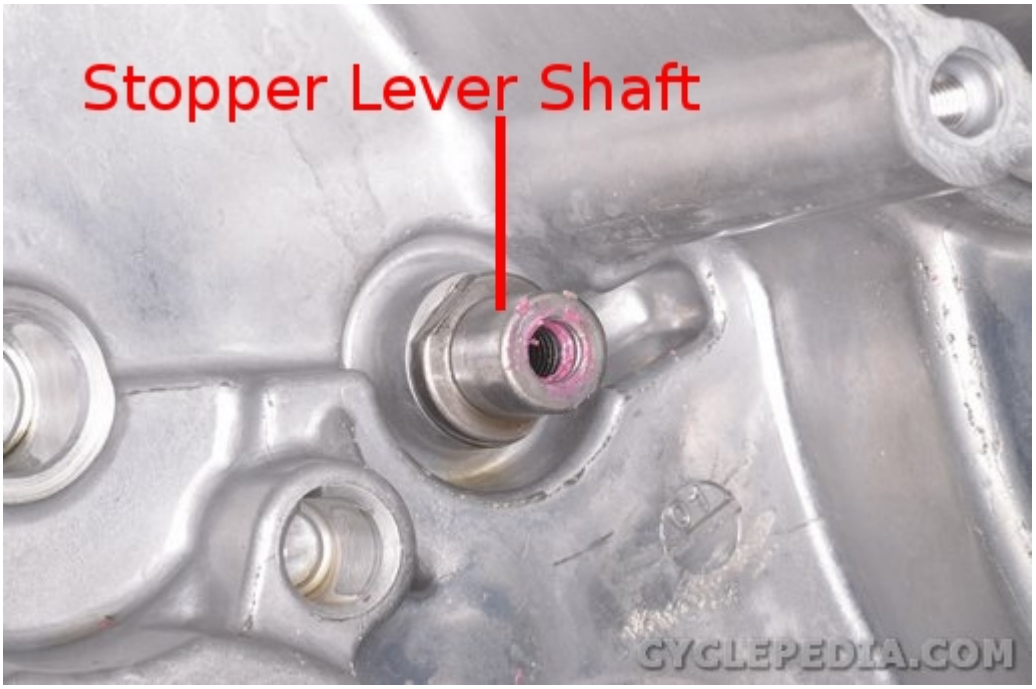
Install the washer.

Install the snap ring into the groove with snap ring pliers.

Install the spring.

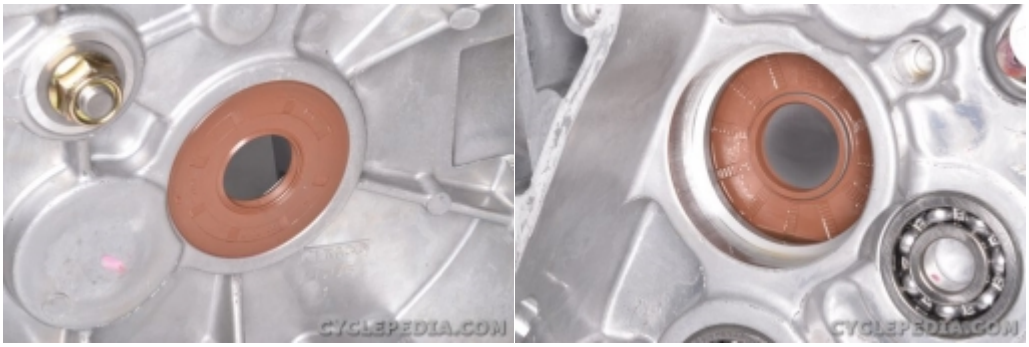
Install the shift fork on the shaft and be sure to align the marks as shown. Install the washer. Install the snap ring with snap ring pliers.

Installation



Install the stopper lever shaft if it was removed. Install the shaft on the outside and the nut with washer on the inside. Carefully hold the stopper lever shaft with a wrench if necessary. Tighten the bolt to specification with a 19 mm socket.

Item	N-m	kgf-m	ft-lb
Stopper lever shaft nut	30	3	21.6



Apply clean engine oil to a new drive shaft oil seal lip. Install the transmission drive shaft oil seal. Use a suitable driver that is the same outside diameter as the seal.

Install the stopper lever and spring on the shaft.

Note: Hook the spring onto the hook part of the stopper lever, squeeze the spring in to the groove of the left crankcase.

Install the washer and a new stopper lever bolt. Hold the shaft nut on the other side. Tighten the bolt to specification with a 6 mm Allen wrench.

Item	N-m	kgf-m	ft-lb
Stopper lever bolt	25	2.5	18

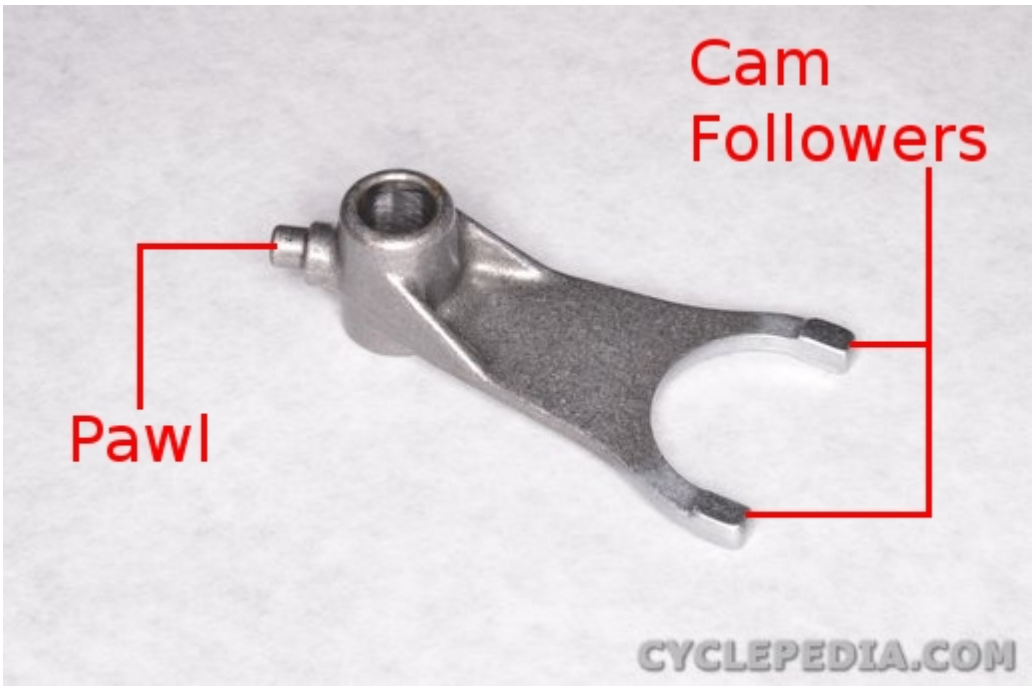
Install the transmission drive shaft bearing with a bearing driver.
Special Tool-
Bearing Driver: A120E00014

Note: Apply clean engine oil to the transmission drive shaft, countershaft and drive shaft.

Carefully press in the transmission drive shaft.

Install the transmission shafts together into the crankcase.

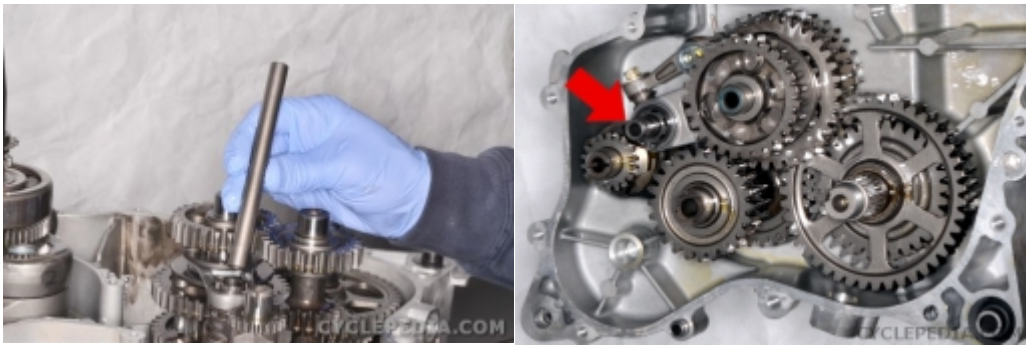
Apply clean engine oil to the shift cam and install it.



Apply clean engine oil to the upper and lower shift forks and pawls.

Install the lower gearshift fork into the lower shifter groove on the countershaft as shown. Fit the lower shift fork guide pin into the groove on the shift cam.

Install the upper gearshift fork into the upper shifter groove on the countershaft. Fit the upper shift fork guide pin into the groove on the shift cam.



Apply clean engine oil to the transmission guide bar and install it.

Install the shift shaft. Be sure to align the shift shaft mark with the shift cam gear marks as shown. Check the transmission operation.

Install the crankshaft and balancer shaft together (if they were removed). See the Crankshaft for more information.

Assemble the crankcases. See the Crankcase topic for more information.

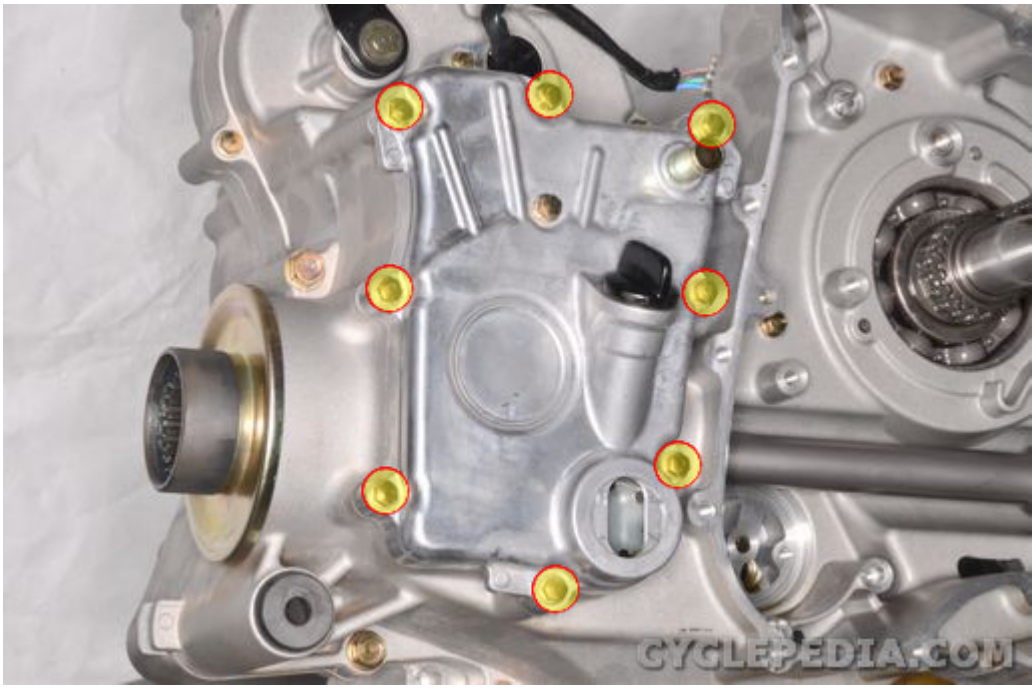
Output Shafts and Bevel Gear

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

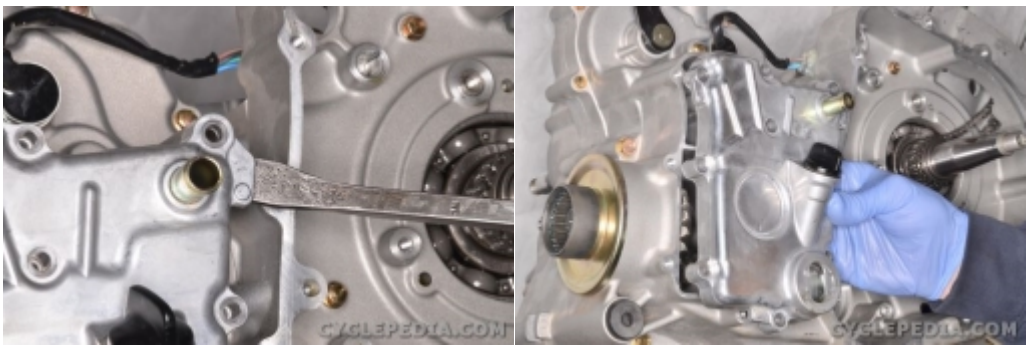
Removal

Remove these components	
Component	Topic
Drain the engine oil	Engine Oil
Drain the coolant	Coolant
Engine from the frame	Engine Removal
Water pump cover	Water Pump
Generator cover	Generator Cover
Generator flywheel	Flywheel
Oil pump	Oil Pump

Bevel Gear Cover



Remove the bevel gear case cover bolts with an 8 mm socket.

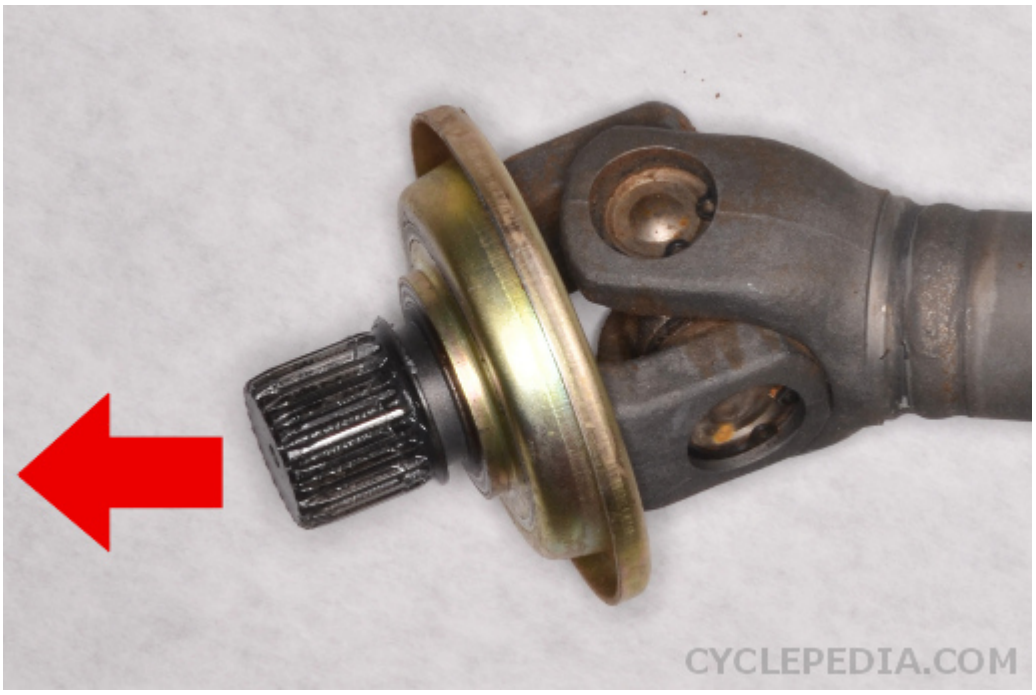


Remove the bevel gear cover. Utilize the pry points as needed.

Remove the gasket and the two bevel gear cover dowel pins.

Output Shaft and Bevel Gears

Unstake the output shaft nut with a chisel and a hammer.



Insert the front propeller shaft and hold it to keep the output shaft from turning.

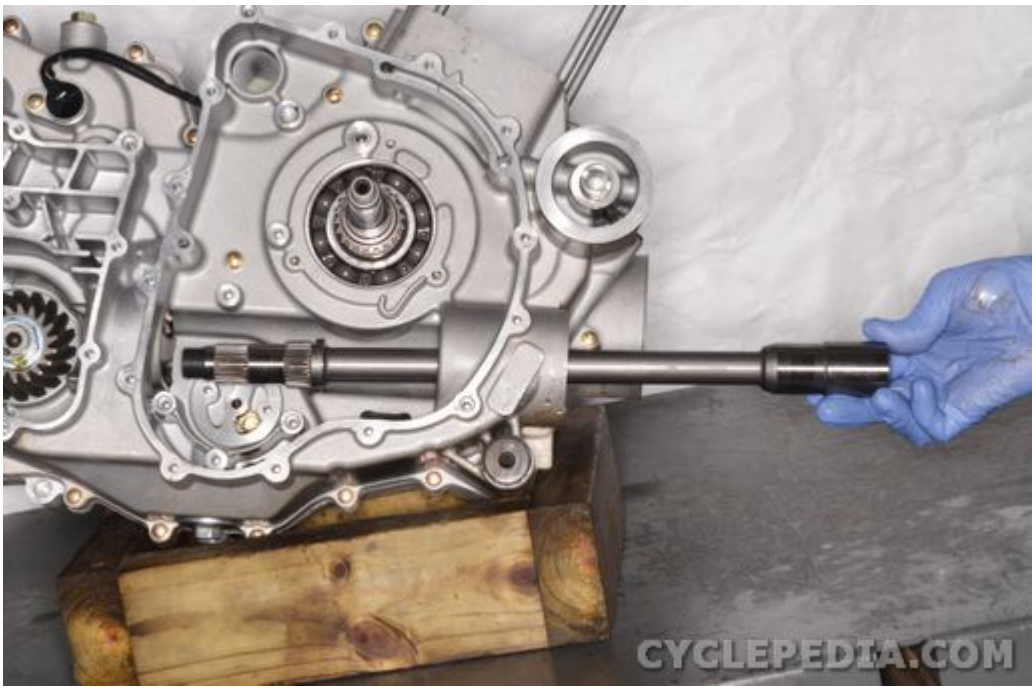
Loosen the output shaft nut with a 26 mm socket.

Remove output shaft nut.

Remove the rear propeller shaft coupler from the engine.

Tap the output shaft forward with a rubber mallet.

Move the output shaft forward so that the driven bevel gear can be removed.
Remove the driven bevel gear and shim.



Slide the output shaft out of the engine.

Unstake drive bevel gear nut with a chisel and a hammer.

Remove the belt case cover. See the CVT Removal topic. Hold the driven pulley with a Y-type holder.

Special Tool -
Y-Type Holder: A120E00056

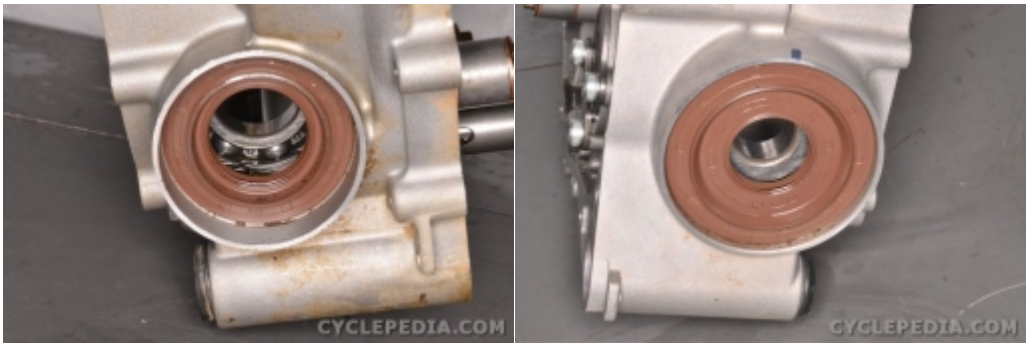
Loosen the drive bevel gear nut with a deep well 26 mm socket.

Remove the drive bevel gear nut.

Slide off the drive bevel gear.

Remove the drive bevel gear shim.

Seals and Bearings



Inspect the propeller shaft oil seals for leaks and damage.

Inspect the bearings by turning them with a finger. Replace the bearings if they do not turn smoothly.

Remove the seals with a seal pick if needed. Replace the oil seals with new items if they are removed.

If the rear bearing needs to be replaced the lock nut must be removed.

Remove the lock nut with the special tool.

Special Tool -
Nut Wrench: A120E00066

Remove the rear bearing with a suitable bearing puller.

Special Tool-
Bearing Puller: A120E00037

Drive in the new bearing with a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out.

Special Tool -
Bearing Driver: A120E00014

Install the lock nut with the special tool.

Special Tool -

Nut Wrench: A120E00066

Torque the lock nut to specification with the special tool.

ITEM	N-m	kgf-m	ft-lb
Driven pulley nut	110	11	79.2

If the front bearing is to be replaced the snap ring must be removed.

Remove the bearing snap ring with snap ring pliers.

Remove the bearing with a suitable bearing puller.

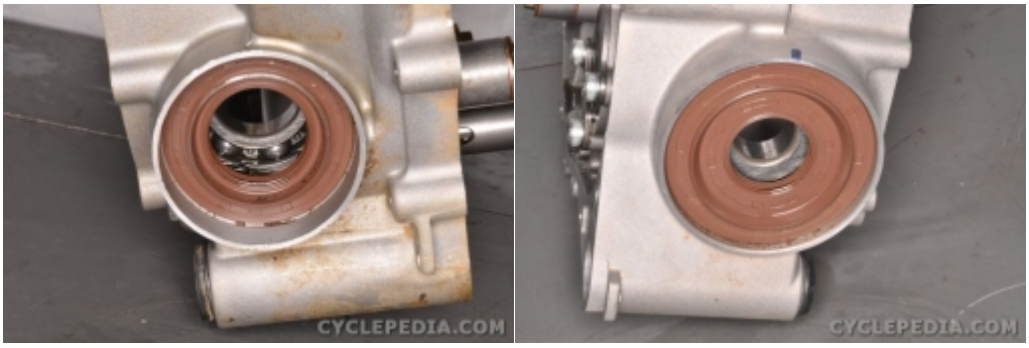
Special Tool-
Bearing Puller: A120E00037

Drive in the new bearing with a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out.

Special Tool -
Bearing Driver: A120E00014

Install a new snap ring with snap ring pliers.

Lubricate the lips of the new oil seals with fresh engine oil.



Press in the new seals with a suitable driver with the same outside diameter as the seals.

Inspection

Inspect the propeller shaft couplers for wear and damage.

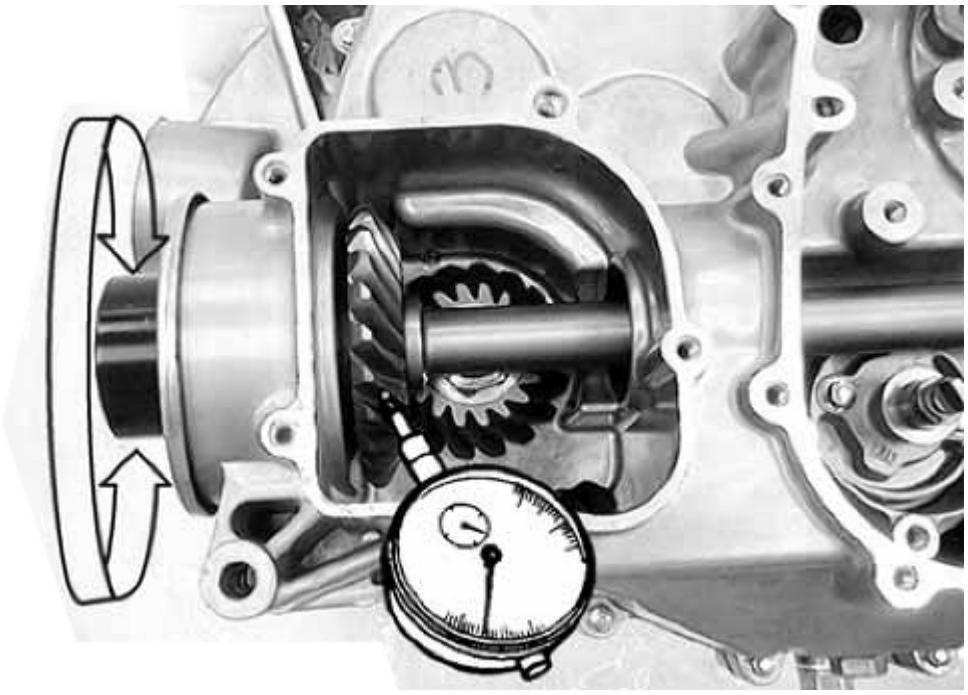
Inspect the bevel gears for wear and damage.

Inspect the output shaft for damage and wear.

Bevel Gear Backlash

Remove the bevel gear cover. The bevel gears must be installed as normal.

Set a dial gauge on the driven bevel gear as shown.



Measure the backlash by turning the rear propeller shaft in each direction, reading the total backlash on the dial gauge. If the backlash is not within specification, the shim must be changed and the backlash should be rechecked until correct.

Bevel gear backlash	0.03 - 0.15 mm (0.001 - 0.006 in)

See the chart for appropriate shim thickness.

Backlash	Shim Adjustment
under 0.03 mm (0.001 in)	Reduce shim thickness
0.03 - 0.15 mm (0.001 - 0.006 in)	Correct shim thickness
over 0.15 mm (0.006 in)	Increase shim thickness

Drive/Driven bevel gear shims	
A	0.6 mm (0.024 in)
B	0.65 mm (0.026 in)
C	0.7 mm (0.028 in)
D	0.75 mm (0.03 in)
E	0.8 mm (0.032 in)
F	0.85 mm (0.034 in)

G	0.9 mm (0.036 in)
H	0.95 mm (0.038 in)
I	1 mm (0.04 in)
J	1.05 mm (0.042 in)
K	1.1 mm (0.044 in)
L	1.15 mm (0.046 in)

Bevel Gear Tooth Contact

After the backlash adjustment is carried out, the tooth contact must be checked as indicated below.

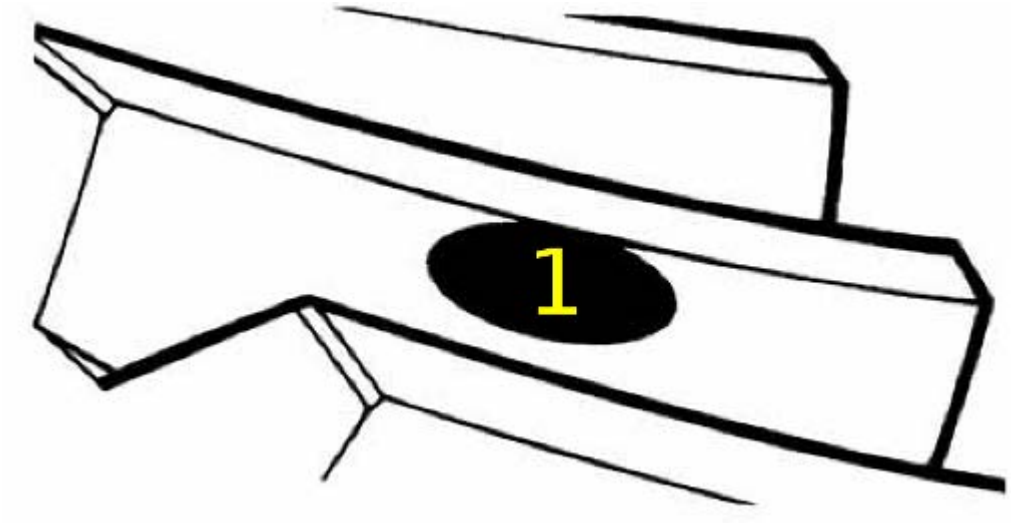
• Remove the driven bevel gear.

• Clean and degrease the teeth of the drive and driven bevel gears. Apply a coating of machinist's layout dye or paste to several teeth of the driven bevel gear.

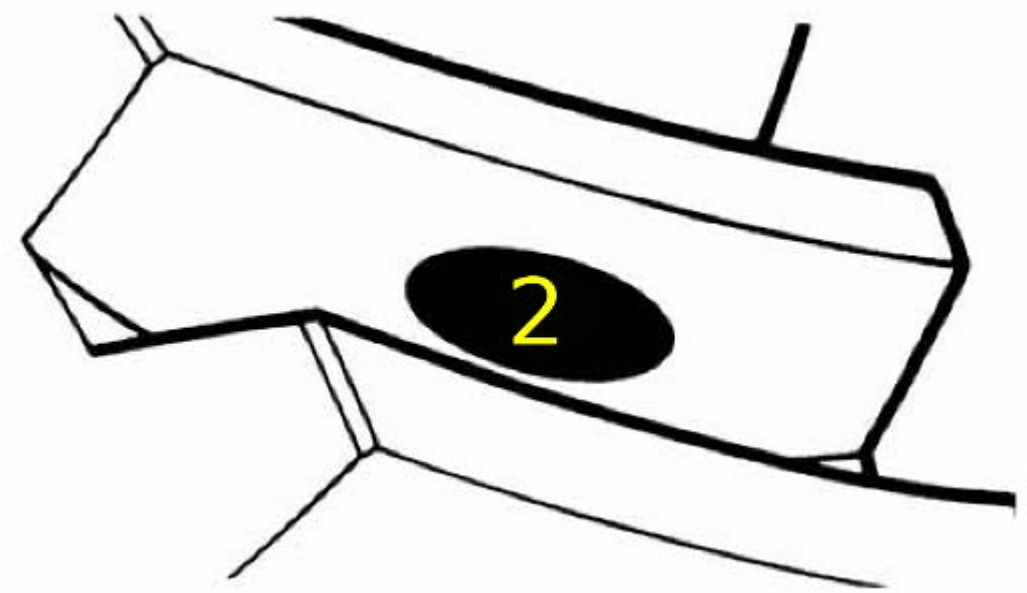
• Install the driven bevel gear.

• Rotate the rear propeller shaft several turns in both directions.

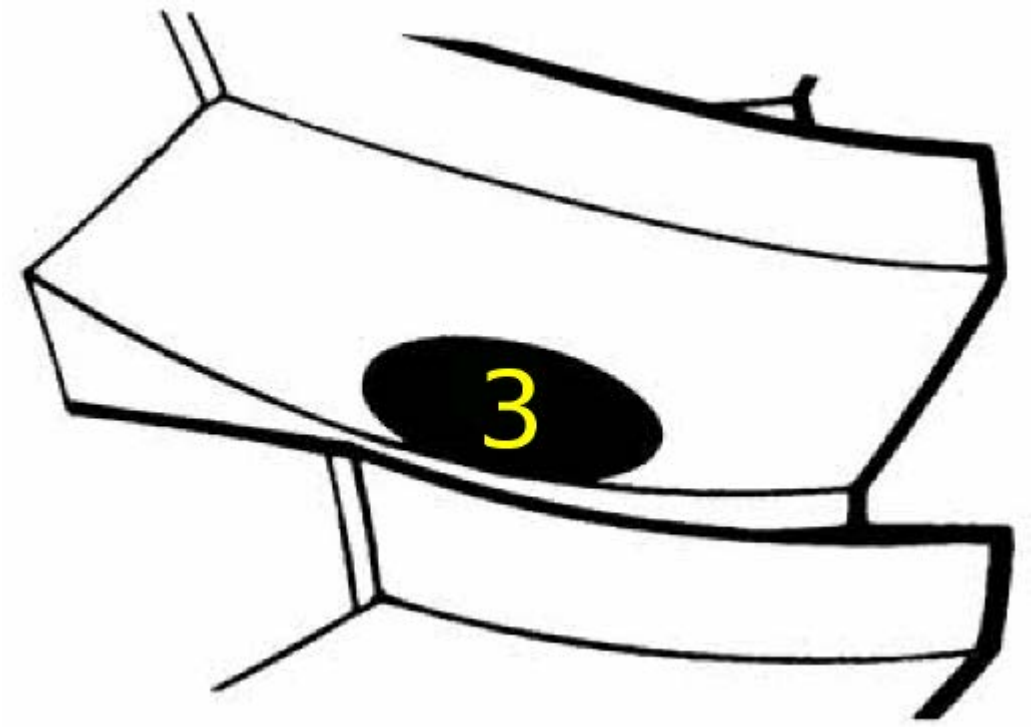
• Remove the driven bevel gear and inspect the coated teeth of the drive bevel gear. The tooth contact pattern should be as shown the examples 1, 2 and 3.



1 - Incorrect (contact at tooth top)



2 - Correct



3 -

• If tooth contact is found to be correct (example 2) complete the installation.

• If tooth contact is found to be incorrect (examples 1 and 3), the shim thickness between the drive bevel gear and driven bevel gear must be changed and the tooth contact rechecked until correct.

Tooth Contact	Drive Bevel Gear Shim Adjustment	Driven Bevel Gear Shim Adjustment
Contact at tooth top (1)	Increase shim thickness	Increase shim thickness
Contact at tooth root (3)	Reduce shim thickness	Reduce shim thickness

Make sure to check the backlash after the tooth contact has been adjusted. The tooth contact shim adjustment may have changed the backlash. Adjust the tooth contact and backlash until they are both within specification. If the correct tooth contact cannot be maintained when adjusting the backlash, replace the drive and driven bevel gears.

Installation

Output Shaft and Bevel Gears

Install the drive bevel gear shim.

Slide on the drive bevel gear.

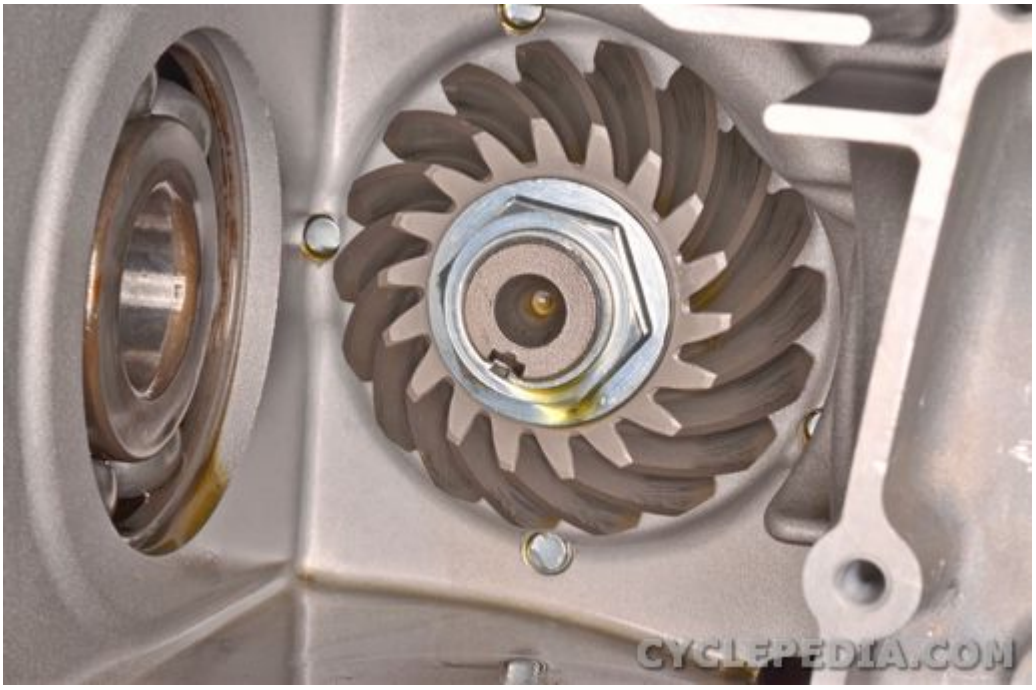
Lubricate the new drive bevel gear lock nut threads with engine oil. Thread on the new drive bevel gear lock nut.

Hold the driven pulley with a Y-type holder.

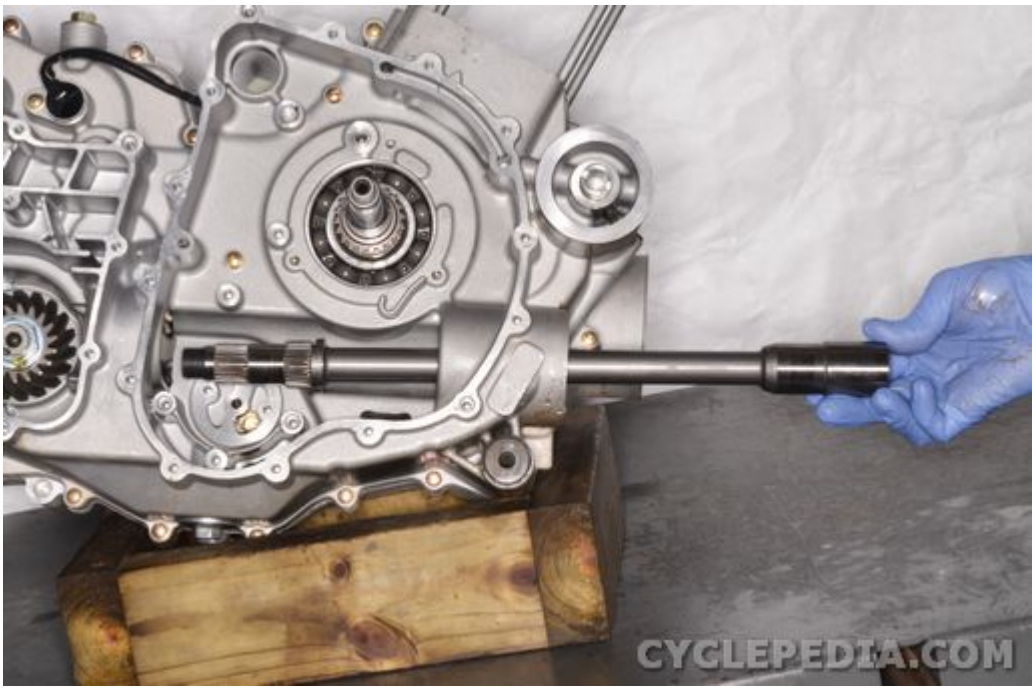
Special Tool -
Y-Type Holder: A120E00056

Tighten the drive bevel gear nut to specification with a deep well 26 mm socket.

ITEM	N-m	kgf-m	ft-lb
Drive bevel gear lock nut	140	14	100.8



Stake the drive bevel gear lock nut with a chisel and a hammer.



Slide the output shaft into the engine as shown.

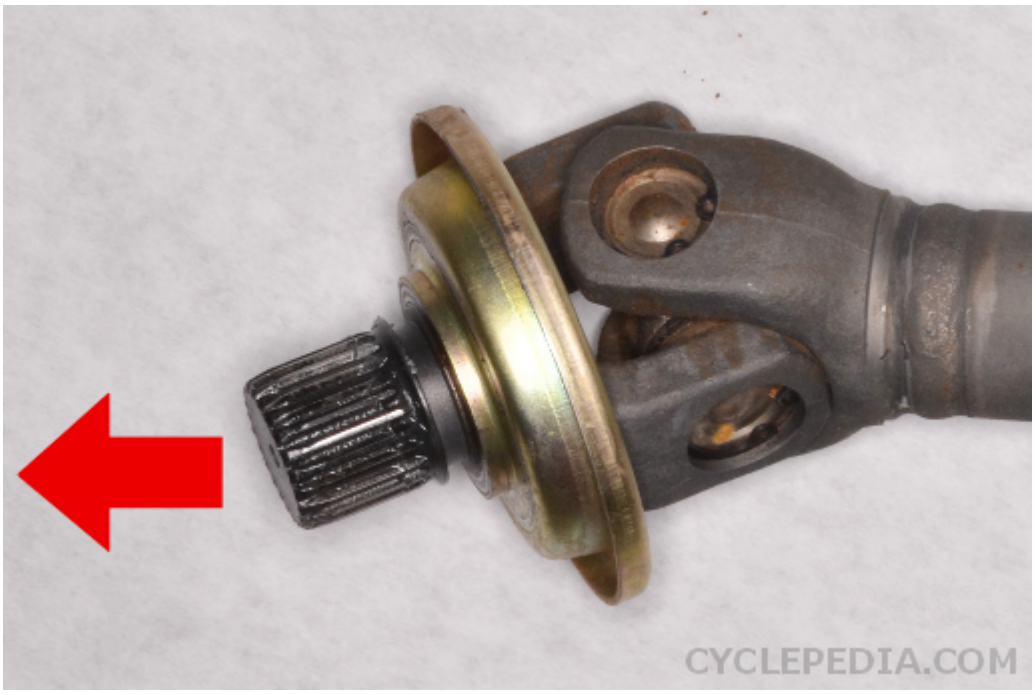
Fit the driven bevel gear and shim into place.

Guide the output shaft through the driven bevel gear and shim.

The output shaft must protrude through the seal.

Install the rear propeller shaft coupler.

Lubricate the new output shaft nut threads with engine oil. Install the new output shaft nut.



Insert the forward propeller shaft and hold it to keep the output shaft from turning.

Tighten the output shaft nut to specification with a 26 mm socket.

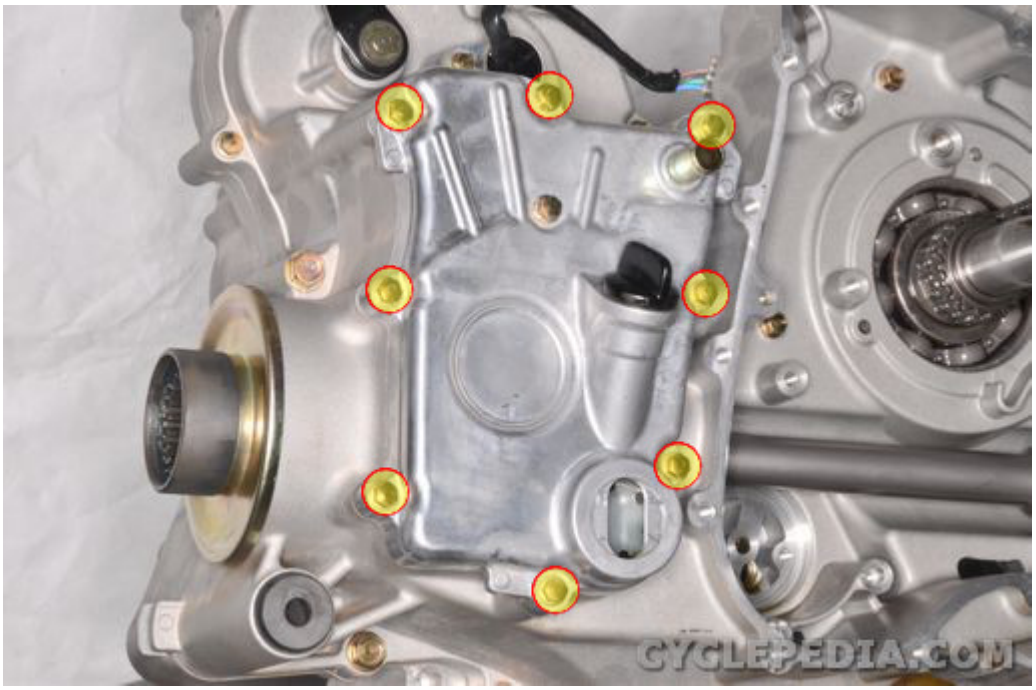
ITEM	N-m	kgf-m	ft-lb
Driven bevel gear lock nut	140	14	100.8

Stake the output shaft nut with a chisel and a hammer.

Bevel Gear Cover

Install two bevel gear cover dowel pins and a new gasket.

Fit the bevel gear cover into place.



Install the five bevel gear case cover bolts. Tighten the bolts evenly and securely with an 8 mm socket.

Install these components	
Component	Topic
Oil pump	Oil Pump
Generator flywheel	Flywheel
Generator cover	Generator Cover
Water pump cover	Water Pump
Install the engine into the frame	Engine Installation
Drain the coolant	Coolant
Drain the engine oil	Engine Oil

6.Cooling System

This chapter covers the location and servicing of the external components for the KYMCO MXU 700i and MXU 500i models.

1.Coolant 6-4
2.Pressure Testing 6-13
3.Radiator 6-16
4.Thermostat 6-30
5.Water Pump 6-37

GENERAL INSTRUCTIONS

WARING: Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

CAUTION: Radiator coolant is toxic. Keep it away from eyes, mouth, skin and clothes.

• If any coolant gets in your eyes, rinse them with water and consult a physician immediately.

• If any coolant in swallowed, induce vomiting, gargle and consult a physician immediately.

• If any coolant gets on your skin or clothes, rinse thoroughly with plenty of water.

NOTE: Use coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

• This section covers sen-ice of the cooling system

• Add coolant at the reserve tank. Do not remove the radiator cap except to refill or drain the system

• All cooling system services can be done with the engine in the frame.

• Avoid spilling coolant on painted surfaces.

• After servicing the system, check for leaks with a cooling system tester.

TROUBLESHOOTING

Engine temperature too high

• Faulty temperature gauge or sensor
• Faulty radiator cap
• Air in system
• Faulty thermostat (stuck closed)
• Insufficient coolant
• Passages blocked in hoses or water jacket
• Clogged radiator fins
• Passages blocked in radiator
• Faulty water pump
• Faulty fan motor switch

Engine temperature too low

• Faulty temperature gauge or sensor
• Faulty thermostat (stuck open)
• Faulty fan motor switch

Coolant leaks

- Faulty water pump mechanical (water) seal
- Deteriorated O-rings
- Damaged or deteriorated water hoses
- Loose hose connection or clamp
- Damaged or deteriorated cylinder head gasket
- Faulty radiator cap

Coolant

SAFETY FIRST: Antifreeze is highly toxic and can kill pets and animals if drank. Do not leave coolant where animals (including children) can get to it.

WARING: Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

Remove the front cover. See the Front Cover topic for more information.

The coolant reservoir is located in front of the steering shaft.

Check the coolant when cold. The coolant level should be between the two indicator lines.

If the level is low, remove the reserve tank cap (1) and fill the tank to the “FULL” level line with 1:1 mixture of distilled water and antifreeze

Caution: Using coolant with silicate inhibitors may cause premature wear of water pump seals or blockage of radiator passages. Using tap water may cause engine damage.

Check to see if there are any coolant leaks when the coolant level decreases very rapidly. If reserve tank becomes completely empty, there is a possibility of air getting into the cooling system. Be sure to remove all air from the cooling system.

Draining

Remove these components	
Component	Topic
Right side covers	Side Covers

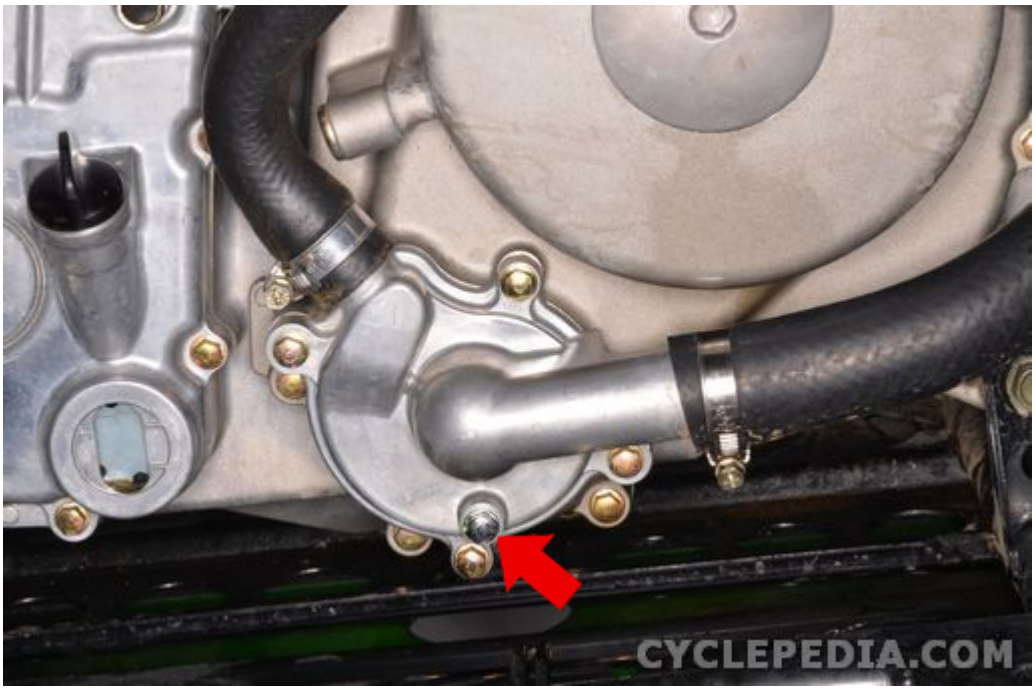
Right mudguard	Mudguards and Footrests
Front cover	Front Cover

Note: The engine should be at room temperature to prevent coming into contact with scalding coolant.

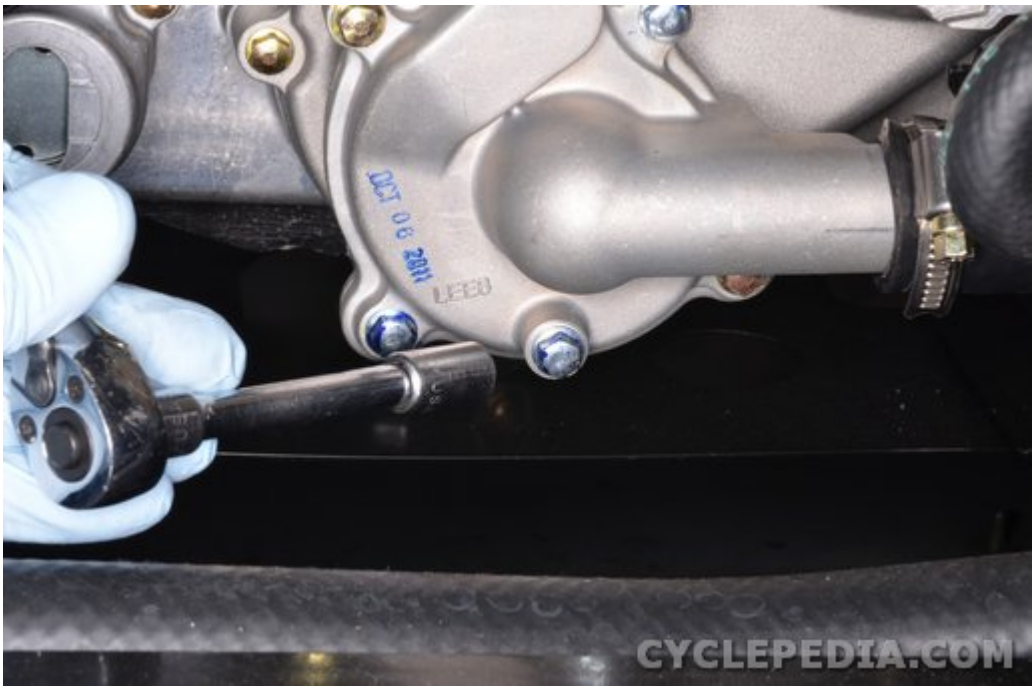
Place the vehicle in a level upright position on a flat surface.

The radiator filler cap is located beside the coolant reservoir tank and steering shaft.

Remove the radiator cap by pushing down and turning it. Use a shop towel to hold the cap. Remove the radiator cap in two stages. Allow any built up pressure to vent, then open the cap all the way and remove it.



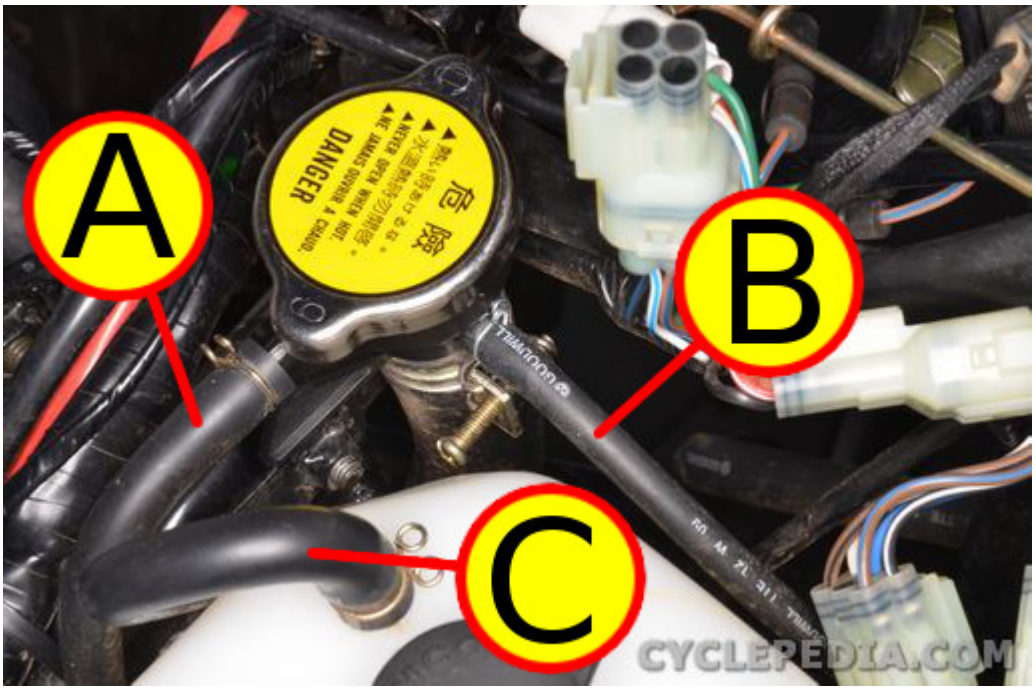
The drain bolt is located on the water pump. Some models may not be equipped with a drain bolt. In this case remove the small bypass coolant hose from the water pump and allow the coolant to drain.



Place a drain pan underneath the water pump and remove the drain plug using an 8 mm socket.

Be prepared the coolant will spurt out quickly. Allow the coolant to fully drain.

Install the drain plug with a new sealing washer and tighten it securely after the cooling system has been drained. Return the bypass hose to the water pump if it was removed and tighten the clamp.



To drain the reservoir tank remove the two mounting bolts. Disconnect the siphon hose (A) from the filler cap neck. and drain the reservoir tank. Install the tank and tighten the two mounting bolts securely. Connect the siphon hose (A)

to the filler cap neck and secure it with the clamp. The reservoir overflow hose (C) connects to the top of the reservoir tank.

Refilling

Use a suitable coolant that is rated to be used with an aluminum engine.

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.4 liter, 2.54 US qt. (MXU700i) 1.95 liter, 2.06 US qt. (MXU500i)
	Reserve tank	0.3 liter, 0.32 US qt.
Radiator cap relief pressure		90 kPa (0.9 kgf/cm^2, 12.8 psi)
Thermostat	Begin to open	69 - 73°C (156 - 163°F)
	Fully open	85°C (185°F)
	Valve lift	8 mm (0.3 in) minimum
Standard coolant concentration		1:1 mixture with soft water

COOLANT GRAVITY CHART											
	Temperature °C										
Coolant Concentration	0	5	10	15	20	25	30	35	40	45	50
5%	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.009	0.997
10%	1.018	1.107	1.017	1.016	1.015	1.014	0.013	1.011	1.009	1.007	1.005
15%	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20%	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25%	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30%	1.053	1.051	1.051	1.049	1.047	1.045	1.043	1.041	1.038	1.035	1.032
35%	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40%	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047

45%	1.080	1.078	1.076	1.074	1.072	1.069	1.056	1.063	1.062	1.057	1.054
50%	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55%	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60%	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

Remove the reservoir tank cap.

Fill the reservoir with coolant to the FULL line.

Slowly pour the new coolant into the radiator filler neck until it reaches the bottom of the neck.

With the reservoir cap and the radiator cap off, start the engine and let it run for several minutes. Blip the throttle and rev the engine a few times. This will purge any air out of the cooling system. Add coolant to the radiator and the reservoir tank as needed.

Install the reservoir cap and the radiator cap and bring the engine up to operating temperature. Check the level of the coolant in the reservoir tank and add coolant if necessary. Do not remove the radiator cap with the engine hot!!!

Pressure Testing

SAFETY FIRST: Antifreeze is highly toxic and can kill pets and animals if drank. Do not leave coolant where animals (including children) can get to it.

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

CAUTION: Never remove the radiator cap when the engine is hot.

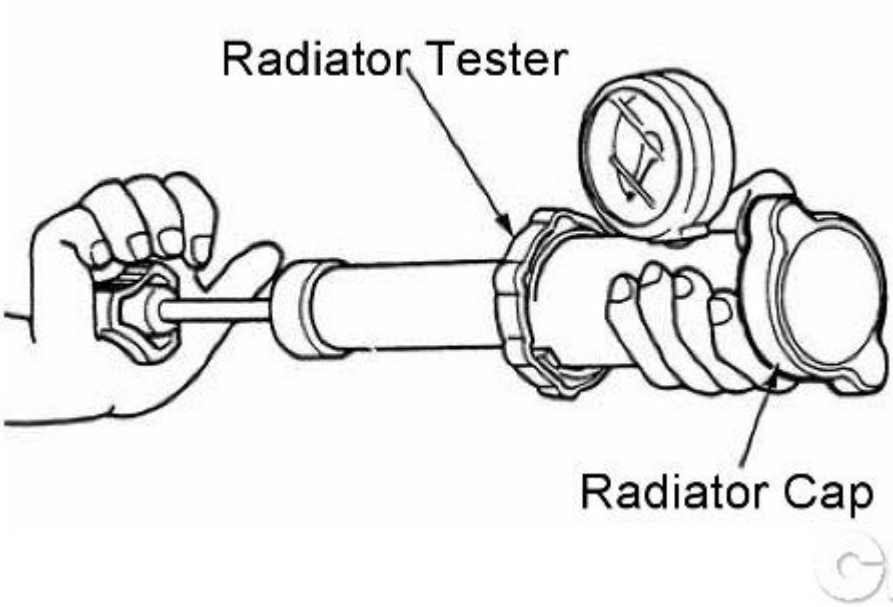
Remove the front cover. See the Front Cover topic for more information.

The radiator filler cap is located beside the coolant reservoir tank and steering shaft.

Remove the radiator cap by pushing down and turning it. Use a shop towel to hold the cap. Remove the radiator cap in two stages. Allow any built up pressure to vent, then open the cap all the way and remove it.

When checking the cooling system for leaks you will need a pressure tester. Remove the radiator cap, wet the tester seal, and install the end of the pressure tester onto the filler neck. Pump the tester up until the gauge reads 0.9 kg/cm^2 or 12.8 psi. The cooling system should hold this pressure for at

least 6 seconds. If it does not you will need to inspect the entire system for leaks. Do not pressurize the cooling system more than 1.05 kg/cm^2 or 14.9 psi.



Wet the seal on the radiator cap and install it to the pressure tester. Replace the cap if it does not relieve the pressure as specified.

Radiator cap relief pressure	90 kPa (0.9 kgf/cm^2, 12.8 psi)

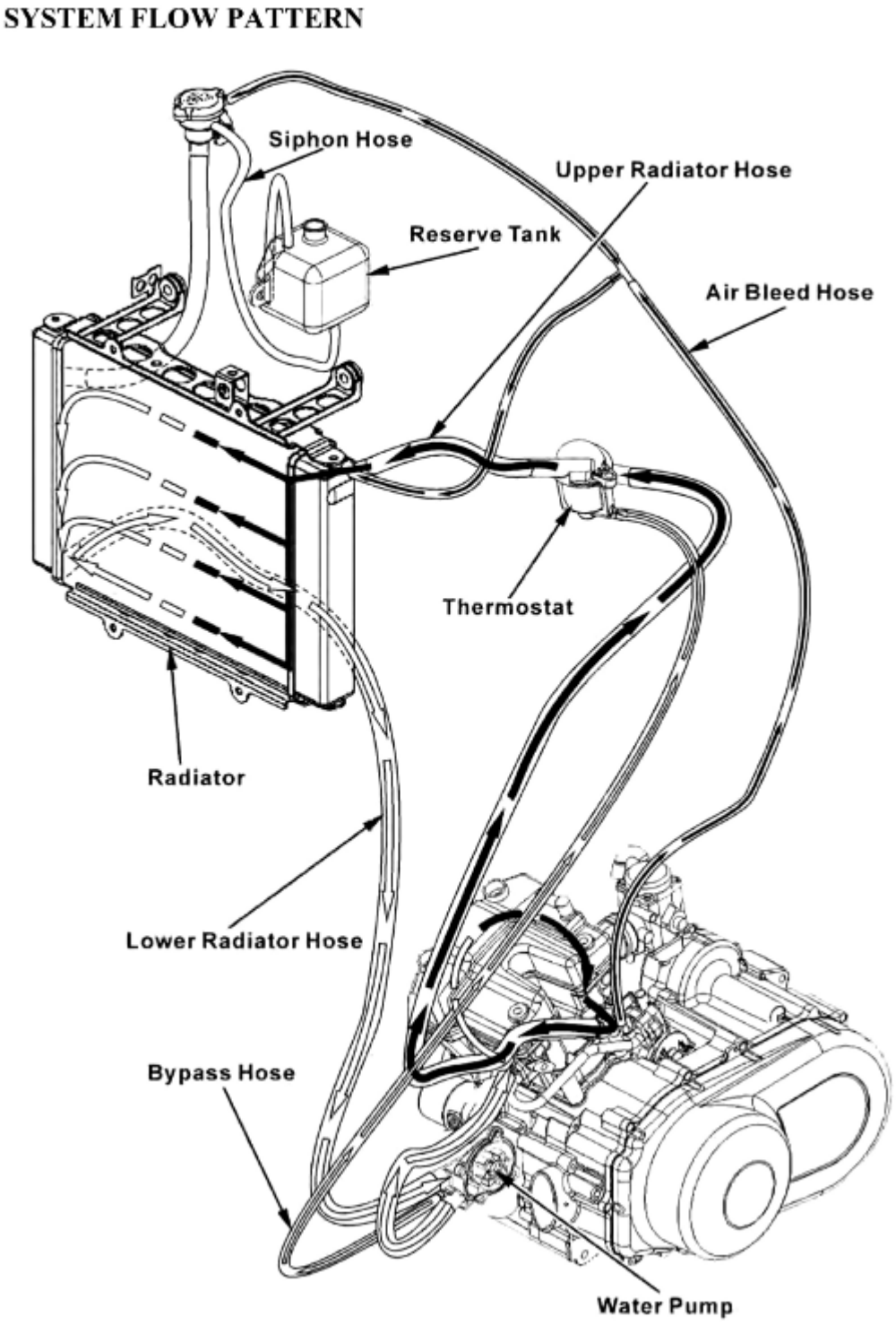
Radiator

SAFETY FIRST: Antifreeze is highly toxic and can kill pets and animals if drank. Do not leave coolant where animals (including children) can get to it.

WARING: Removing the radiator cap while the engine is hot can allow the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the radiator cap.

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Cooling System Diagram (MXU500)



Pressure Testing

See the Pressure Testing topic.

Removal

Remove these components	
Component	Topic
Front rack	Racks
Seat	Seat
Front cover	Front Cover
Side covers	Side Covers
Fuel tank cover	Fuel Tank
Front mudguard fasteners	Mudguards and Footrests
Front fender	Front Fender
Drain the coolant	Coolant
Front CVT cooling duct	CVT Cooling Ducts
Front bumper	Front Bumper

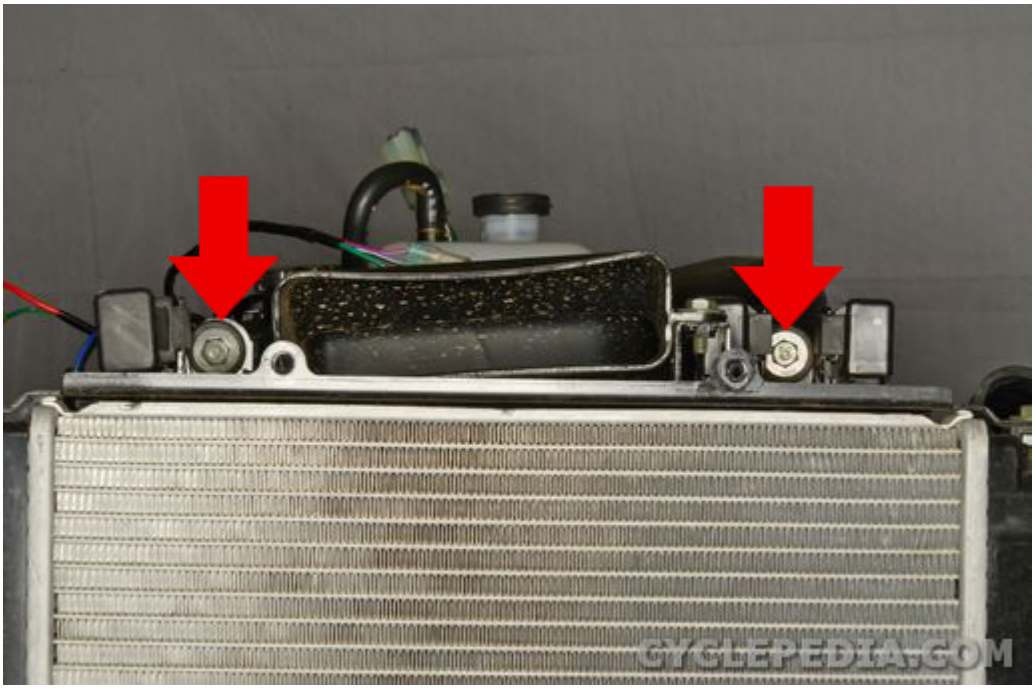
Loosen the upper clamp on the front CVT cooling duct.

The MXU 700i radiator has three hoses; a water pump hose (lower right), a filler neck hose (upper right), and a thermostat hose (upper left). The MXU 500 also has a small air bleed hose that connects to the radiator. Loosen the clamps and free the hoses from the radiator.

Unplug the radiator fan connector.

The radiator cowling is held on with four bolts.

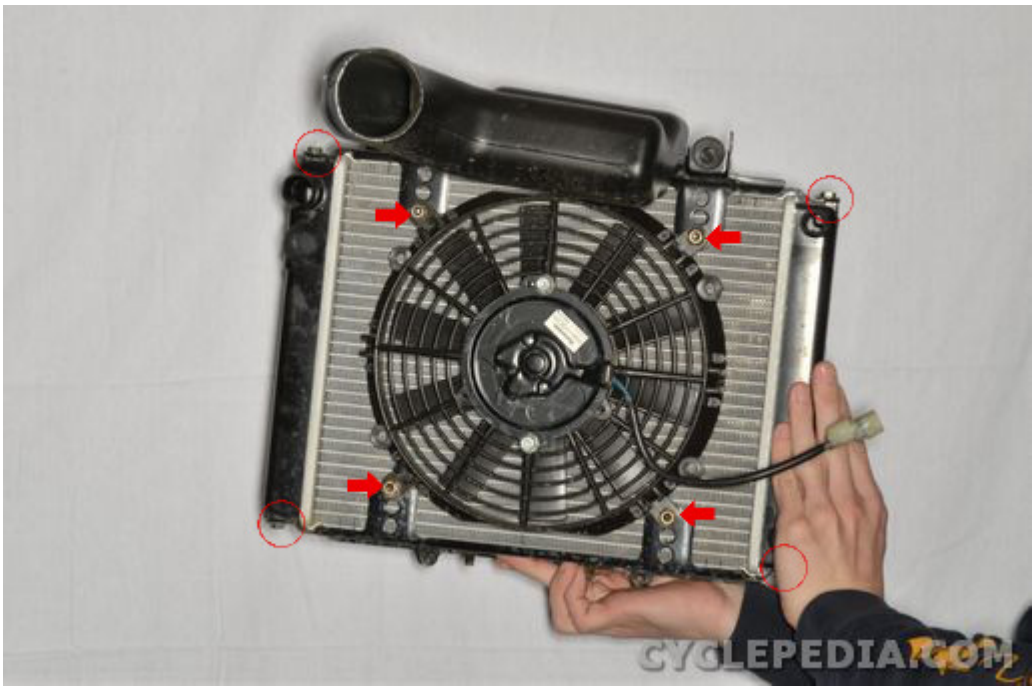
Remove the two upper and two lower radiator cowling bolts.



There are three relays that are ride on the radiator mounts. Free the relays from the fingers on the radiator mounts. Remove the two radiator mounting bracket to frame bolts.

Lift up the radiator and free the studs from the rubber grommets

Remove the radiator and bracket from the frame.



To remove the radiator fan remove the four nuts. To remove the upper and lower mounting brackets take out the bolts on the corners. To remove the upper front cooling duct remove the bolt with a 10 mm socket.

Inspection

Radiator Fins

Inspect the radiator fins for damage and clogging.

Clean out the fins with low pressure compressed air and water.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

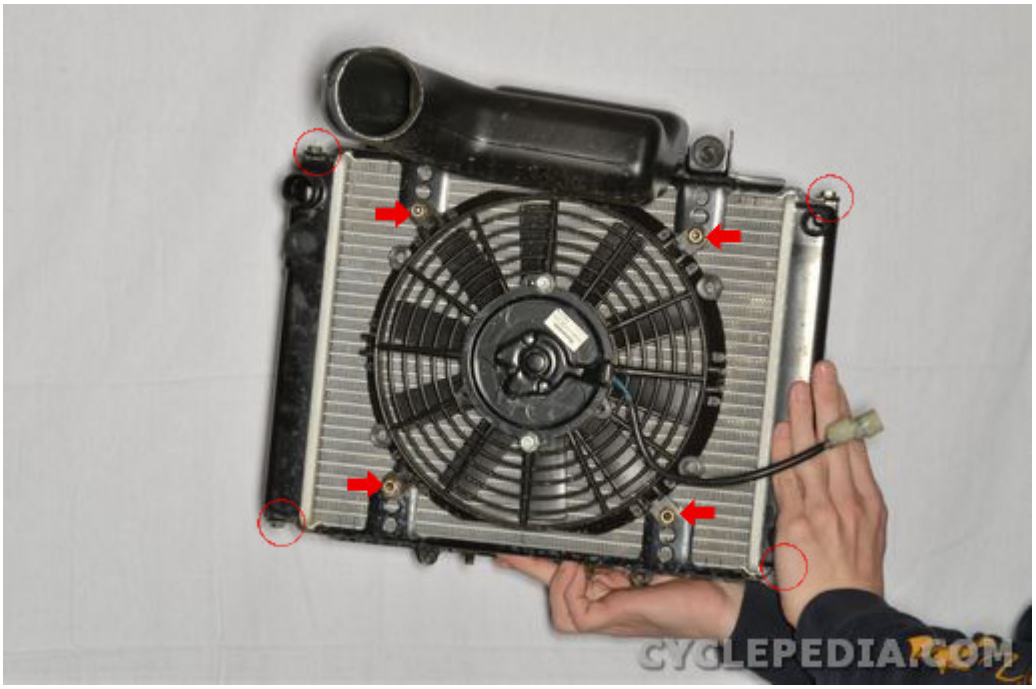
Check the radiator for any bent or damaged fins. Use a small flat blade screwdriver to straighten them out, but be careful not to puncture the radiator.

Radiator Fan

Jump a 12 volt battery to the fan connector and make sure the radiator fan operates.

To inspect the water temperature sensor (WTS) see the Fuel Injection Sensors topic.

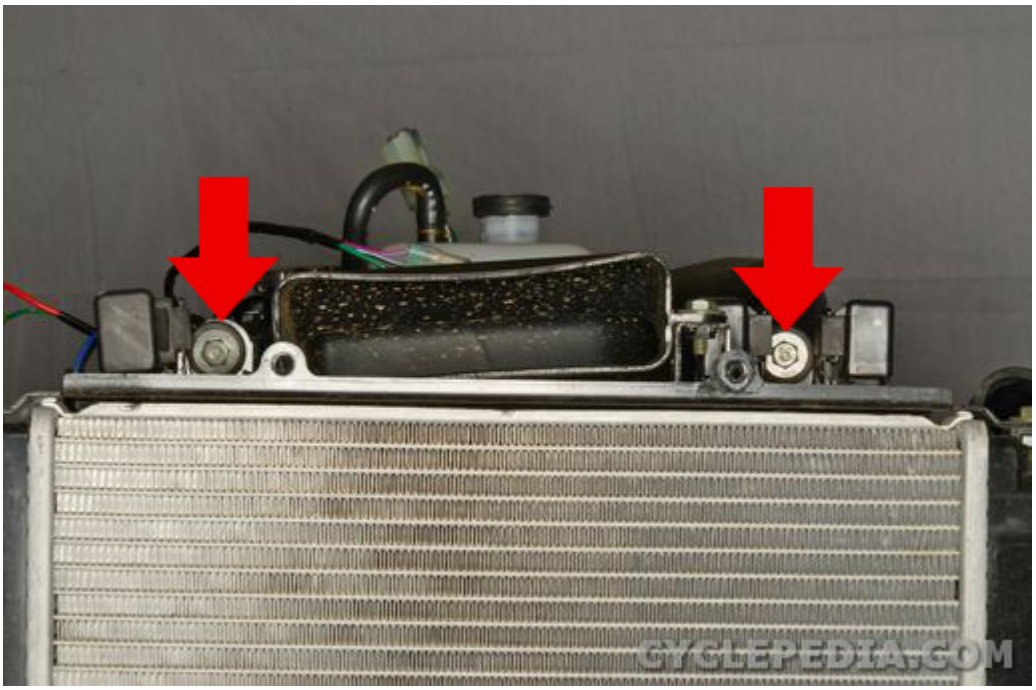
Installation



Install the upper and lower radiator mounting brackets and tighten the corner bolts securely. Install the radiator fan and tighten the nuts securely.

Fit the radiator into place.

Guide the studs on the bottom radiator mounting bracket into the rubber grommets.



Install the two radiator mounting bracket to frame bolts. Return the three relays to their mounts on the upper radiator mounting bracket.

Install the two upper and two lower radiator cowling bolts and tighten them securely.

Plug in the radiator fan connector.

The MXU 700i radiator has three hoses; a water pump hose (lower right), a filler neck hose (upper right), and a thermostat hose (upper left). The MXU 500 also has an air bleed hose that connects to the radiator. Connect the radiator hoses and tighten the clamps securely.

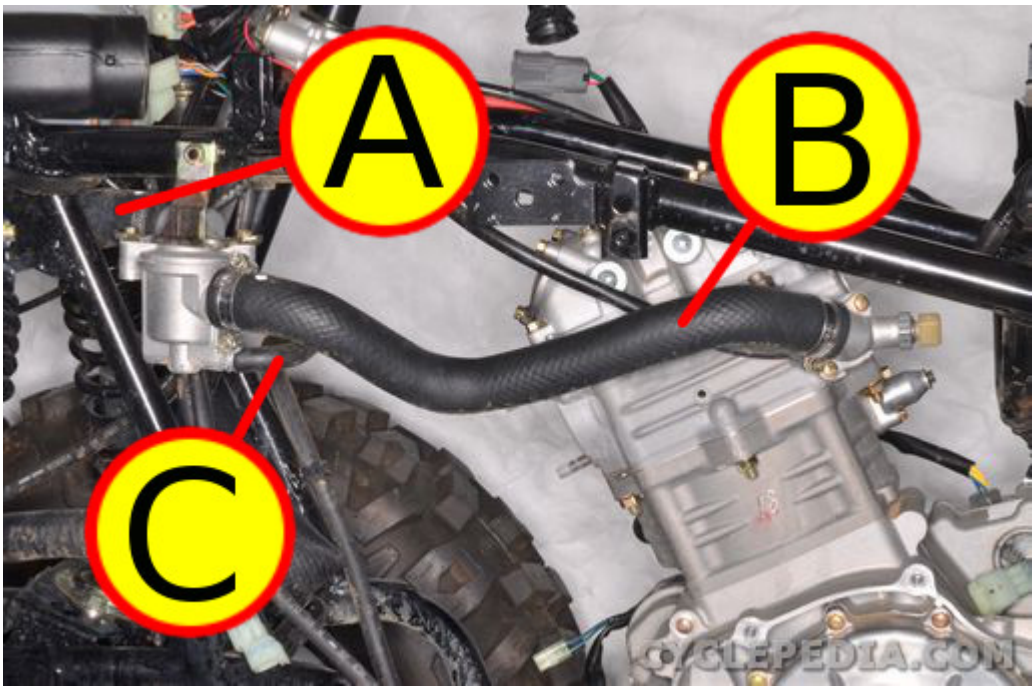
Install these components	
Component	Topic
Front bumper	Front Bumper
Upper front cooling duct for the CVT	CVT Cooling Ducts
Fuel tank	Fuel Tank
Fill the coolant	Coolant
Front fender	Front Fender
Front cover	Front Cover
Front rack	Racks
Mudguards	Mudguards and Footrests
Side covers	Side Covers
Seat	Seat

Thermostat

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Front rack	Racks
Seat	Seat
Front cover	Front Cover
Side covers	Side Covers
Fuel tank cover	Fuel Tank
Front mudguard fasteners	Mudguards and Footrests
Front fender	Front Fender
Drain the coolant	Coolant

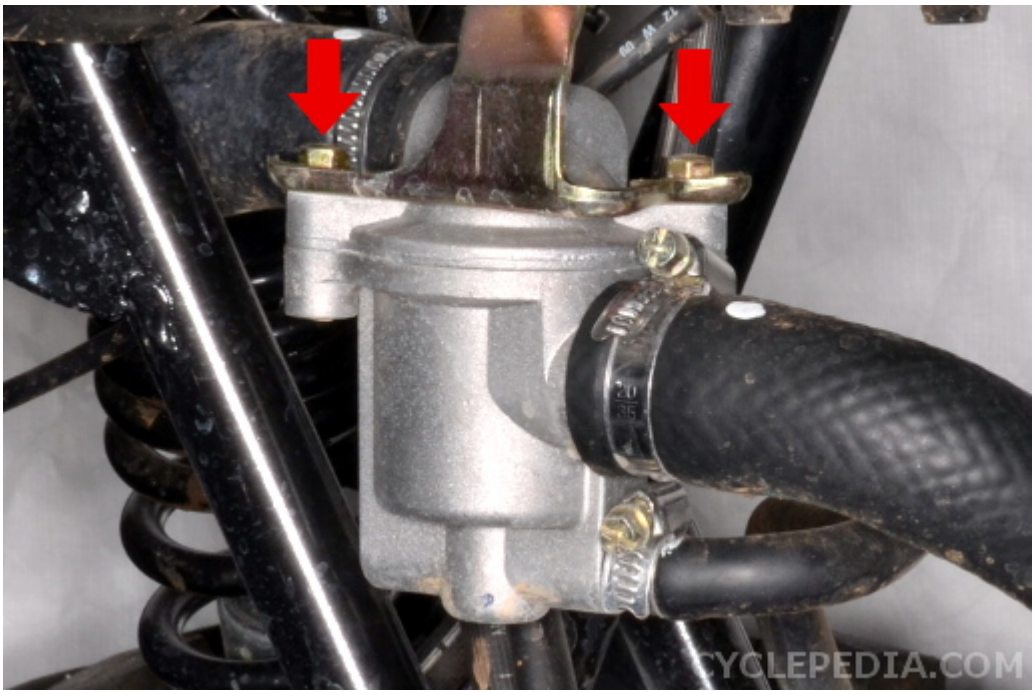


The thermostat is connected to three coolant hoses.

A. Upper Radiator Coolant Hose (Left Side)

B. Cylinder Head Hose

C. Bypass Hose (Water Pump)



Remove the thermostat housing bolts with an 8 mm socket.

Separate the housing cover from the thermostat housing.

Remove the O-ring from the housing cover.

Remove the thermostat.

Inspection

Inspect the thermostat valve at room temperature, if the valve is open the thermostat is defective and needs to be replaced. Also, replace the thermostat if its seal ring is in poor condition.

To check the thermostat opening temperature, fill a pan with tap water and suspend the thermostat with a piece of wire, completely immersing it in the water making sure the thermostat does not touch the pan.

Place a thermometer in the pan and heat the water on a burner. Gently stir the water and notice what the temperature is when the thermostat starts to open.

Thermostat	Begin to open	69 - 73°C (156 - 163°F)
	Fully open	85°C (185°F)
	Valve lift	8 mm (0.3 in) minimum

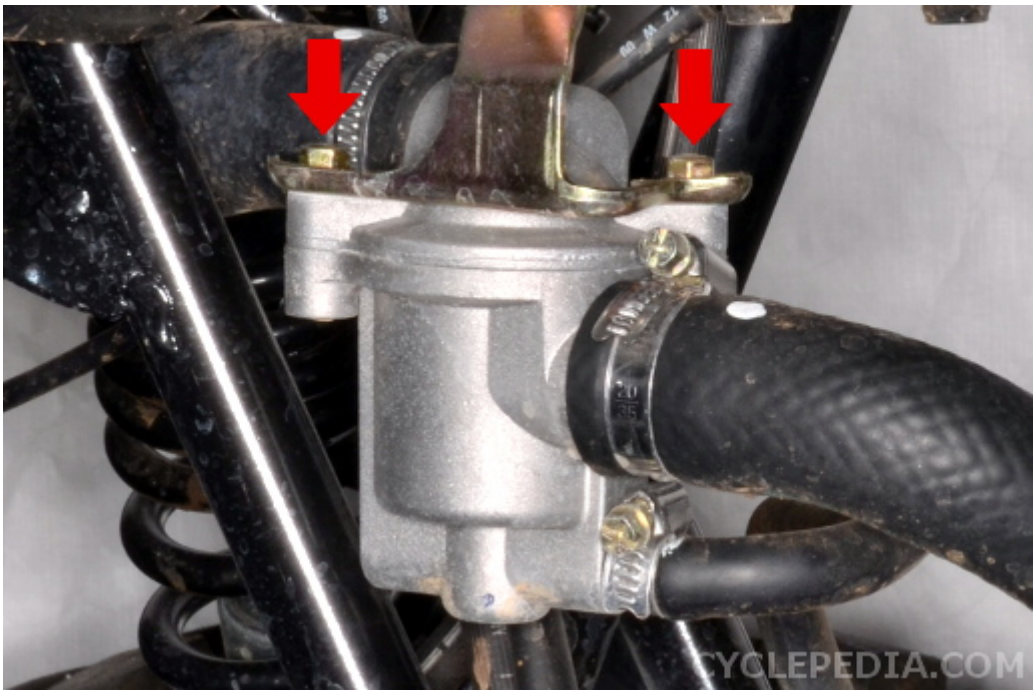
Remove the thermostat from the heated water. The thermostat should close at room temperature.

Installation

Install the thermostat so its air bleed hole faces up and aligns with the tab in the housing.

Install a new O-ring in the housing cover.

Join the housing cover with the thermostat housing.



Install the thermostat housing bolts and tighten them securely with an 8 mm socket.

Fill the coolant if necessary. See the Coolant topic for more information.

Install the inner fender. See the Inner Fender topic for more information.

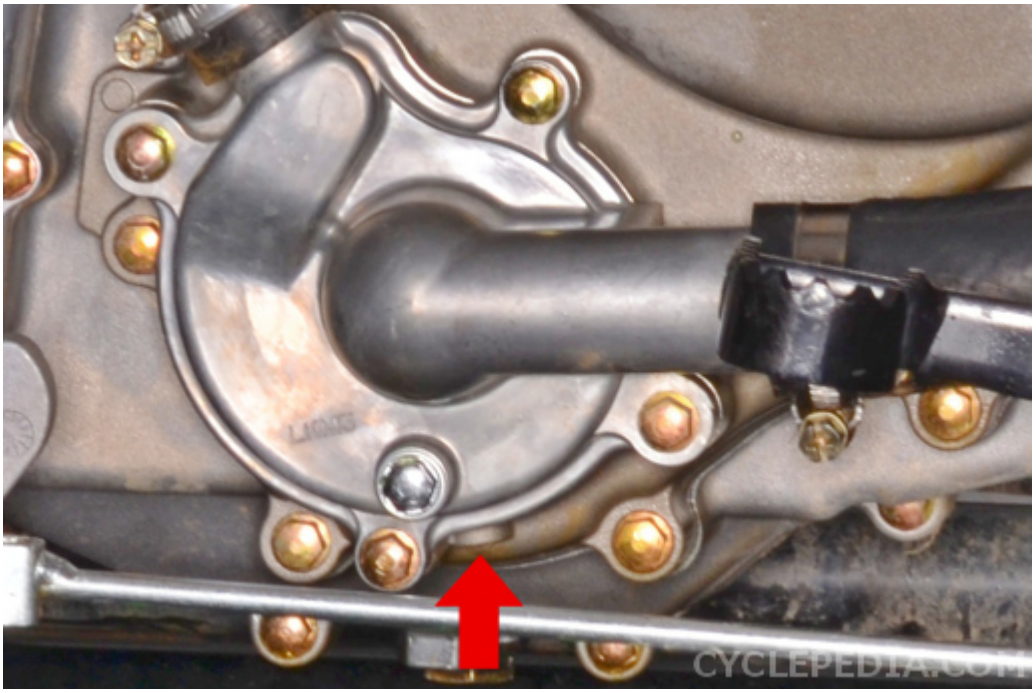
Water Pump

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

MXU 700i

Mechanical Seal Inspection

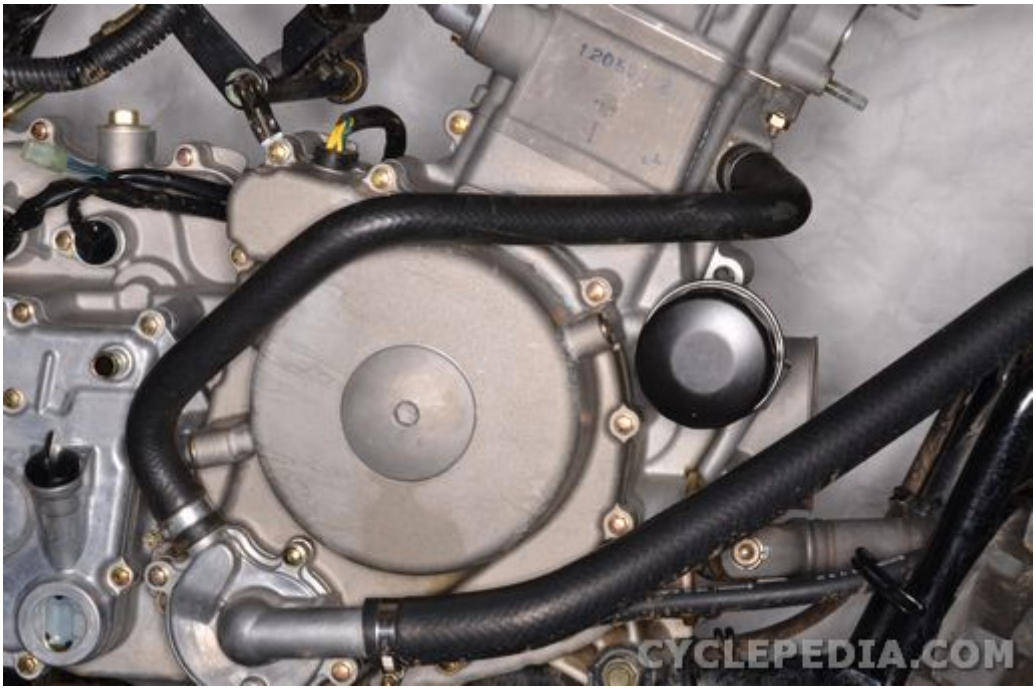
Remove the right mudguard. See the Mudguards and Footrests topic for more information.



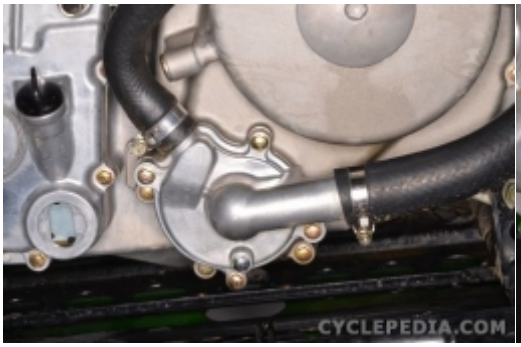
Inspect the telltale hole in the water pump cover for signs of coolant leaking. If there is coolant coming from this hole the mechanical seal is compromised and the seal must be replaced.

Water Pump Cover Removal

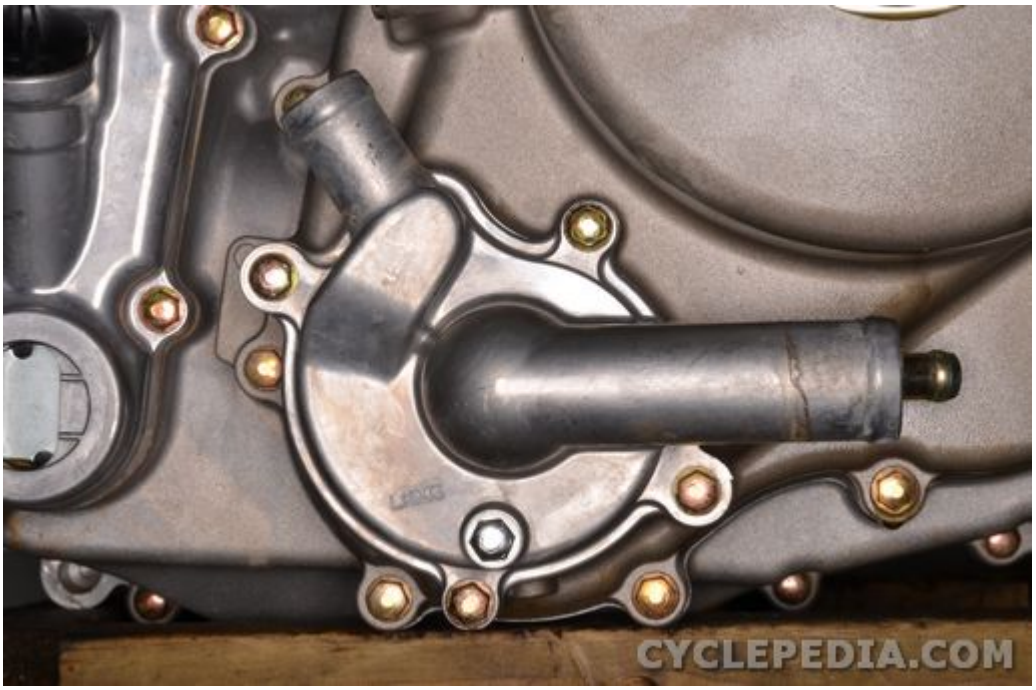
Remove these components	
Component	Topic
Side covers	Side Covers
Right mudguard	Mudguards and Footrests
Drain the coolant	Coolant

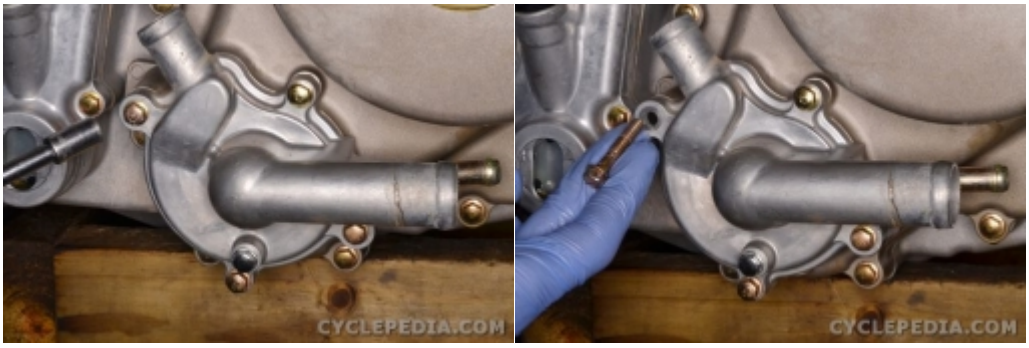


Loosen the water pump to cylinder coolant hose clamp with a #2 Phillips screwdriver. Free the cylinder coolant hose from the water pump.



Loosen the bypass (smaller) and lower radiator hose (larger) clamp with a #2 Phillips screwdriver. Free the hoses from the water pump.





Remove the four water pump cover screws with an 8 mm socket.

Remove the water pump cover.

Inspect the cover O-ring and replace it as needed.

Remove the dowel pins.

Impeller Removal

Remove these components	
Component	Topic
Side covers	Side Covers
Mudguard	Mudguards and Footrests
Drain the engine oil	Engine Oil
Generator cover	Generator Cover

The impeller shaft is secured with a snap ring on the inside of the generator cover.

Spread the snap ring with snap ring pliers and slide it off the shaft. Remove the washer.

Remove the water pump impeller from the generator cover.

Remove the outer part of the mechanical seal.

Remove the mechanical seal from the water pump cover.

If the mechanical seal is difficult to remove us the following procedure.

A. Tap the tip of a small sheet metal screw into the inner-metal edge of the seal.

B. Grip the screw with a pair of vise-grip pliers and pull the seal out.

Remove the oil seal.

Lubricate the lips of the new oil seal with grease. Drive the new oil seal into place as shown with a suitable driver that is the same outside diameter as the seal.

Apply coolant to the new mechanical seal.

Drive the new mechanical seal into place by its outside diameter. Make sure the seal is fully seated.

Impeller Installation

Install the outer part of the mechanical onto the impeller as shown.

Insert the impeller into the seals and generator cover.

Place the washer over the inside end of the impeller shaft.

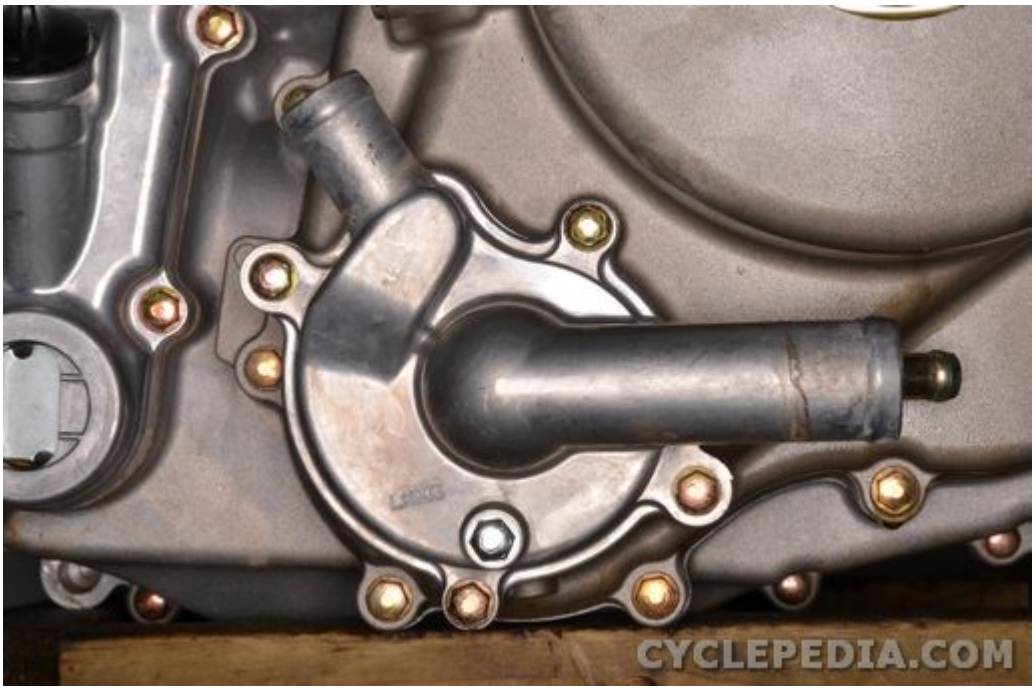
Spread the snap ring with snap ring pliers and slide it onto the shaft and into the groove.

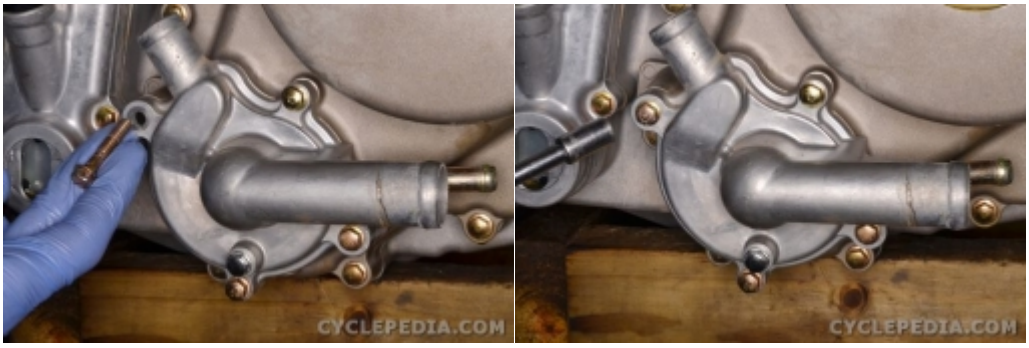
Water Pump Cover

Install the two water pump cover dowel pins.

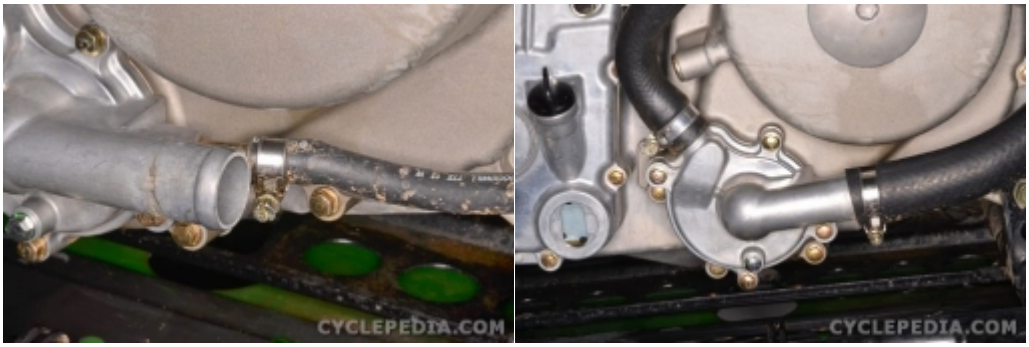
Make sure the water pump cover O-ring seal is in good condition.

Install the water pump cover.

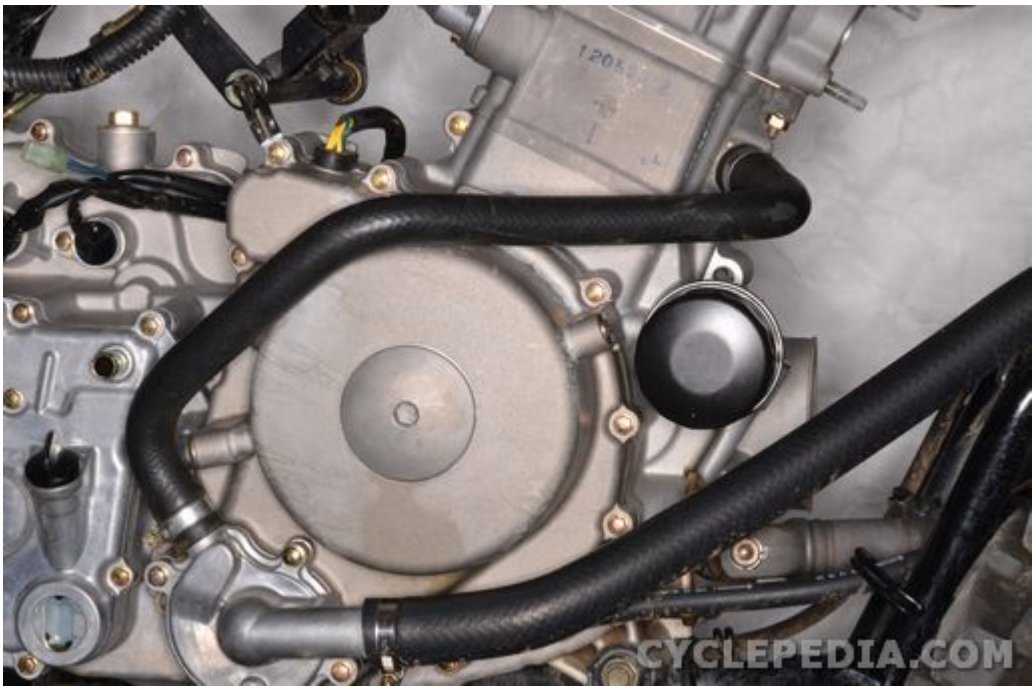




Install the four water pump cover screws and tighten them securely with an 8 mm socket.



Connect the bypass hose (smaller) and lower radiator hose (larger) to the water pump. Install the clamps. Tighten the clamps securely with a #2 Phillips screwdriver.



Connect the cylinder coolant hose to the water pump. Install the hose clamp and tighten it securely with a #2 Phillips screwdriver.

Fill the engine oil. See the Engine Oil topic for more information.

Fill the coolant and bleed the cooling system. See the Coolant topic for more information.

MXU 500i

Mechanical Seal Inspection

Remove the right mudguard. See the Mudguards and Footrests topic for more information.

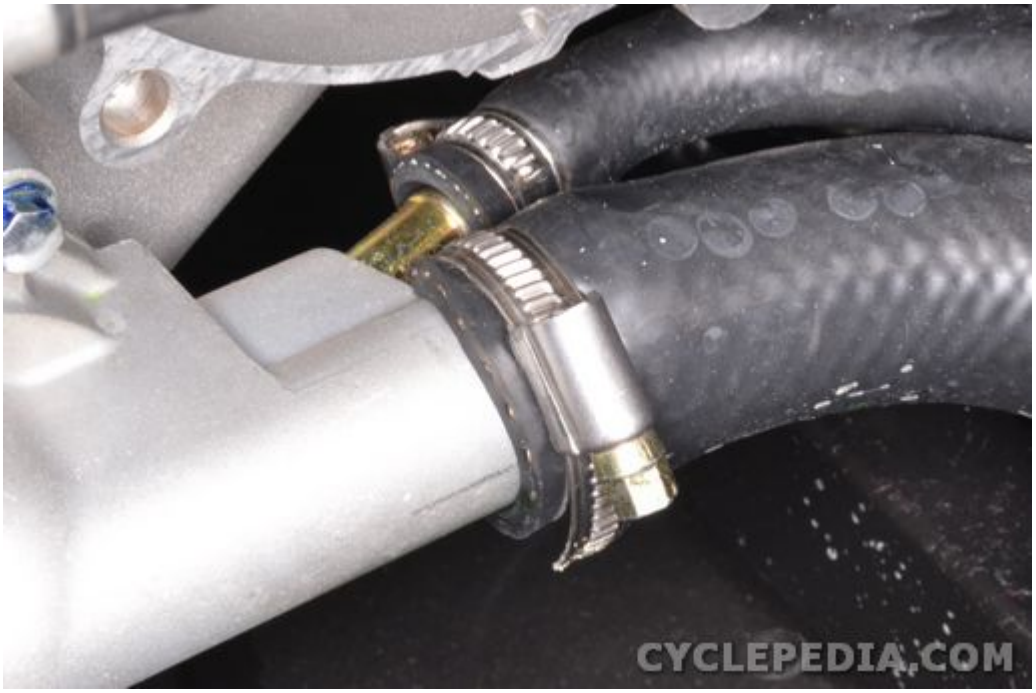
Inspect the telltale hole in the water pump cover for signs of coolant leaking. If there is coolant coming from this hole the mechanical seal is compromised and the water pump must be replaced.

Removal

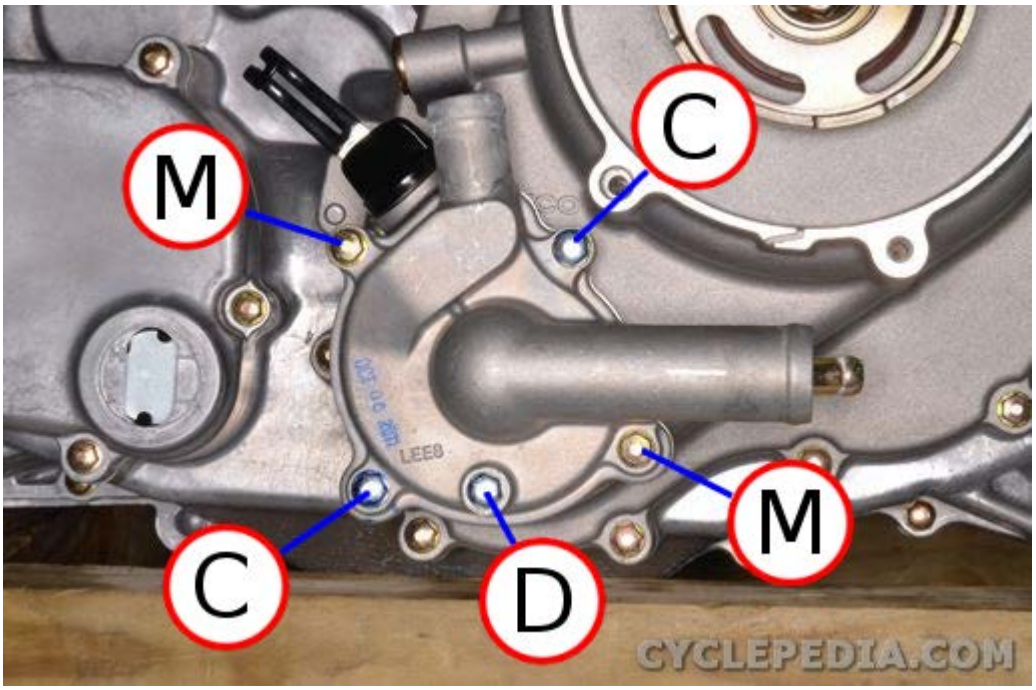
Drain the coolant. See the Coolant topic for more information.

Drain the engine oil if the water pump is to be removed. See the Engine Oil topic for more information.

Loosen the water pump to cylinder coolant hose clamp with a #2 Phillips screwdriver. Free the cylinder coolant hose fro the water pump.



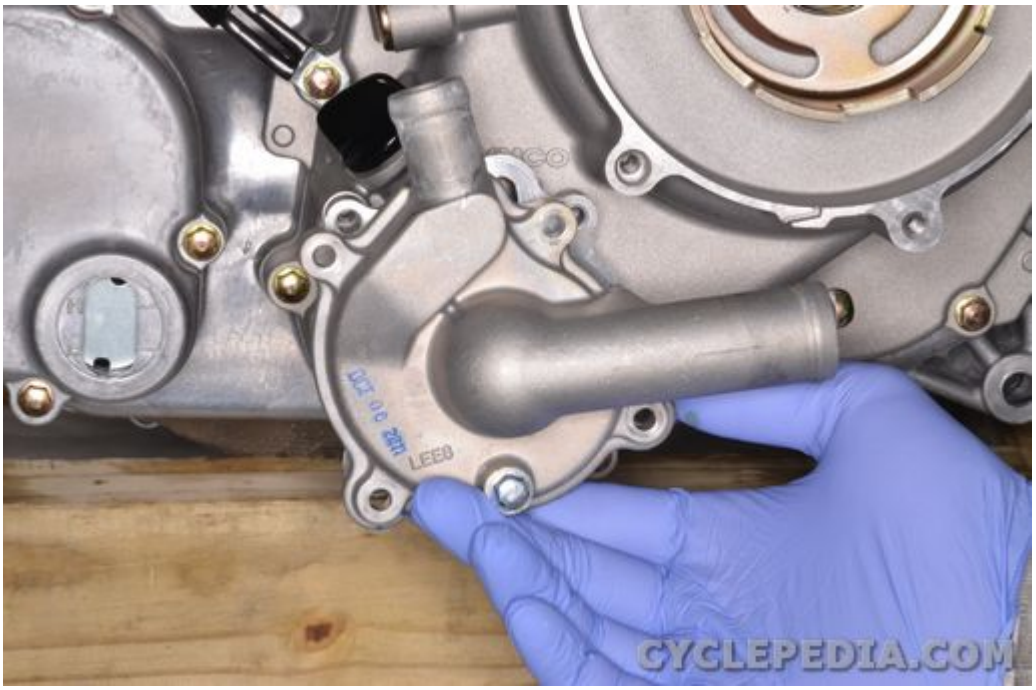
Loosen the bypass (smaller) and lower radiator hose (larger) clamp with a #2 Phillips screwdriver. Free the hoses from the water pump.



The water pump has two mounting bolts (M), two cover bolts (C), and a drain bolt (D). Go ahead and loosen the cover bolts while the water pump is installed if the cover is to be removed. Do not remove the cover unless necessary.

The mounting bolts are gold colored and longer than the silver cover bolts.

Remove the water pump bolts with an 8 mm socket.



Remove the water pump cover.

Remove the water pump O-ring and discard it.

Remove the water pump body from the engine.

Discard the water pump body O-ring. Replace it with a new item on installation.
Turn the water pump shaft and make sure it turns smoothly without binding.

Inspect the water pump impeller. Replace the water pump as a whole if the impeller or shaft is damaged.

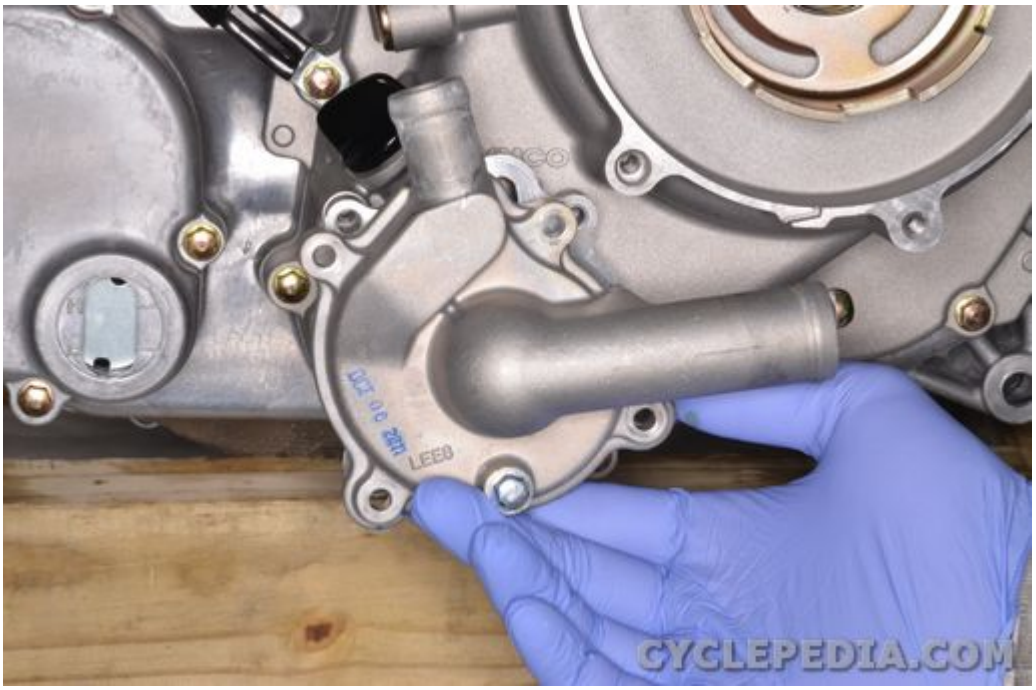
Installation

Install a new O-ring to the water pump body. Apply fresh engine oil to the O-ring.

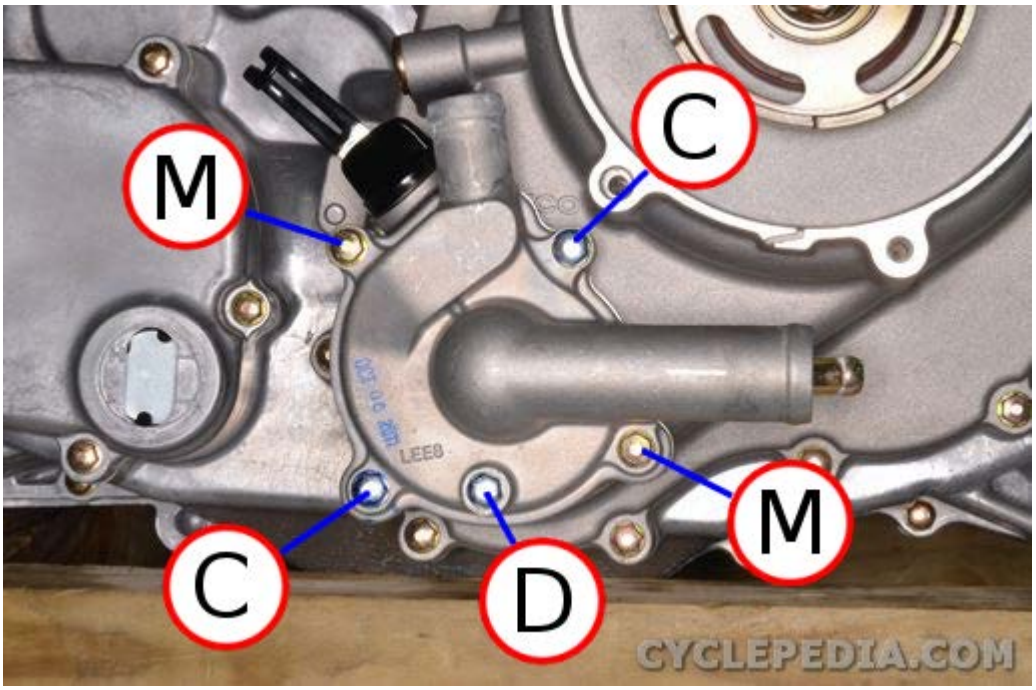
Fit the water pump body into place.

Guide the water pump shaft groove onto the end of the oil pump shaft.

Install a new O-ring into the groove on the water pump cover.



Fit the water pump cover into place.

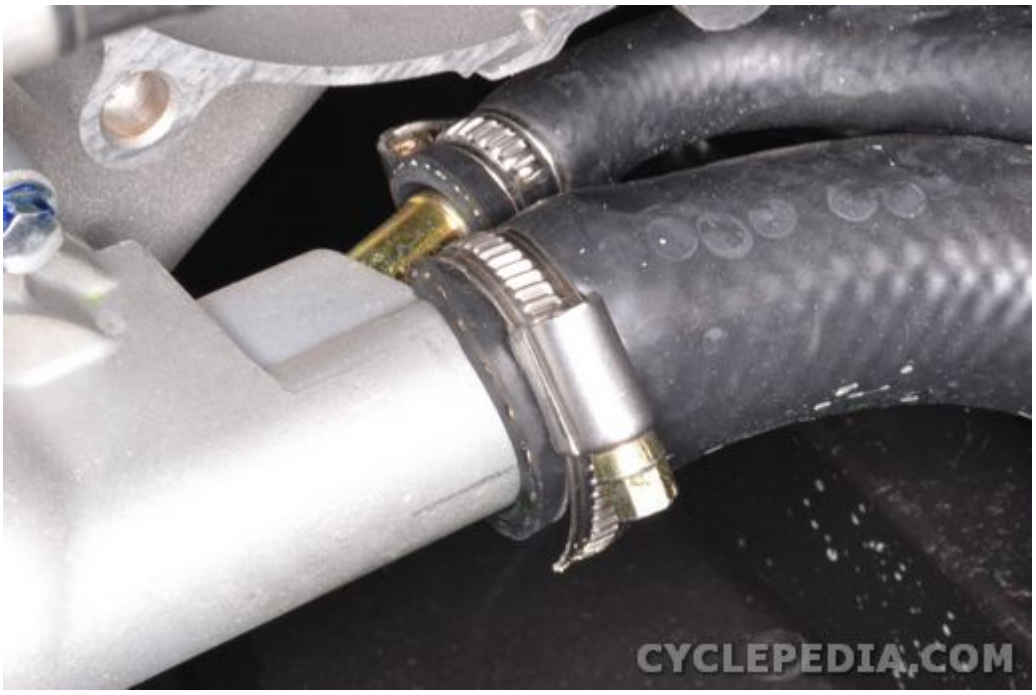


The water pump has two mounting bolts (M), two cover bolts (C), and a drain bolt (D). Install the mounting bolts before the cover bolts.

Install the water pump mounting bolts and cover bolts. The mounting bolts are gold colored and longer than the silver cover bolts.

Tighten the water pump bolts to specification with an 8 mm socket.

ITEM	N-m	kgf-m	ft-lb
Water pump bolt	13	1.3	9



Connect the bypass hose (smaller) and lower radiator hose (larger) to the water pump. Install the clamps. Tighten the clamps securely with a #2 Phillips screwdriver.

Connect the cylinder coolant hose to the water pump. Install the hose clamp and tighten it securely with a #2 Phillips screwdriver.

Fill the engine oil. See the Engine Oil topic for more information.

Fill the coolant and bleed the cooling system. See the Coolant topic for more information.

7. CVT Continuously Variable Transmission

MXU500i

This chapter covers the location and servicing of the CVT components for the KYMCO MXU 500i models.

1.Cooling Ducts 7-3
2.Belt Case Cover 7-11
3.CVT Removal 7-20
4.CVT Installation 7-36
5.Clutch Removal 7-52
6.Clutch Installation 7-68

CVT Components Diagram

CVT Components Diagram

GENERAL INSTRUCTIONS

• The drive pulley, clutch and driven pulley can be serviced with the engine installed.

• Avoid getting grease and oil on the drive belt and pulley faces. Remove any oil or grease from them to minimize the slipping of drive belt and drive pulley.

TROUBLESHOOTING

Engine starts but vehicle won't move

• Worn drive belt
• Broken ramp plate
• Worn or damaged clutch lining
• Broken driven face spring

Engine stalls or vehicle creeps

• Broken clutch weight spring

Lack of power

• Worn drive belt
• Weak driven face spring
• Worn weight roller
• Faulty driven face

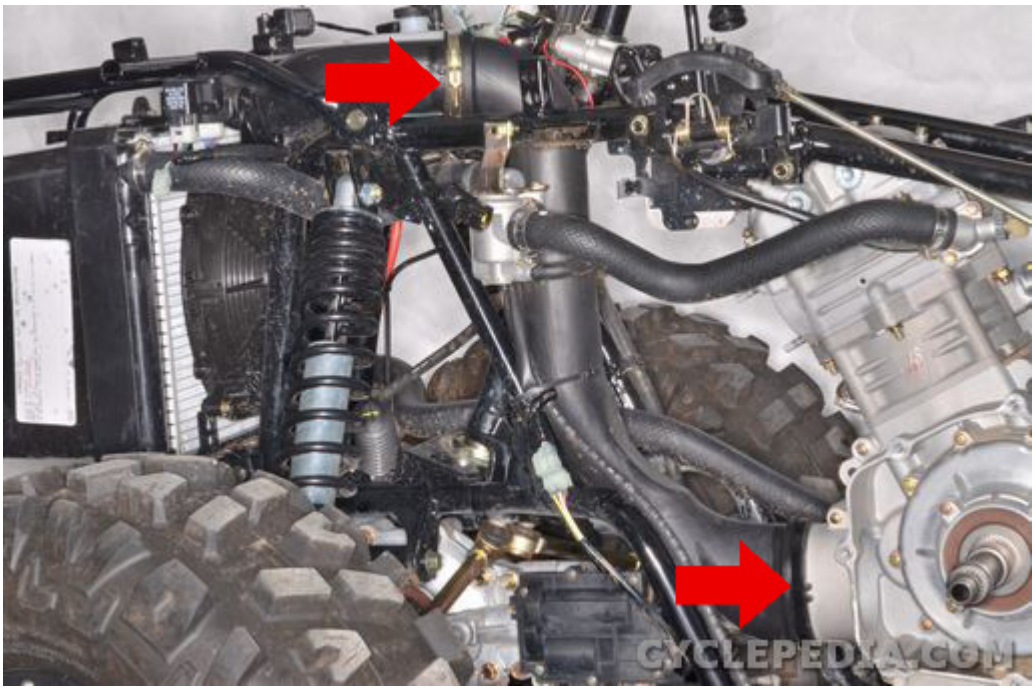
CVT Cooling Ducts

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

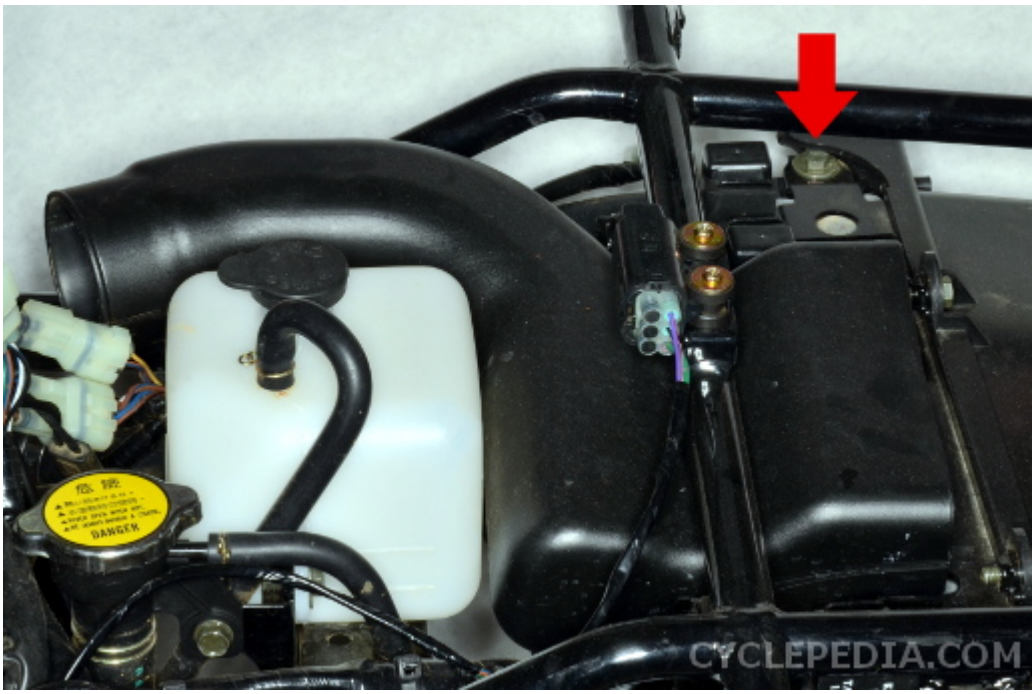
Removal

Front

Remove these components	
Component	Topic
Front rack	Racks
Seat	Seat
Front cover	Front Cover
Side covers	Side Covers
Fuel tank cover	Fuel Tank
Front mudguard fasteners	Mudguards and Footrests



The lower front cooling duct is held to the upper duct and belt case with clamps. Loosen the clamp screws with a #2 Phillips screwdriver. Free the lower front cooling duct from the upper duct and belt case.



To remove the upper front cooling duct remove the bolt with a 10 mm socket.

Rear

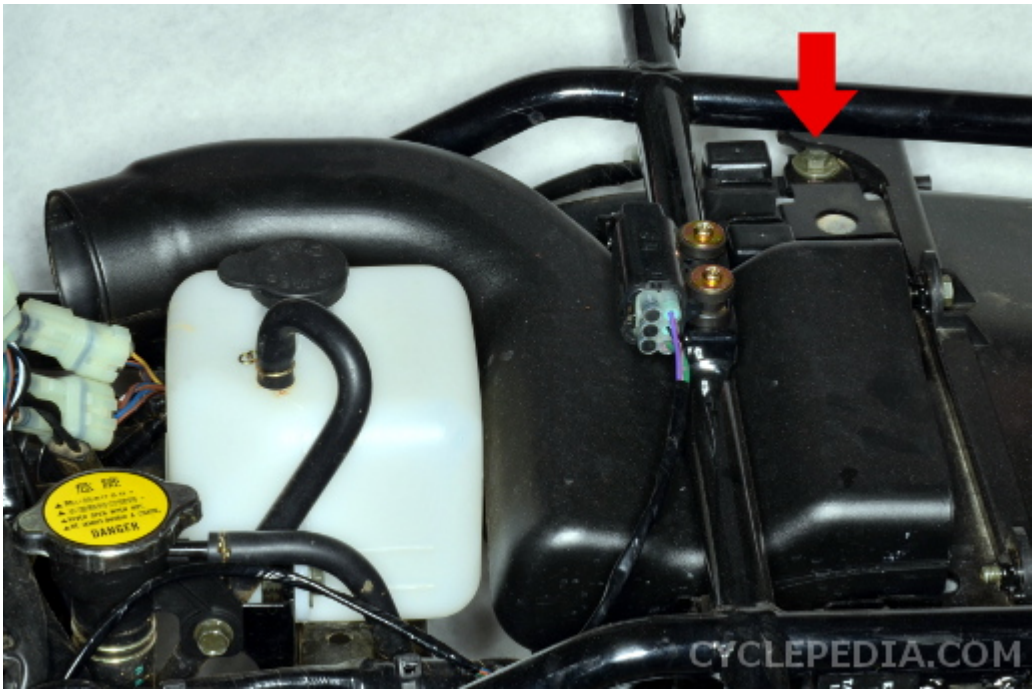
Remove these components	
Component	Topic
Rear rack	Racks
Seat	Seat
Right mudguard	Mudguards and Footrests
Side covers	Side Covers
Battery	Battery
Rear Fender	Rear Fender

Loosen the clamp with a #2 Phillips screwdriver. Free the cooling duct from the CVT case.

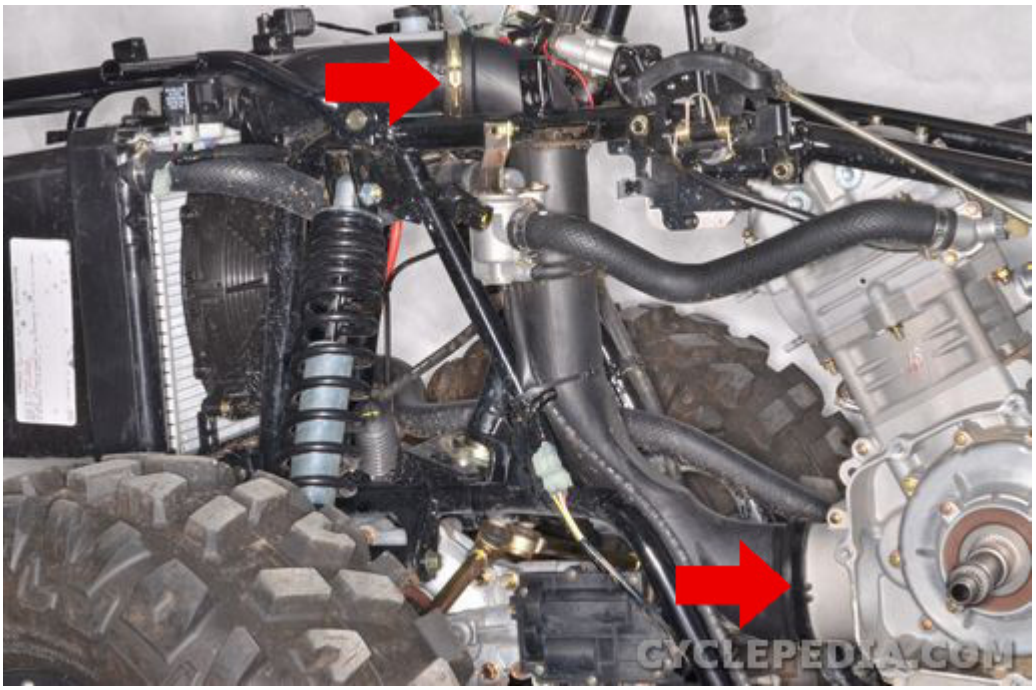
Loosen the clamp and remove the lower cooling duct from the upper. Remove the two bolts to remove the upper cooling duct.

Installation

Front



Install the upper front cooling duct into place. Insert the bolt and tighten it securely with a 10 mm socket.



Connect the lower front cooling to the upper duct and belt case.

Install the clamps and tighten them securely with a #2 Phillips screwdriver.

Install these components	
Component	Topic
Front fender	Front Fender

Front mudguard fasteners	Mudguards and Footrests
Fuel tank cover	Fuel Tank
Side covers	Side Covers
Front cover	Front Cover
Seat	Seat
Front rack	Racks

Rear

Fit the rear upper cooling duct into place and install the two bolts. Install the lower cooling duct to the upper.

Tighten the clamps securely with a #2 Phillips screwdriver.

Install these components	
Component	Topic
Rear fender	Rear Fender
Battery	Battery
Side covers	Side Covers
Mudguards	Mudguards and Footrests
Seat	Seat
Rear rack	Racks

Belt Case Cover

MXU500i

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Drain Bolt

There is a drain bolt on the bottom of the belt case. If this bolt is removed and any fluid comes out the CVT belt and pulleys should be inspected. Return the bolt with a new sealing washer and tighten it securely.

Removal

Remove the left footrest/mudguard. See the Mudguards and Footrests topic for more information.

There are 10 belt case cover bolts.

Loosen the belt case cover bolts with an 8 mm socket.

Remove the bolts and their rubber grommets.

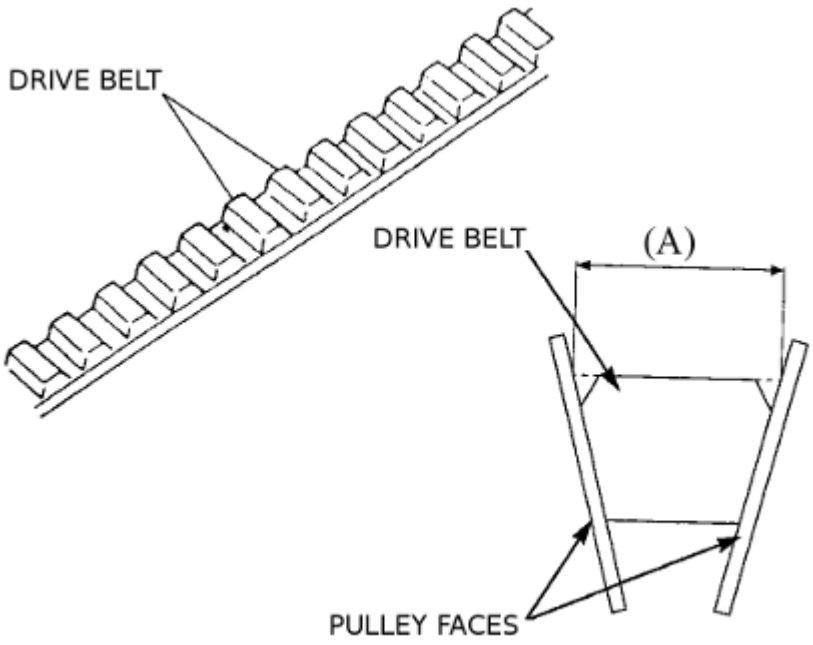
Utilize the pry points and remove the belt case cover.

Remove the belt case cover rubber gasket.

Remove the two belt case cover dowel pins.

Inspection

Inspect the drive belt for cracks or excessive wear.



Measure the distance between the pulley faces at the top of the belt as indicated (A).

Item	Standard mm (in)	Service Limit
Drive belt width	34.1 (1.364)	30.8 (1.232)

Replace the belt if it shows signs of damage or is out of specification. See the CVT Removal topic.

Installation

Install the two dowel pins into the belt case.

Make sure the CVT belt case cover rubber gasket is in good condition.

Install the CVT belt case cover rubber gasket.

Install the belt case bolts with their gaskets.

Install the wire clamp with the belt case bolt as shown. Tighten the bolts evenly in a crisscross pattern.

Torque the belt case cover bolts to specification with an 8 mm socket.

ITEM	N-m	kgf-m	ft-lb
Belt case cover bolt	10	1.0	7.2

Install the left footrest/mudguard. See the Mudguards and Footrests topic for more information.

CVT Removal

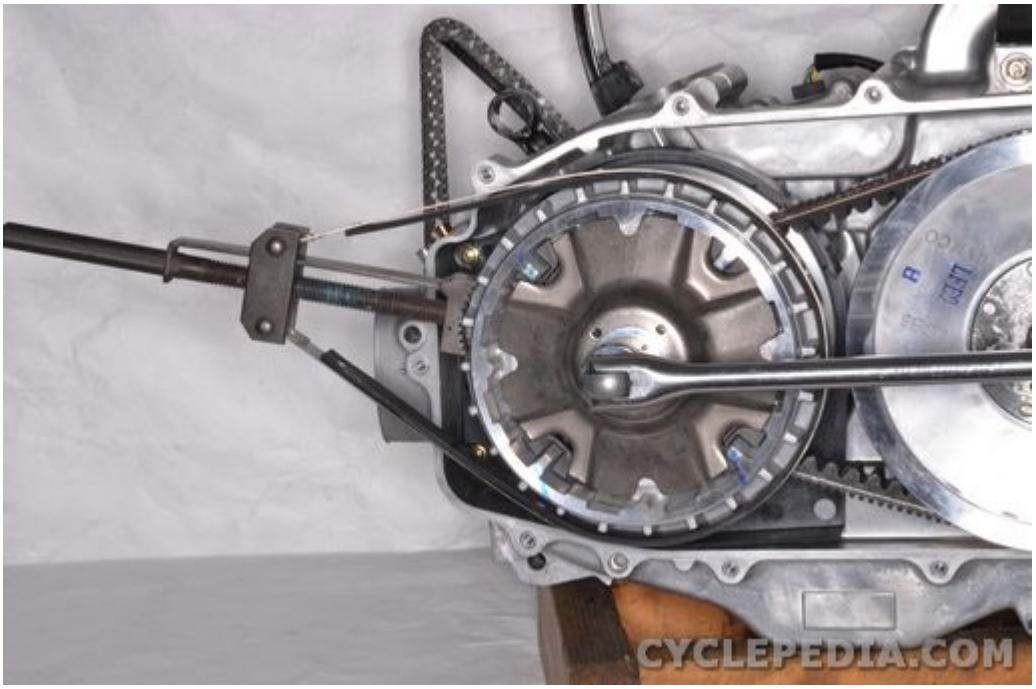
MXU500i

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Remove the belt case. See the Belt Case topic for more information.

Note: Do not contaminate the CVT belt and pulley faces with grease or oil.

Pulleys and Belt



Hold the drive pulley with a drive pulley holder tool and loosen the nut with a 26 mm socket.
Special Tool -

Drive Pulley Holder: A120E00058

Remove the drive pulley nut and washer from the drive pulley shaft.

Slide the movable drive face of the drive pulley off of the drive pulley shaft.

Hold the driven pulley with a Y-type holder and loosen the driven pulley nut with a 22 mm socket.

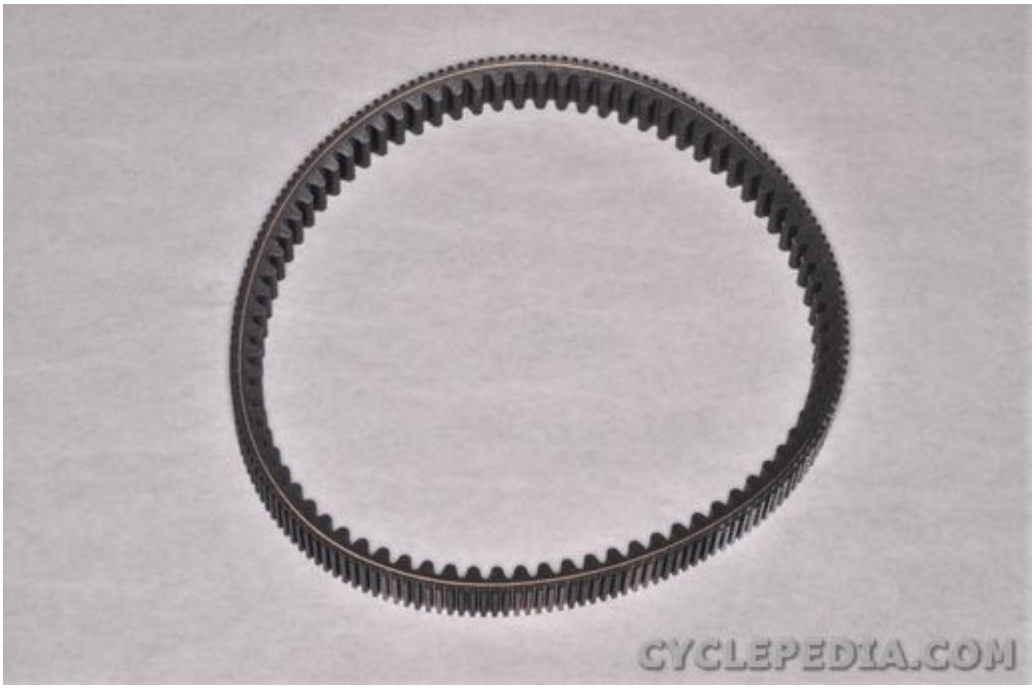
Special Tool -
Y-Type Holder: A120E00056

Remove the driven pulley nut.

Remove the driven pulley and CVT belt.

Remove the washer from the driven pulley shaft.

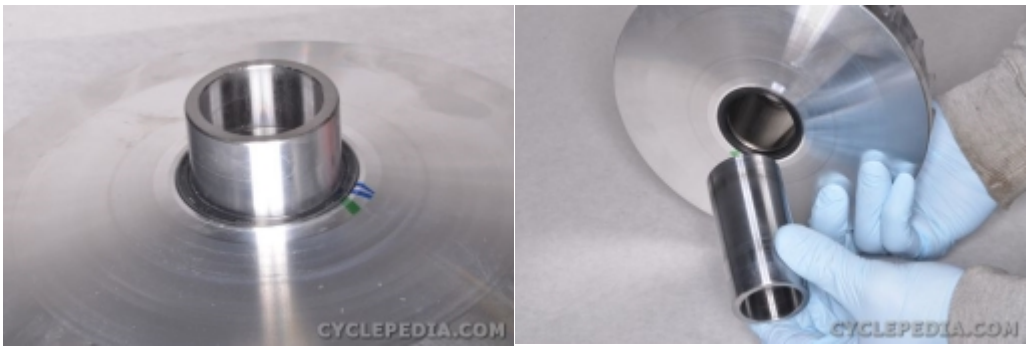
Remove the drive belt from the driven pulley.



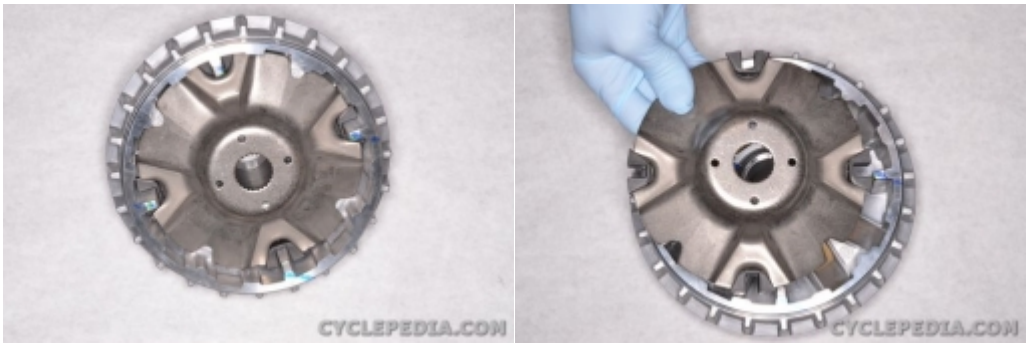
Inspect the drive belt for cracks or excessive wear.

Slide off the fixed drive face of the drive pulley.

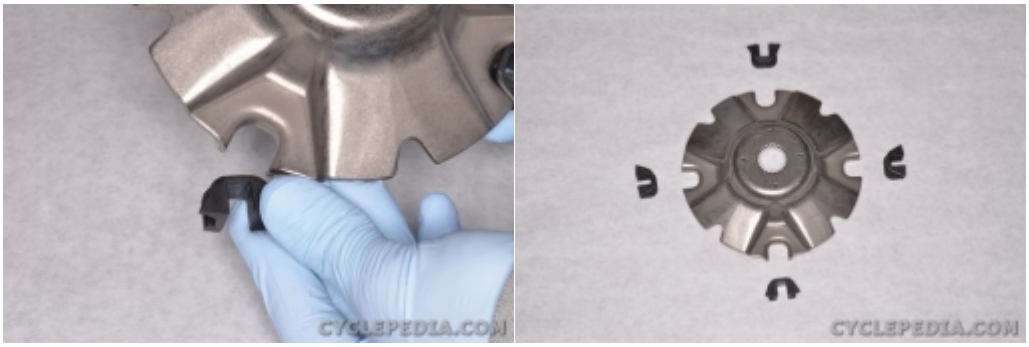
Drive Pulley Disassembly



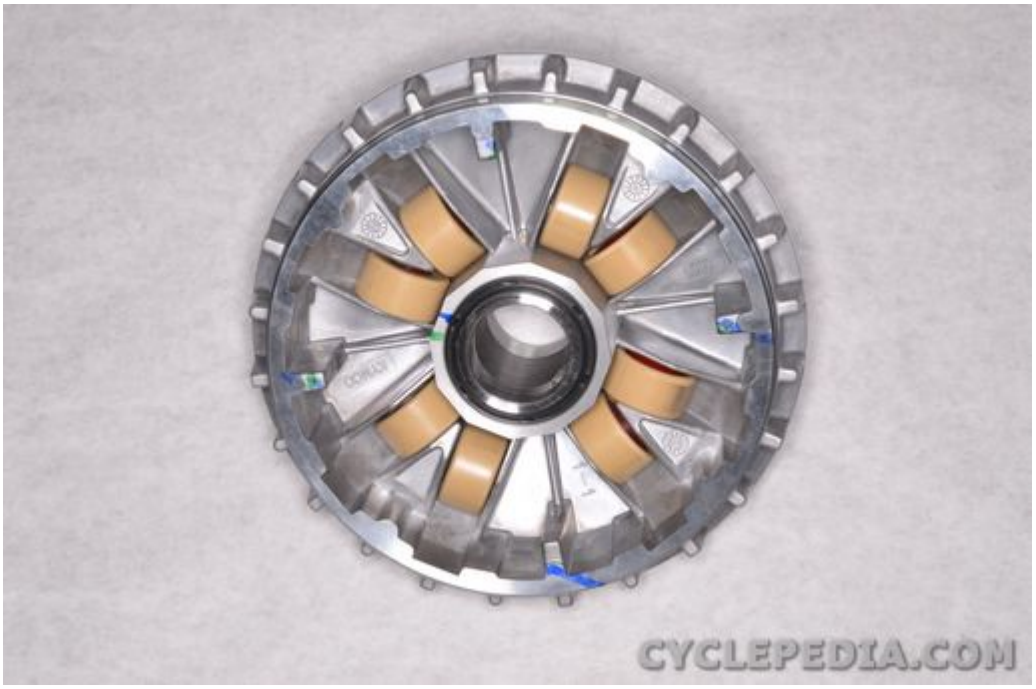
Remove the boss from the movable drive face of the drive pulley.



Lift the ramp plate out of the back of the movable drive pulley face.

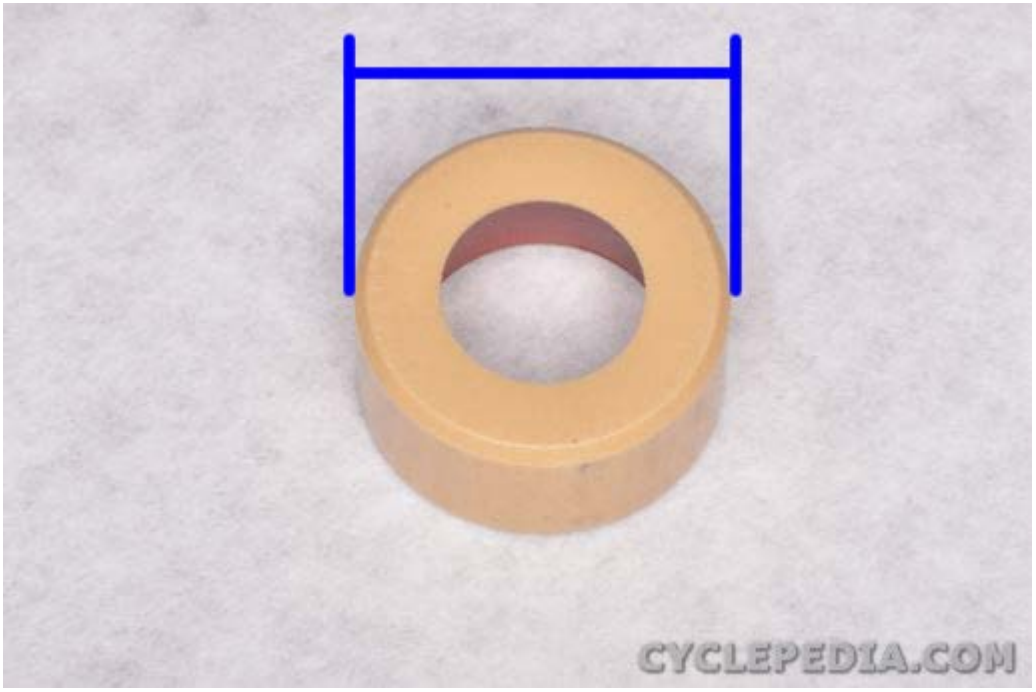


Remove the rubber damper pieces from the ramp. Replace the dampers if they are in poor condition.



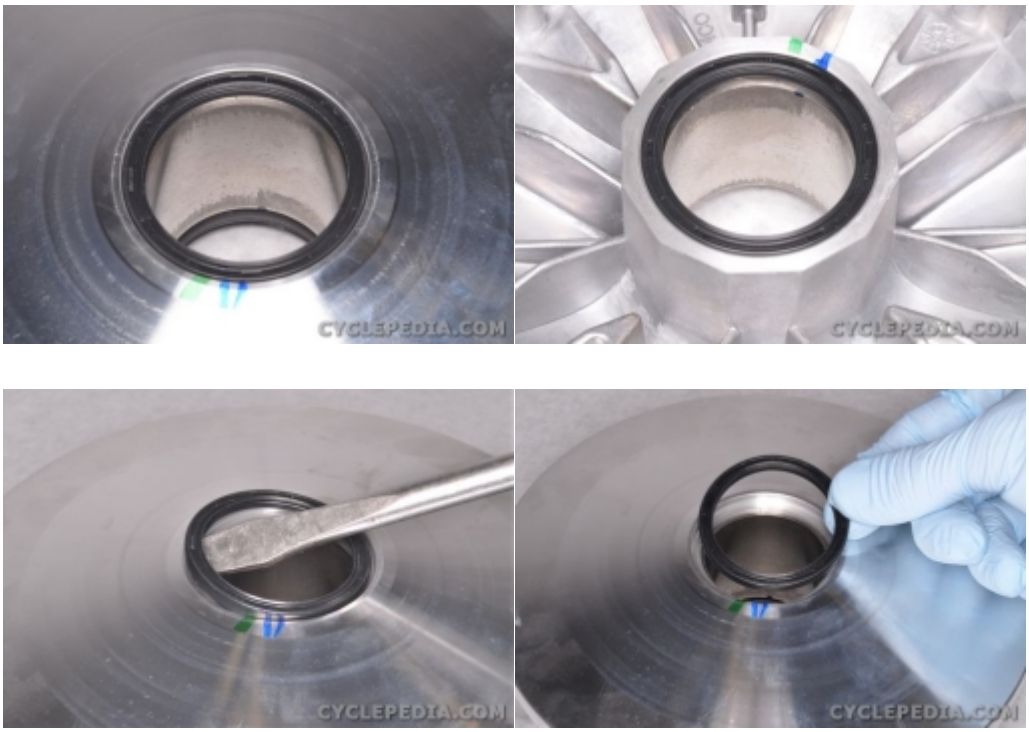
There are eight weight rollers in the back of the right face of the drive pulley.

Remove the rollers and check them for excessive or uneven wear.



Measure the outside diameter of the rollers. Replace the weight rollers as needed.

Item	Standard mm (in)	Service Limit
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)



Remove the dust seals.

Inspect the faces of the drive pulley. Clean away any grease from drive pulley components.

Driven Pulley Disassembly

A driven pulley spring compressor is needed to disassembly the driven pulley.

Special Tool -
Driven Pulley Spring Compressor: A120E00059

Fit the driven pulley onto the special tool. Fit the posts on the tool into the holes as shown.

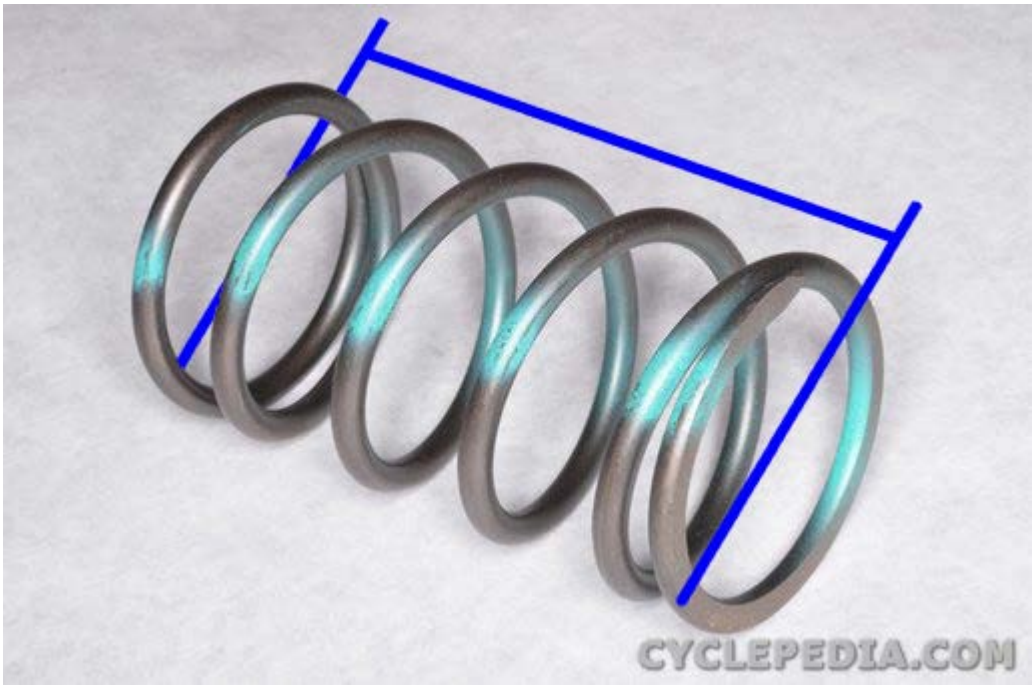
Place the special tool in a vise. Note the wrench of the special tool. Turn in the nut to compress the spring. The nut must have enough room to come free.

Loosen the nut with the wrench part of the special tool.

Remove the special tool components and the nut.

Remove the spring seat.

Lift off the spring.



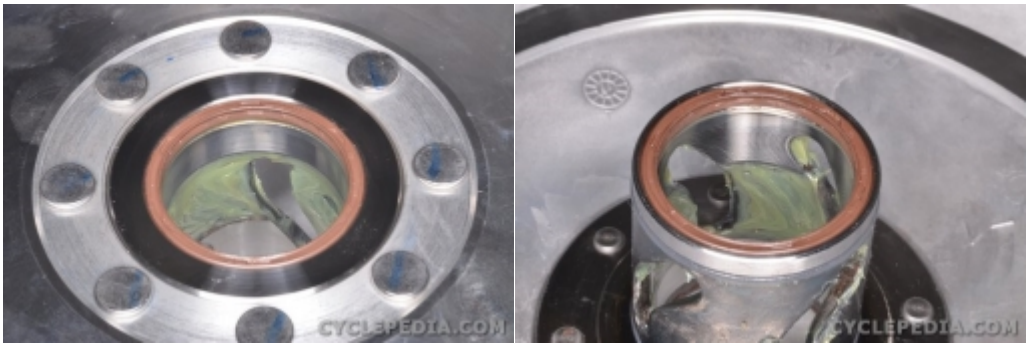
Measure the free length of the spring. Replace the spring if it is out of specification.

Item	Standard mm (in)	Service Limit
Driven pulley spring	124.3 (4.972)	121.3 (4.852)

Slide off the spring collar.

Remove the four guide rollers with guide roller pins.

Separate the fixed and movable faces of the driven pulley. Inspect the faces of the driven pulley. Clean away any grease from the faces where the belt rides.



Remove the O-rings and seals from the movable face of the driven pulley.

Clean the driven pulley components with a high flash point solvent and compressed air. Remove all of the old grease.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

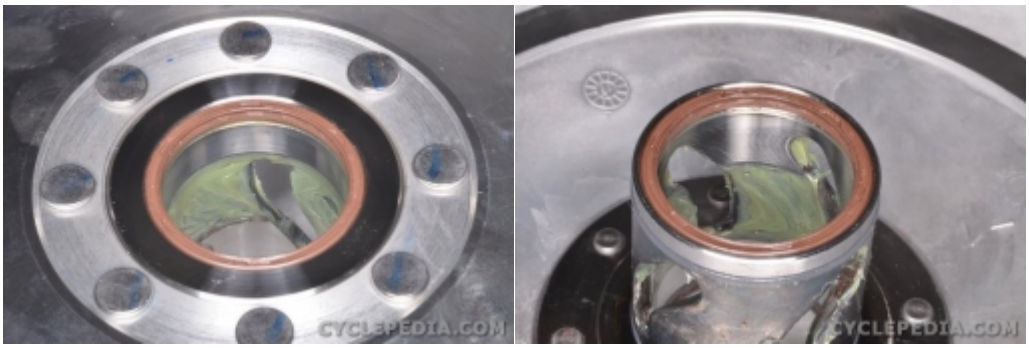
To install the CVT see the CVT Installation topic.

CVT Installation

MXU500i

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Driven Pulley



Install a new O-rings and dust seals into the movable face of the driven pulley. Drive in the new seals with a suitable driver with the same outside diameter as the seal. Coat the O-rings, seals, and inside of the movable face where it rides on the fixed face with grease.

Fit the movable driven face onto the fixed driven face. Wipe away any grease that gets on the faces where the belt will ride.

Lubricate the guide pins and rollers with grease. Place the rollers on the pins and insert the pins into driven pulley. Make sure the movable drive face moves smoothly in and out on the fixed face.

Install the spring collar.

Install the spring.

Install the spring seat.

Place the nut over the spring seat.

Fit the driven pulley onto the special tool. Fit the posts on the tool into the holes as shown.

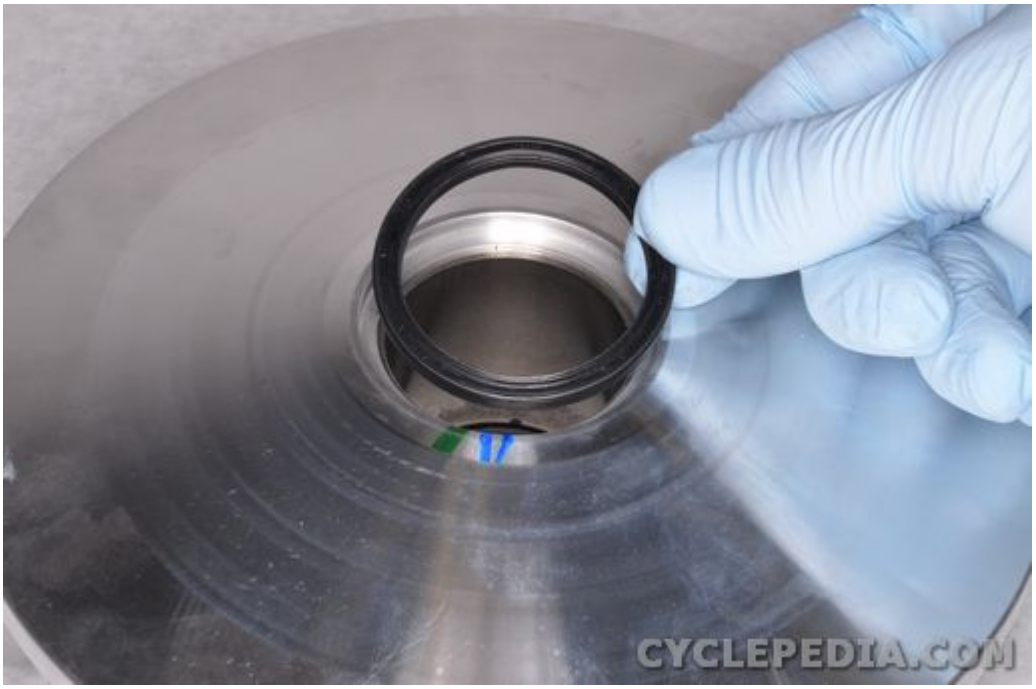
Special Tool - Driven Pulley Spring Compressor: A120E00059

Place the special tool in a vice. Set the wrench part of the tool around the nut. Compress the spring with the special tool.

Tighten the nut to specification with the special tool.

ITEM	N-m	kgf-m	ft-lb
Driven pulley spring nut	75	7.5	54

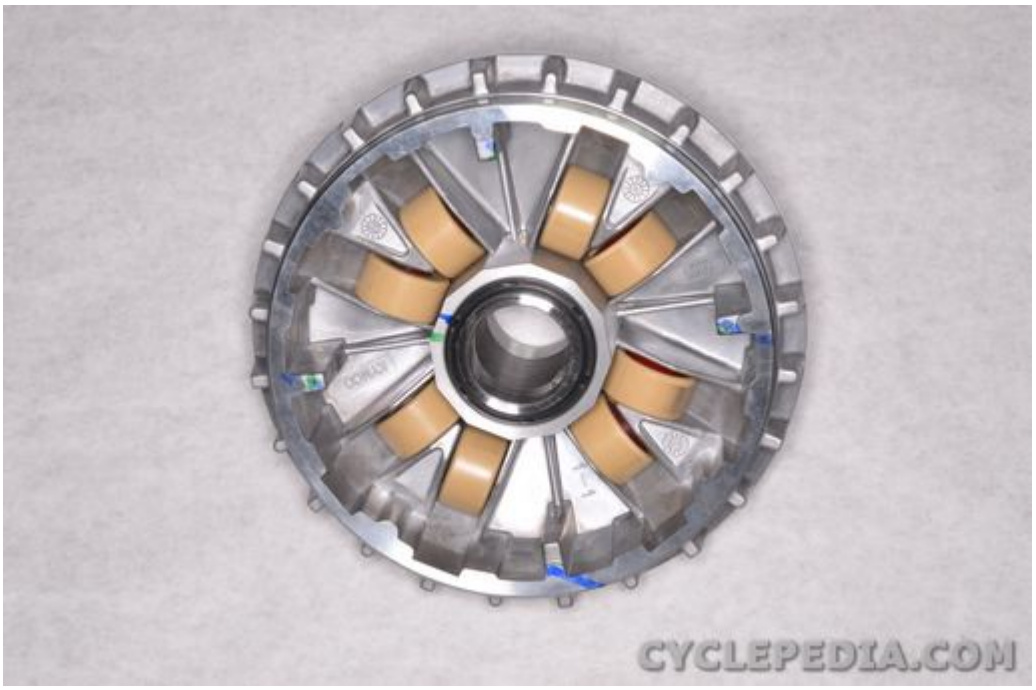
Drive Pulley



Lubricate the lips of the new dust seals with a light coat grease. Drive in the new seals with a suitable driver with the same outside diameter as the seal.

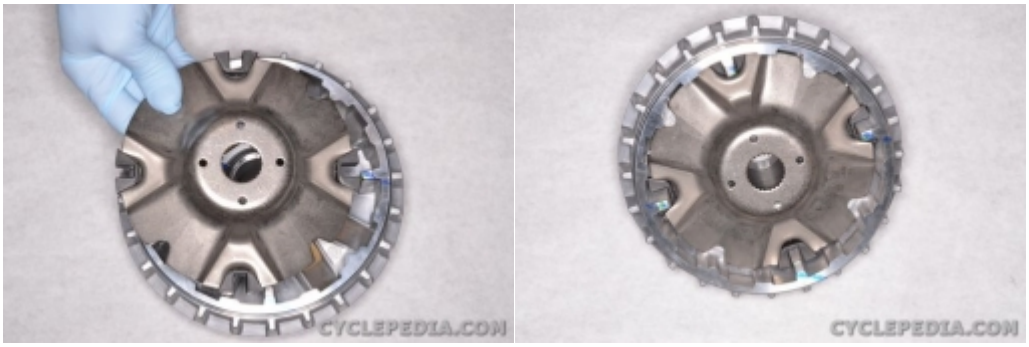
Insert the boss into the movable drive face. Apply a light coat of grease to the inside of the boss. Clean away any excess grease or any grease that contacts the pulley faces.

Install the rollers into the back of the movable drive face of the drive pulley. Position the rollers so that their thick sides are clockwise.



Install the eight rollers.

Fit the four rubber damper pieces onto the ramp.

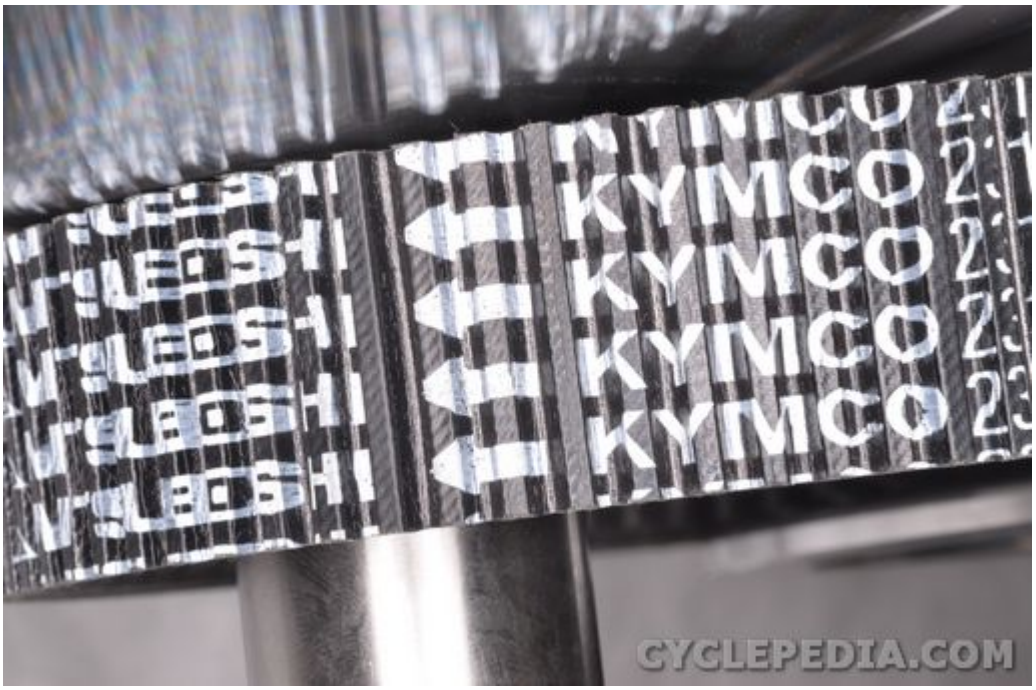


Fit the ramp into the back of the movable drive face of the drive pulley. Make sure the rubber dampers fit onto the ridges as shown.

Pulleys and Belt

Make sure the pulley faces are clean and grease free where they will contact the belt.

Slide the fixed face of the drive pulley onto the drive pulley shaft.



When the drive belt is installed make sure that the arrows are pointing towards the drive pulley when the arrow marks are on the top run of the belt.

Install the washer onto the driven pulley shaft.

Protect the threads on the driven pulley with a block.

Use a commercial bearing puller to compress the driven pulley spring. Fit the belt into the driven pulley and remove the bearing puller and block.

Install the driven pulley onto the driven pulley shaft.

Lubricate the threads of the driven pulley nut with oil. Thread on the driven pulley nut.

Hold the driven pulley with a Y-type holder and tighten the driven pulley nut to specification with a 22 mm socket.

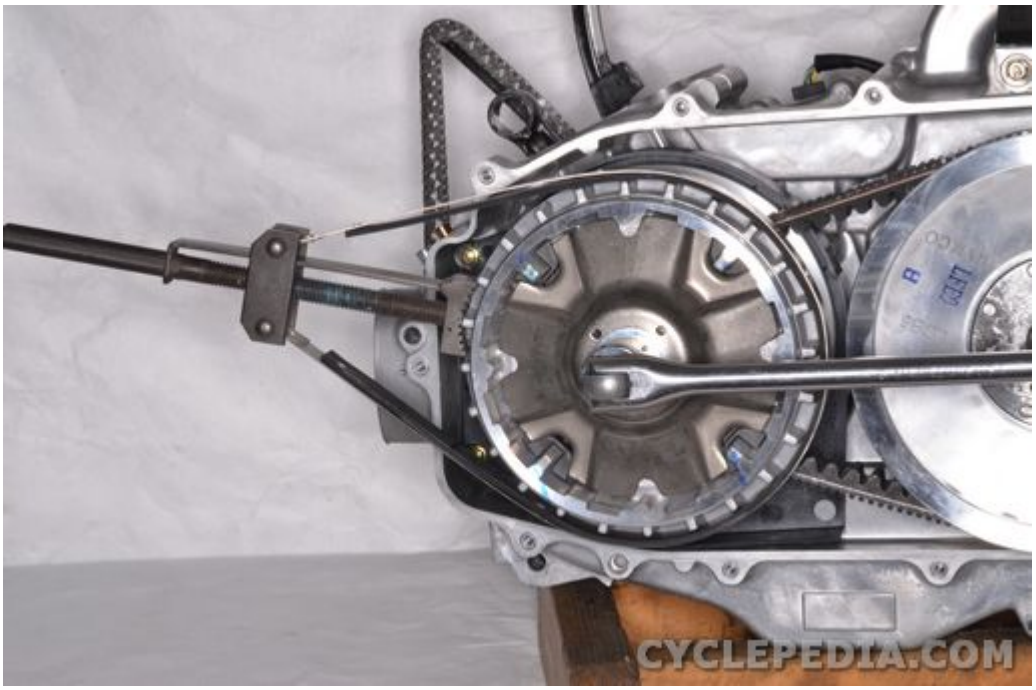
Special Tool - Y-Type Holder: A120E00056

ITEM	N-m	kgf-m	ft-lb
Driven pulley nut	100	10	72

Slide the movable drive face of the drive pulley onto the drive pulley shaft. Grasp the upper and lower runs of the belt together between the drive and driven pulleys to allow for extra slack in the belt as it sits on the drive pulley faces. Adjust the position of the belt so that when the drive pulley nut is tighten the belt will not be pinched.

Caution: If the belt is sitting too low in the drive pulley it can be pinched when the nut is tightened. This creates an improper torque reading for the nut and can cause damage to the engine if it is run with an improperly installed belt.

Lubricate the threads of the drive pulley nut with oil. Install the drive pulley washer and nut onto the drive pulley shaft. The OUTSIDE mark on the washer must face out as shown.



Hold the drive pulley with a drive pulley holder tool and tighten the nut to specification with a 26 mm socket.

Special Tool - Drive Pulley Holder: A120E00058

ITEM	N-m	kgf-m	ft-lb
Driven pulley nut	140	14	100.8

Install the belt case. See the Belt Case topic for more information.

Clutch Removal

MXU500i

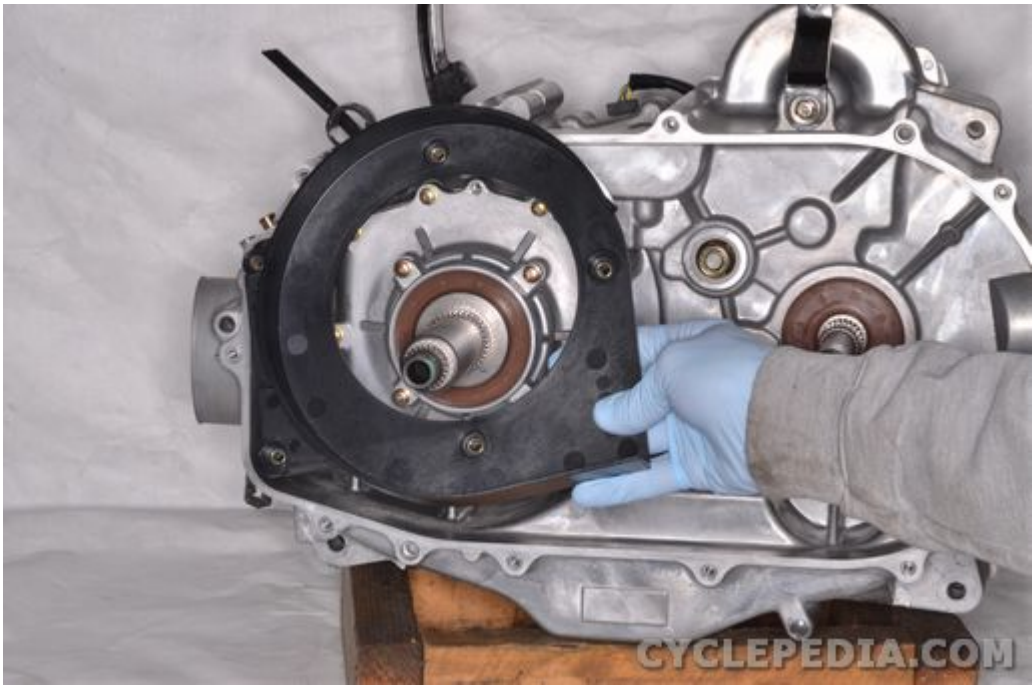
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

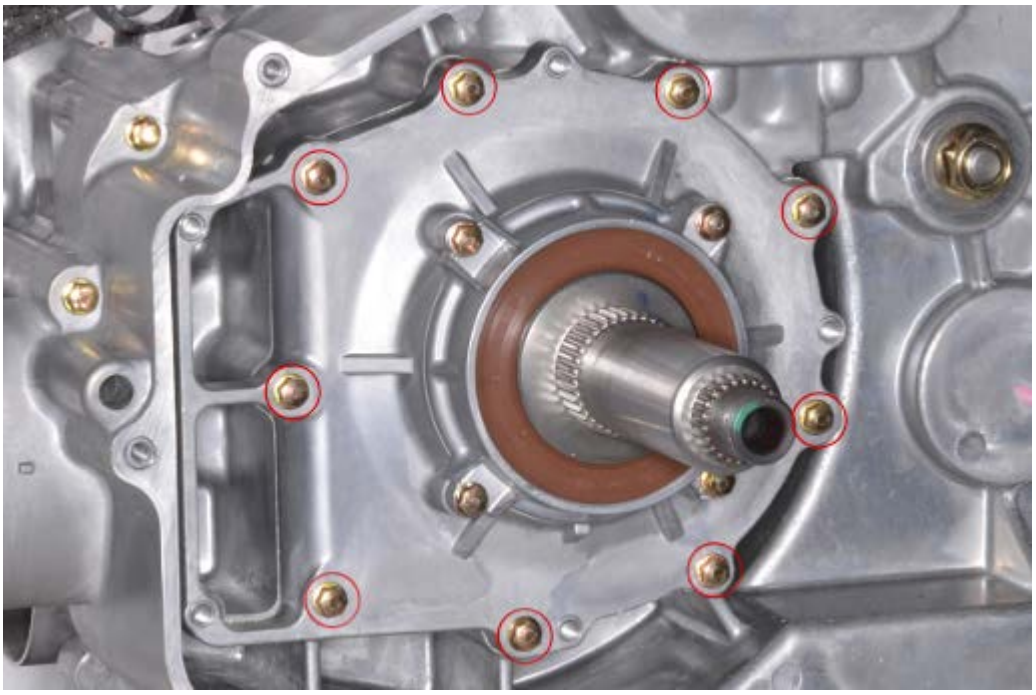
Remove the CVT belt case cover. See the Belt Case Cover topic for more information.

Remove the CVT pulleys and belt. See the CVT Removal topic for more information.

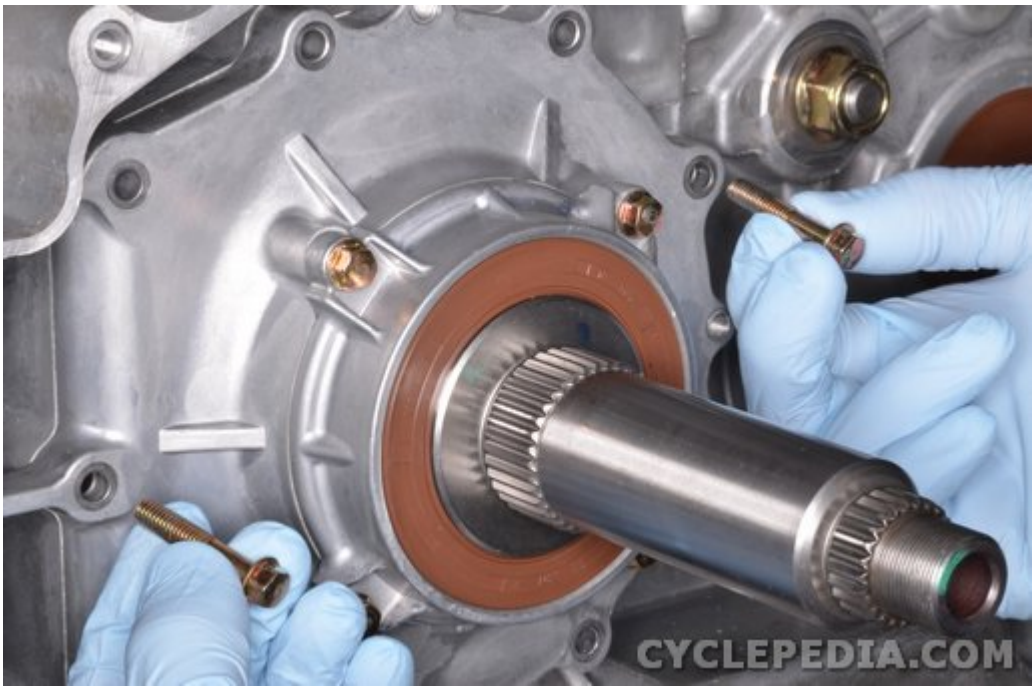
Remove the five CVT fan cover bolts with an 8 mm socket.



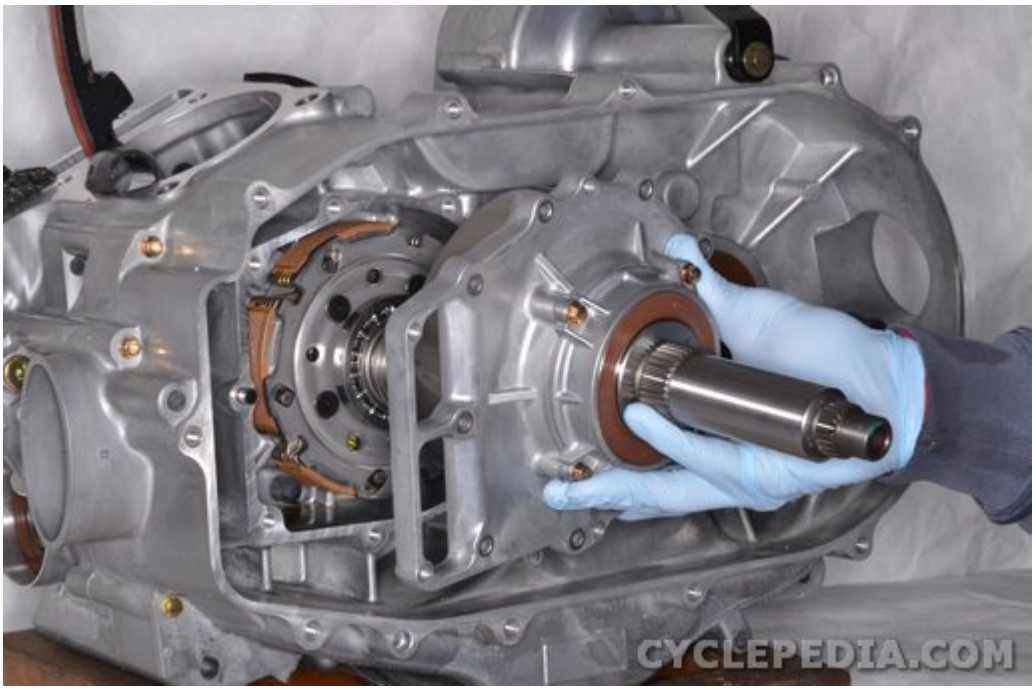
Remove the CVT fan cover.



Loosen the 9 clutch cover bolts a little bit at a time and in a crisscross pattern.

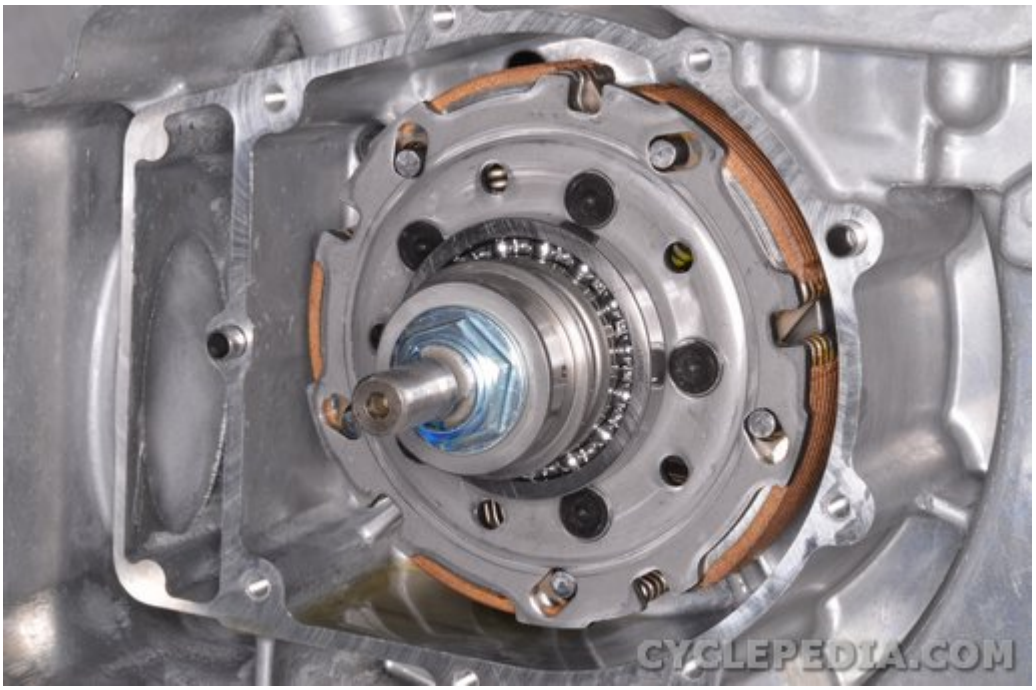


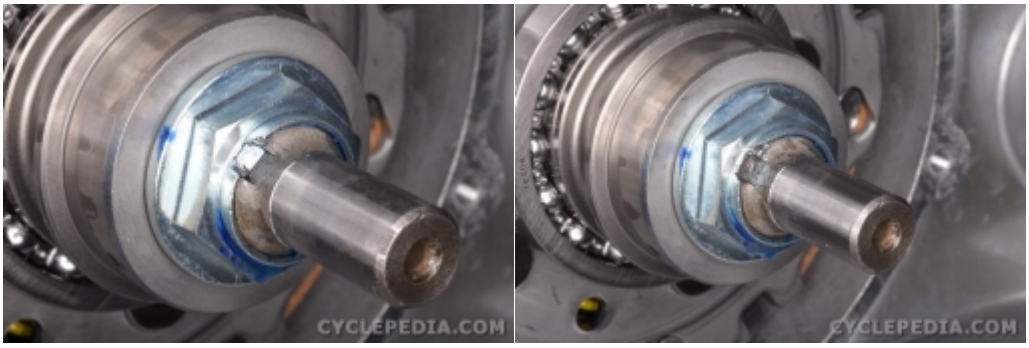
Remove the clutch cover bolts.



Remove the clutch cover assembly evenly.

Remove the two dowel pins and the clutch cover gasket.





Free the stake on the clutch nut with a chisel and a hammer.

Hold the clutch with the Y-type holder and loosen the clutch nut with a commercially available 26 mm deep well socket.

Special Tool -
Y-Type Holder: A120E00056
Lock Nut Wrench: A120E00079

Remove the clutch nut.

Slide off the outer clutch collar.

Slide the clutch assembly off of the crankshaft.

Slide off the inner clutch collar.

Inspection

Remove the clutch outer and drive pulley shaft from the clutch cover.

To check the one-way clutch in the clutch outer temporarily install the clutch and set the clutch outer in place without the cover.

When turning the clutch outer clockwise, the clutch outer should turn freely. If not, the one-way clutch assembly is faulty and should be replaced.

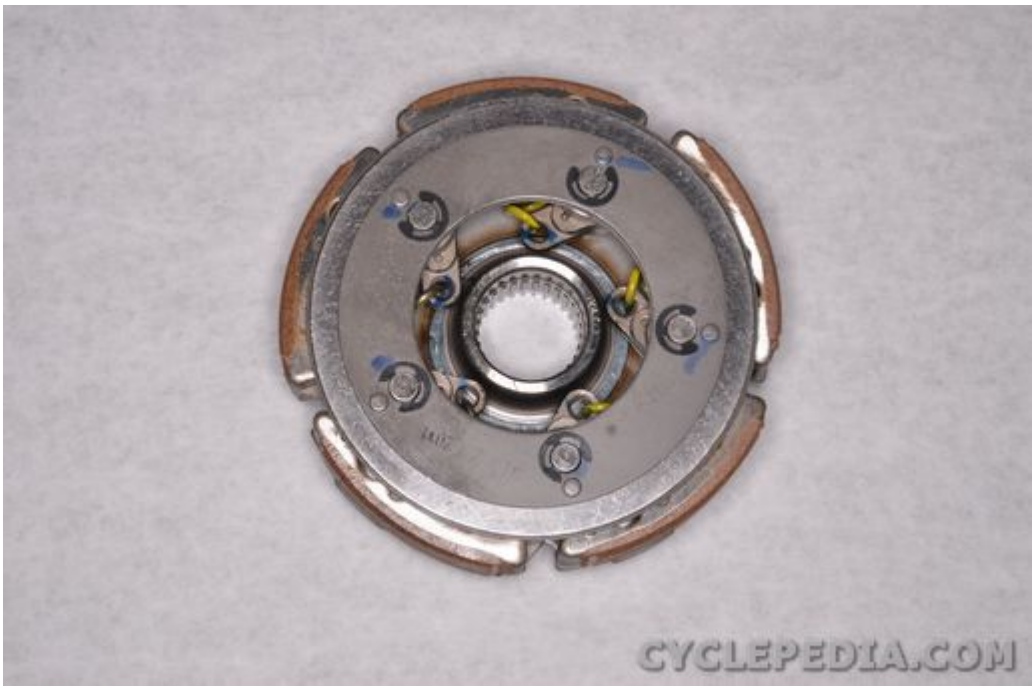
When turning the clutch outer counterclockwise, the clutch outer and crankshaft should engaged by the one-way clutch. If not, the one-way clutch assembly is faulty and should be replaced.

Remove the one-way clutch and replace it as needed.

Install the clutch outer to the crankshaft with without the clutch and collars. When turning the clutch outer clockwise or counterclockwise, the clutch outer should turn smoothly. If not, the needle bearing or the clutch outer is damaged. Inspect these components.

Inspect the inside of the clutch outer and needle bearing for wear and damage. Replace the components as needed.

If the needle bearing is in poor condition remove the snap ring and replace the bearing. Press in a new bearing and secure it with a new snap ring. Make sure the snap ring is secure in its groove.



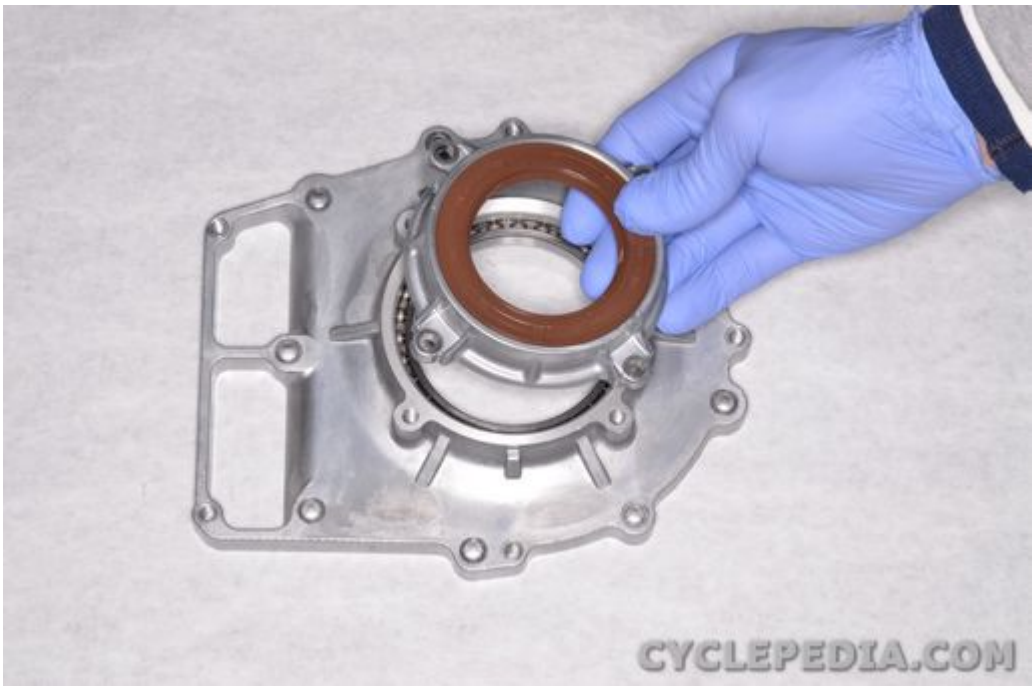
Check the clutch linings for abnormal wear and damage.

Replace the clutch if the lining thickness is below 1 mm (0.04 in).

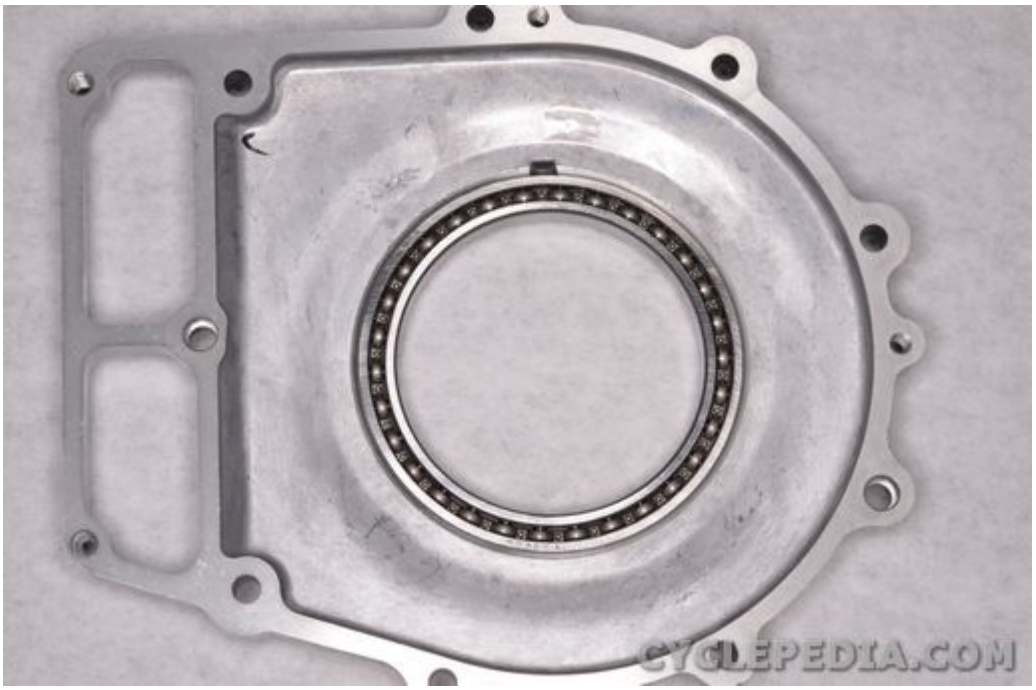
Inspect the clutch bearing by turning it with a finger. Replace the bearing if it doesn't turn smoothly or it has excessive play.

Inspect the clutch cover oil seal and replace it as needed.

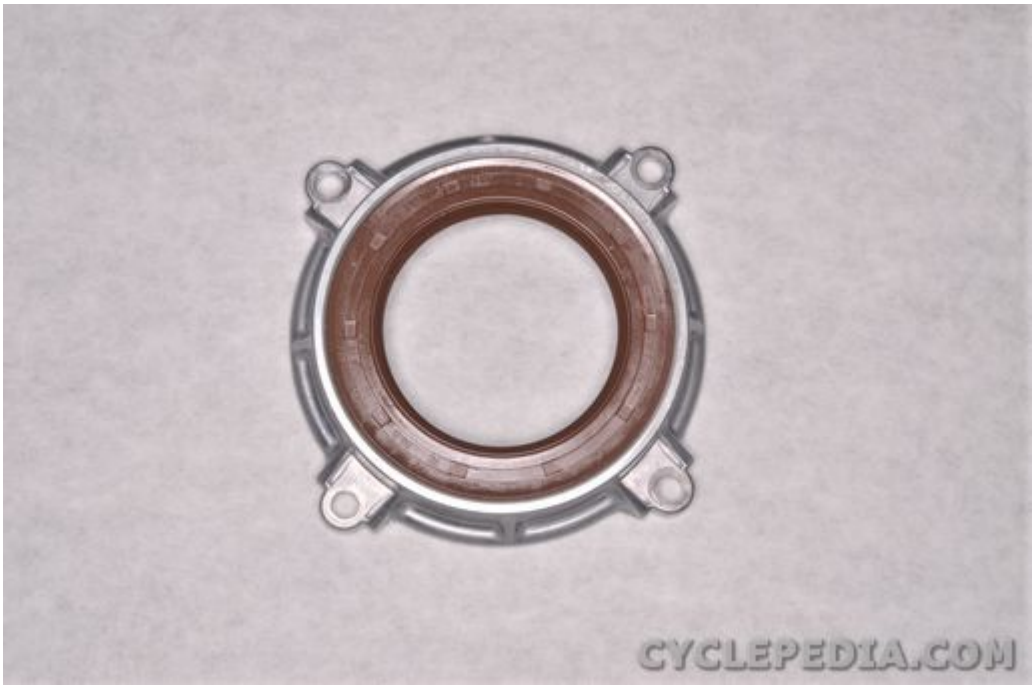
Inspect the large ball bearing in the clutch cover. Turn the bearing with a finger. Replace the bearing if it doesn't turn smoothly. Remove the seal cover to replace the bearing.



Remove the four seal cover bolts with an 8 mm socket. Take off the seal cover and discard the gasket.



Drive the bearing out from the outside of the clutch cover. Drive in the new bearing from the inside of the clutch cover. Use a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out.



Press a new seal into the seal cover. Use a suitable driver that is the same outside diameter as the seal.

Apply a light coat lightweight lithium-soap based grease to the lips of the oil seal.

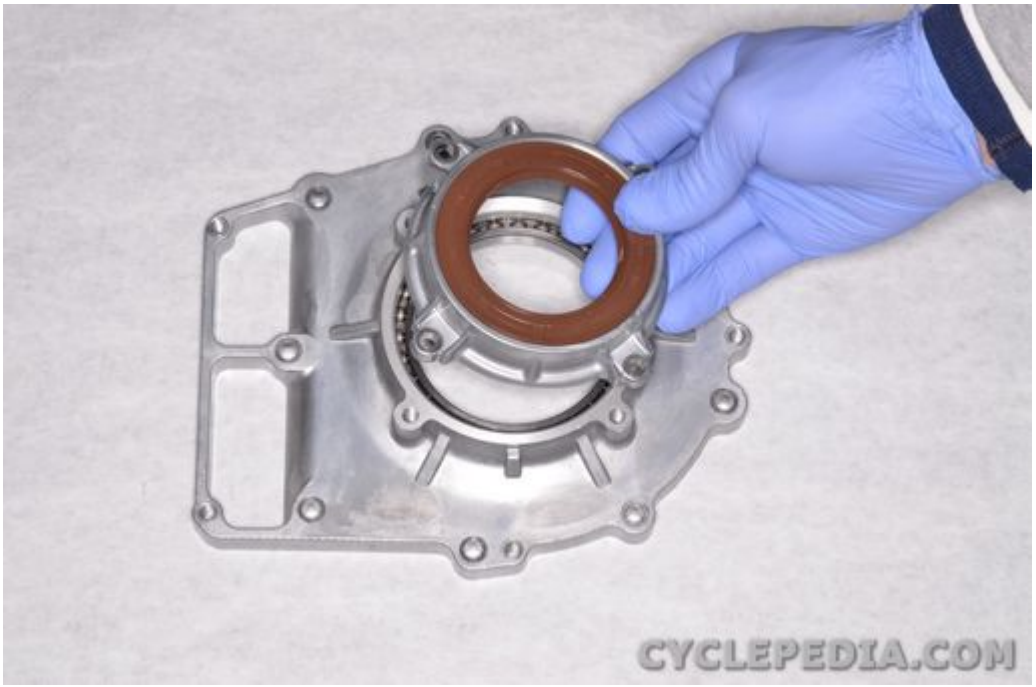
For clutch assembly and installation see the Clutch Installation topic for more information.

Install the CVT belt case cover. See the Belt Case Cover topic for more information.

Clutch Installation

MXU500i

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.



Fit the seal cover to the clutch cover with a new gasket.

Install the four seal cover bolts and tighten them securely with an 8 mm socket.

Install the one-way clutch into the clutch outer if it was removed. Lubricate the one-way clutch bearings with molybdenum disulfide grease.

Apply a light coat lightweight lithium-soap based grease to the lips of the oil seal. Lubricate the clutch bearings with fresh engine oil. Fit the clutch outer into the clutch cover.

Lubricate the inner clutch collar with fresh engine oil and slide it onto the crankshaft as shown.

Slide the clutch onto the crankshaft. Be sure to align the splines.

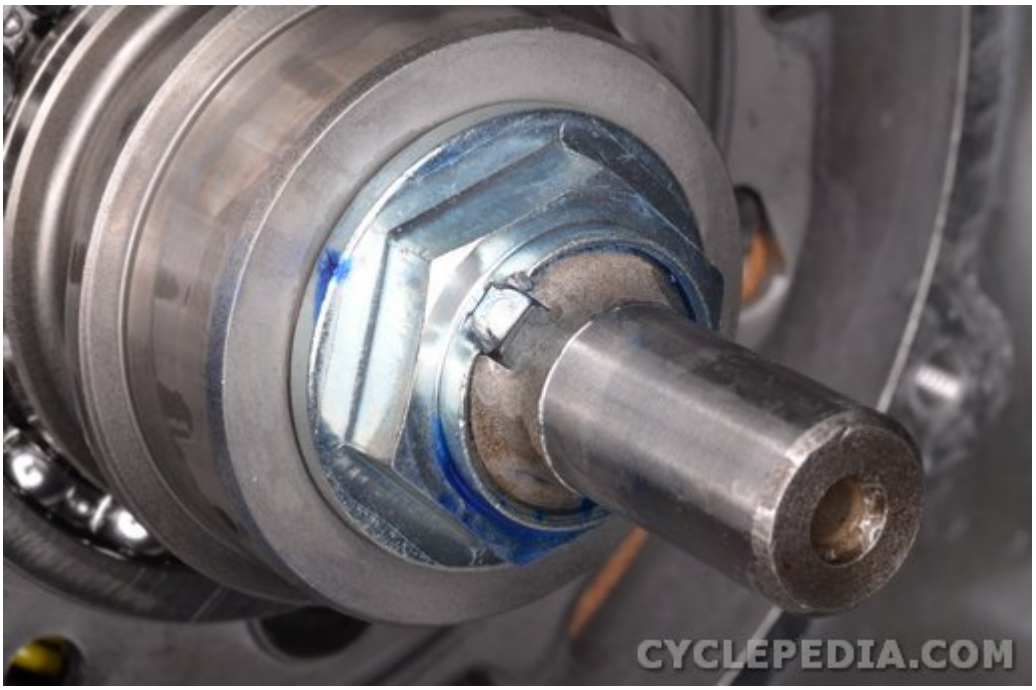
Slide the outer clutch collar onto the crankshaft.

Thread on a new clutch lock nut.

Hold the clutch with the Y-type holder and torque the clutch nut to specification with a deep well commercially available 26 mm socket.

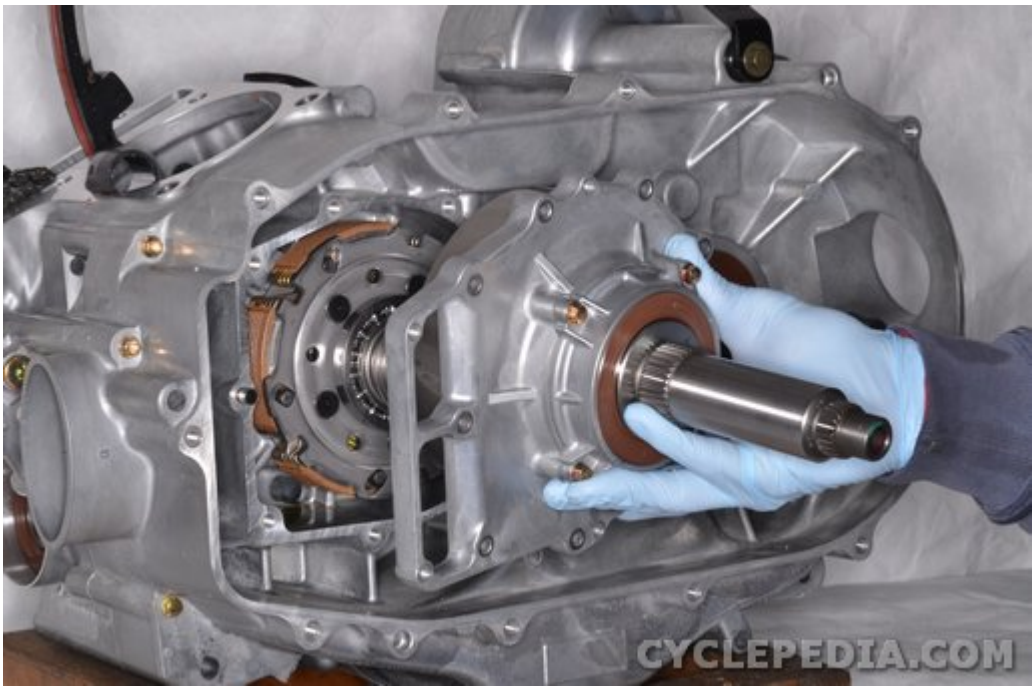
Special Tool -
Y-Type Holder: A120E00056
Lock Nut Wrench: A120E00079

ITEM	N-m	kgf-m	ft-lb
Clutch nut	140	14	100.8

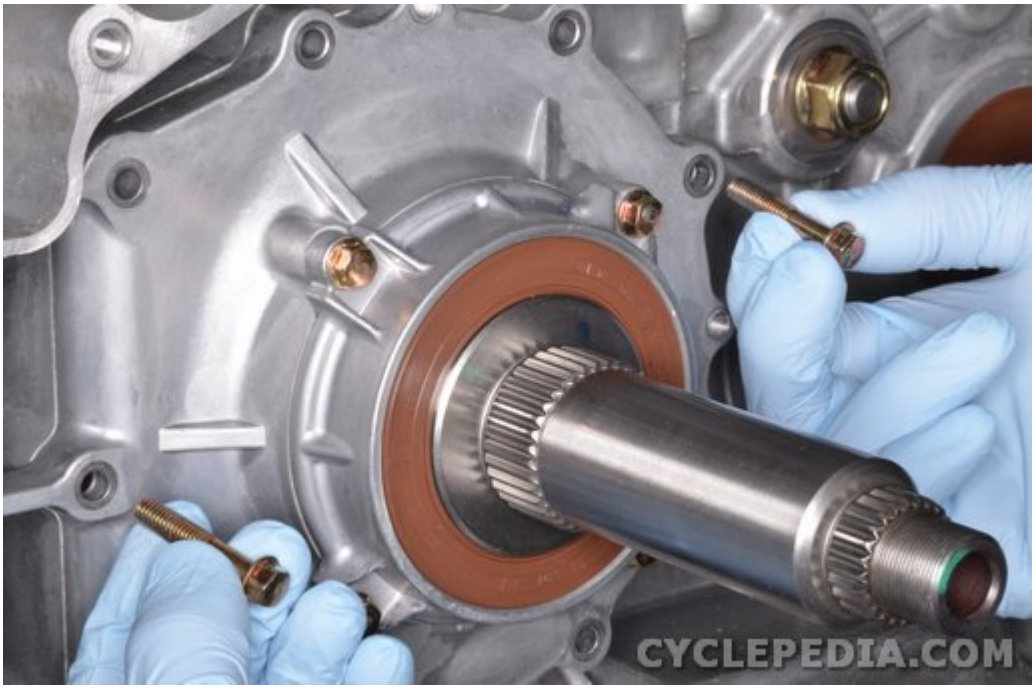


Stake the clutch nut at the groove on the crankshaft with a chisel and a hammer. Be careful to avoid damaging the threads.

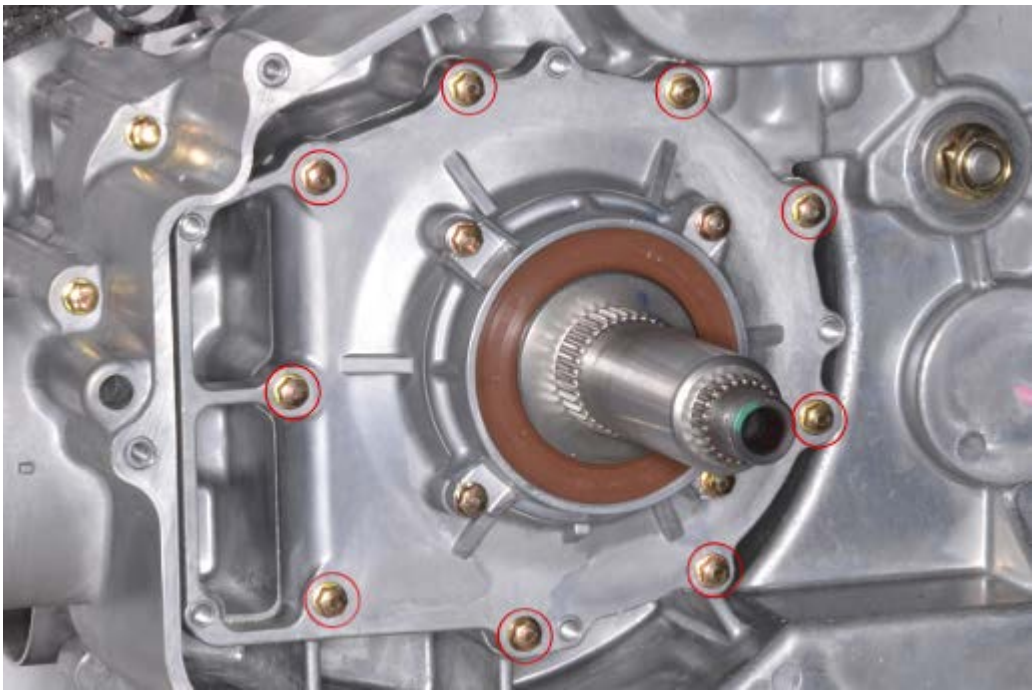
Install the two dowel pins and a new clutch cover gasket.



Guide the clutch cover assembly into place evenly.

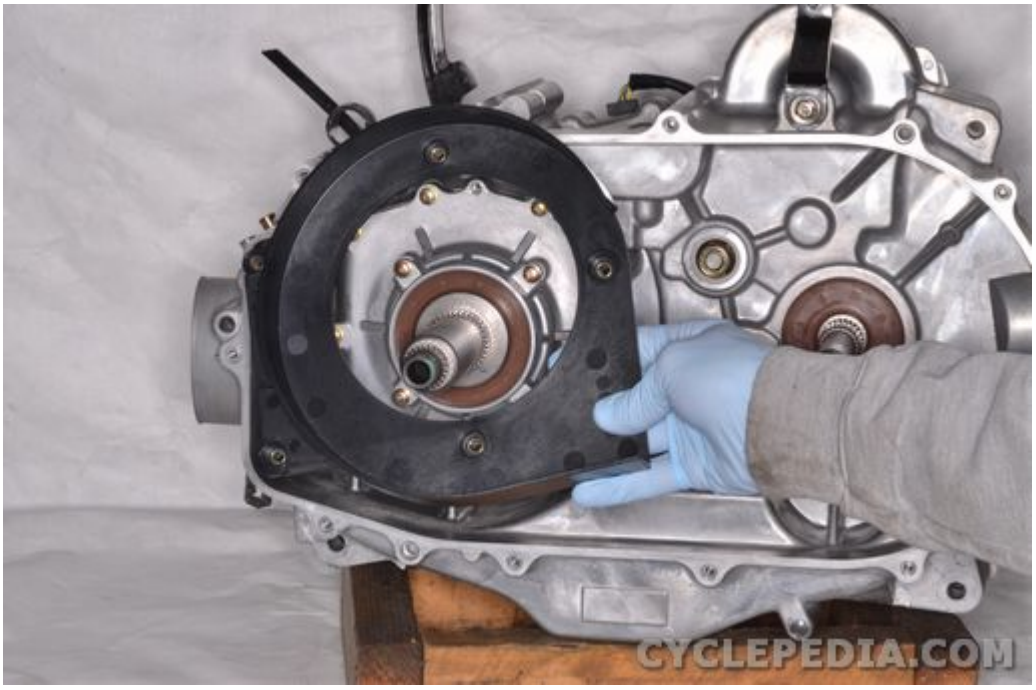


Insert the 9 clutch cover bolts.



Tighten the clutch cover bolts a little bit at a time in a crisscross pattern. Torque the bolts to specification with an 8 mm socket.

ITEM	N-m	kgf-m	ft-lb
Clutch cover bolt	10	1	7.2



Install the CVT fan cover.

Install the five CVT fan cover bolts and tighten them securely with an 8 mm socket.

Install the CVT pulleys and belt. See the CVT Installation topic for more information.

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7. CVT Continuously Variable Transmission

MXU700i

This chapter covers the location and servicing of the CVT components for the KYMCO MXU 700i models.

1.CVT Cooling Ducts 7-3
2.CVT Removal 7-11
3.CVT Installation 7-31
4.Clutch Removal 7-51
5.Clutch Installation 7-64

CVT Components Diagram

CVT Components Diagram MXU700i

GENERAL INSTRUCTIONS

• The drive pulley, clutch and driven pulley can be serviced with the engine installed.

• Avoid getting grease and oil on the drive belt and pulley faces. Remove any oil or grease from them to minimize the slipping of drive belt and drive pulley.

TROUBLESHOOTING

Engine starts but vehicle won't move

• Worn drive belt
• Broken ramp plate
• Worn or damaged clutch lining
• Broken driven face spring

Engine stalls or vehicle creeps

• Broken clutch weight spring

Lack of power

• Worn drive belt
• Weak driven face spring
• Worn weight roller
• Faulty driven face

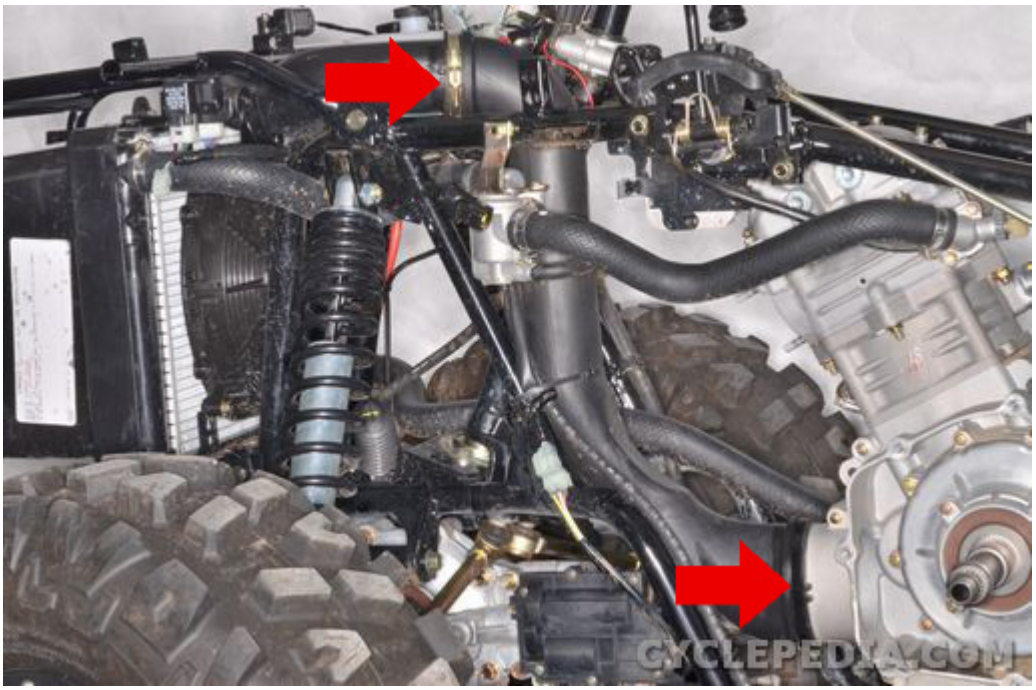
CVT Cooling Ducts

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

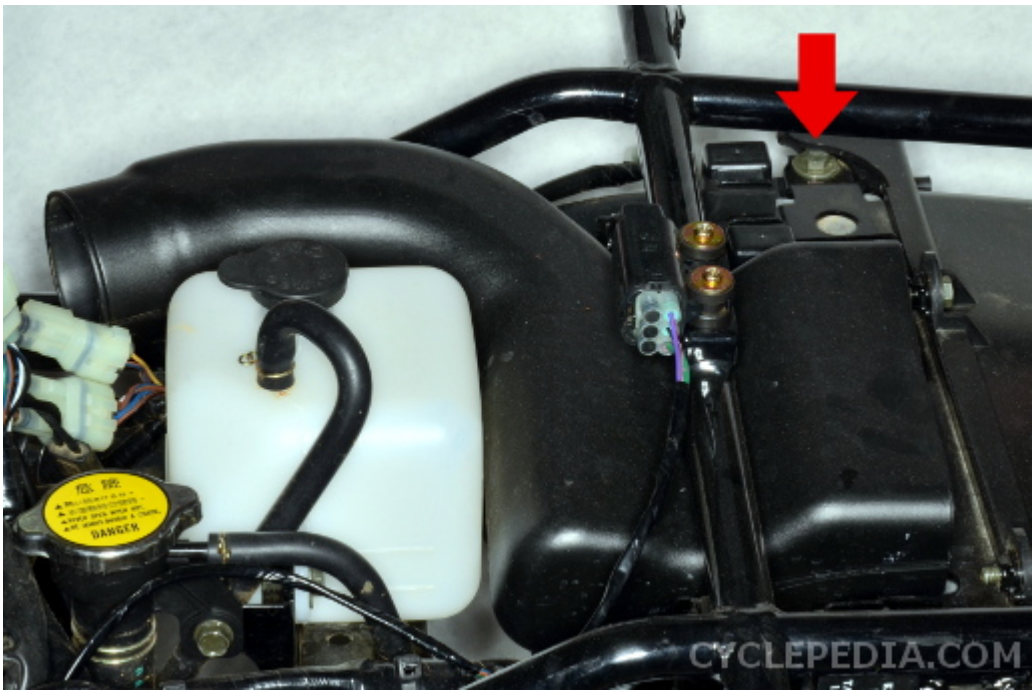
Removal

Front

Remove these components	
Component	Topic
Front rack	Racks
Seat	Seat
Front cover	Front Cover
Side covers	Side Covers
Fuel tank cover	Fuel Tank
Front mudguard fasteners	Mudguards and Footrests



The lower front cooling duct is held to the upper duct and belt case with clamps. Loosen the clamp screws with a #2 Phillips screwdriver. Free the lower front cooling duct from the upper duct and belt case.



To remove the upper front cooling duct remove the bolt with a 10 mm socket.

Rear

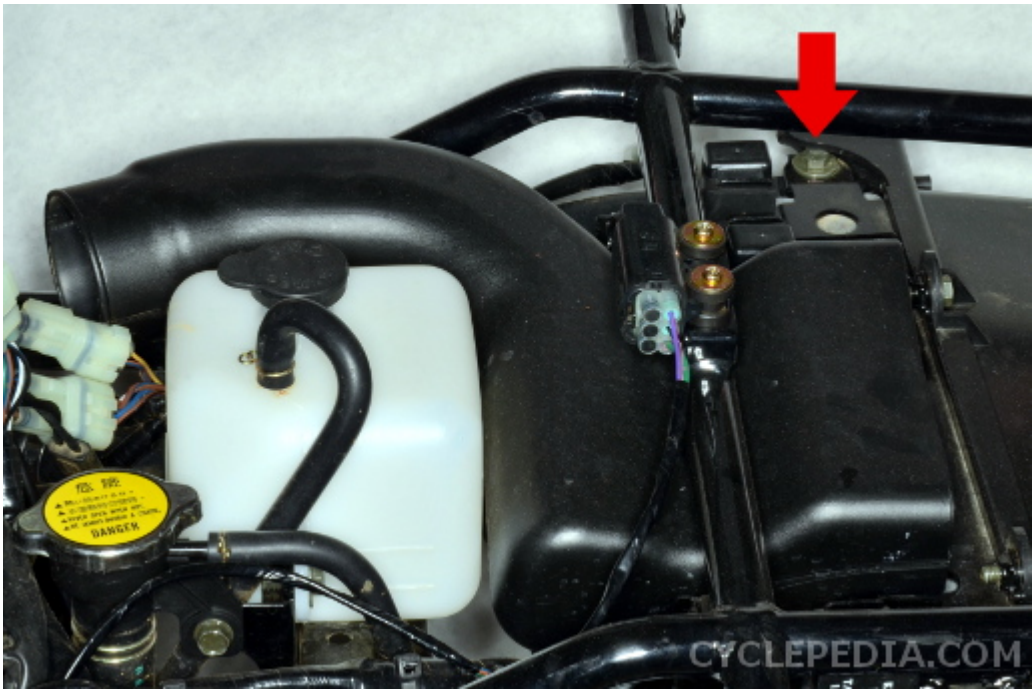
Remove these components	
Component	Topic
Rear rack	Racks
Seat	Seat
Right mudguard	Mudguards and Footrests
Side covers	Side Covers
Battery	Battery
Rear Fender	Rear Fender

Loosen the clamp with a #2 Phillips screwdriver. Free the cooling duct from the CVT case.

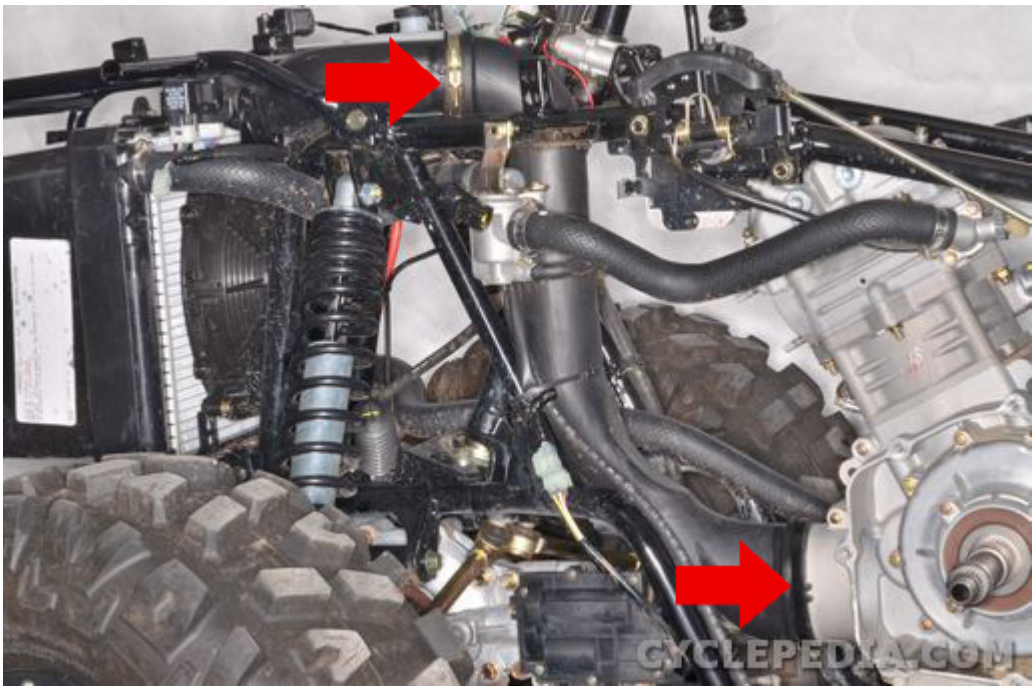
Loosen the clamp and remove the lower cooling duct from the upper. Remove the two bolts to remove the upper cooling duct.

Installation

Front



Install the upper front cooling duct into place. Insert the bolt and tighten it securely with a 10 mm socket.



Connect the lower front cooling to the upper duct and belt case.

Install the clamps and tighten them securely with a #2 Phillips screwdriver.

Install these components	
Component	Topic
Front fender	Front Fender

Front mudguard fasteners	Mudguards and Footrests
Fuel tank cover	Fuel Tank
Side covers	Side Covers
Front cover	Front Cover
Seat	Seat
Front rack	Racks

Rear

Fit the rear upper cooling duct into place and install the two bolts. Install the lower cooling duct to the upper.

Tighten the clamps securely with a #2 Phillips screwdriver.

Install these components	
Component	Topic
Rear fender	Rear Fender
Battery	Battery
Side covers	Side Covers
Mudguards	Mudguards and Footrests
Seat	Seat
Rear rack	Racks

CVT Removal

MXU700i

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Note: Do not contaminate the CVT belt and pulley faces with grease or oil.

Outer Belt Cover

Remove the left footrest/mudguard. See the Mudguards and Footrests topic for more information.

There are 10 belt case cover bolts.

Remove the belt case cover bolts with an 8 mm socket.

Remove the belt case cover. Inspect the rubber gasket and replace it as needed.

Pulleys and Belt

Hold the drive pulley with a drive pulley holder tool and loosen the nut with a 26 mm socket.

Special Tool -
Drive Pulley Holder: A120E00058

Remove the drive pulley nut and washer from the drive pulley shaft.

Slide the movable drive face of the drive pulley off of the drive pulley shaft.

Hold the driven pulley with a Y-type holder and loosen the driven pulley nut with a 22 mm socket.

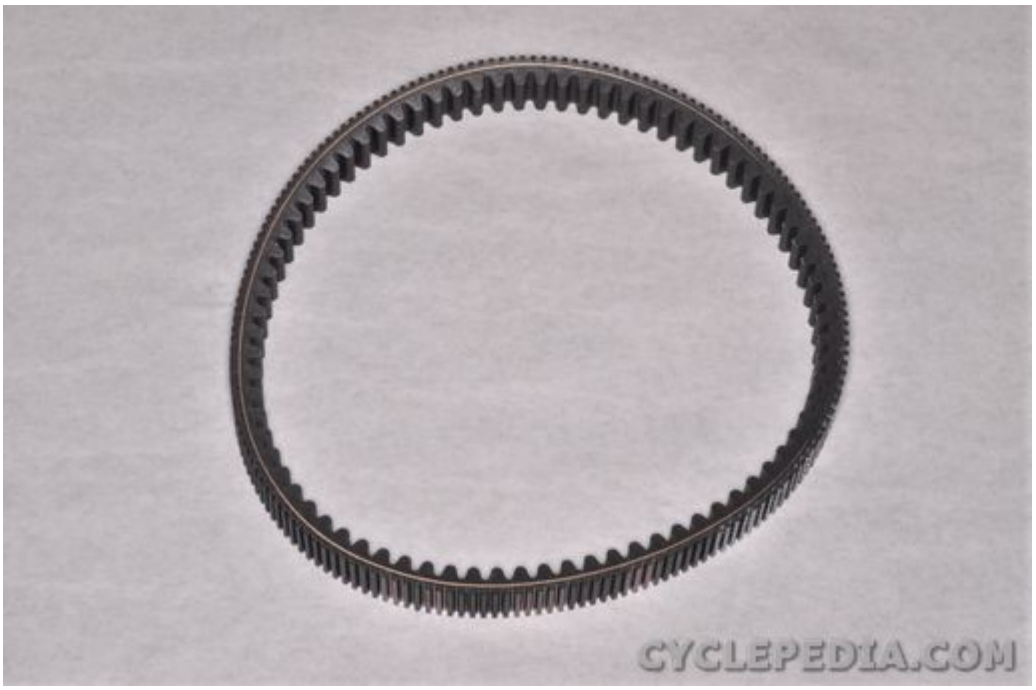
Special Tool -
Y-Type Holder: A120E00056

Remove the driven pulley nut.

Remove the driven pulley and CVT belt.

Remove the washer from the driven pulley shaft.

Remove the drive belt from the driven pulley.



Inspect the drive belt for cracks or excessive wear.

Slide off the fixed drive face of the drive pulley.

Inner Belt Case

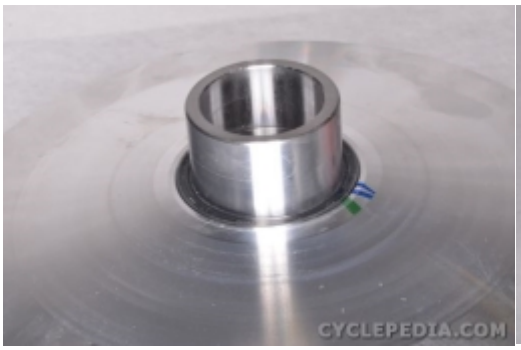
Remove the inner belt case bolts with a 10 mm socket.

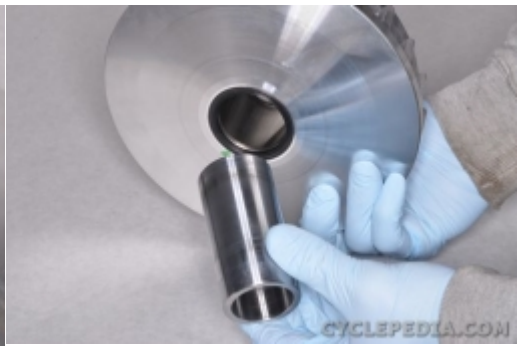
Loosen the rear CVT cooling duct clamp with a #2 Phillips screwdriver. disconnect the cooling duct from the inner belt case.

Remove the inner belt case.

Inspect the two rubber gaskets on the back of the inner belt case.

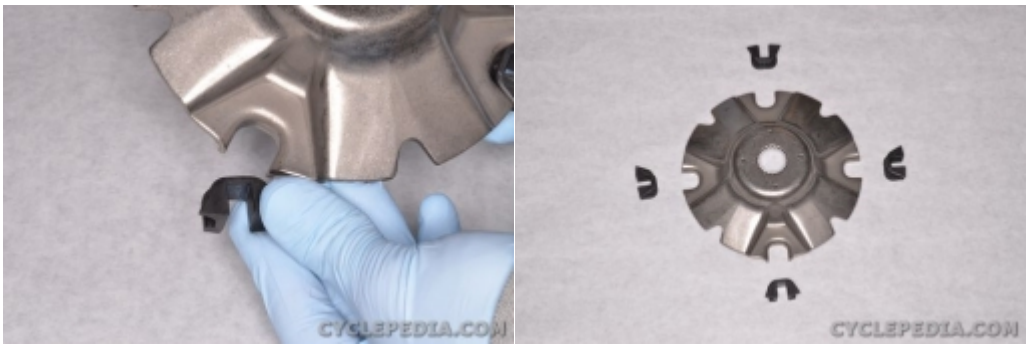
Drive Pulley Disassembly



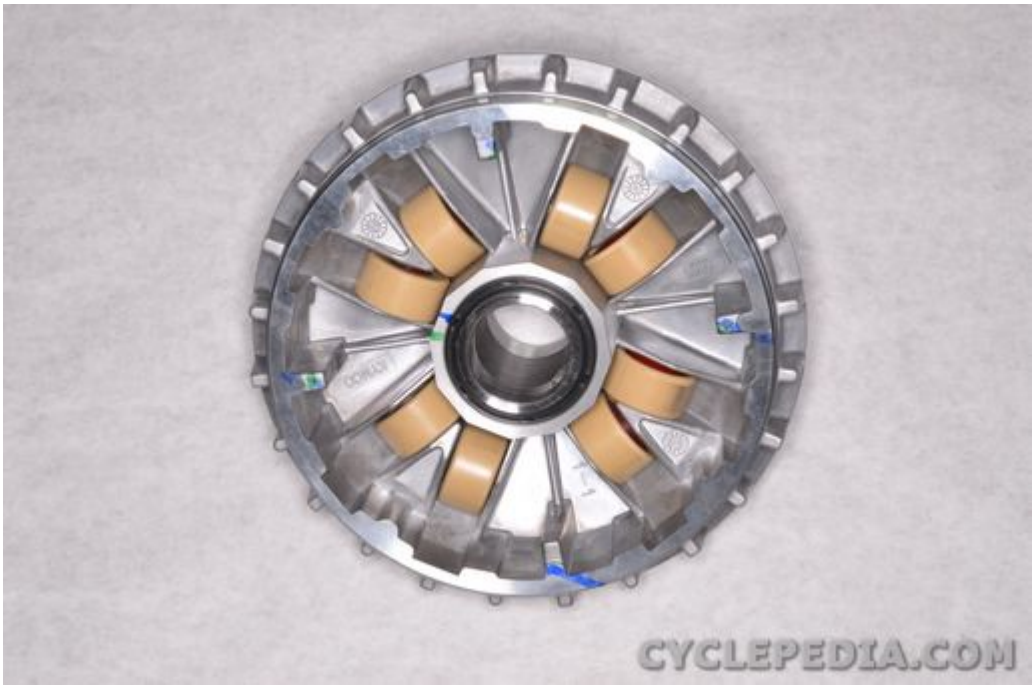


Remove the boss from the movable drive face of the drive pulley.

Lift the ramp plate out of the back of the movable drive pulley face.

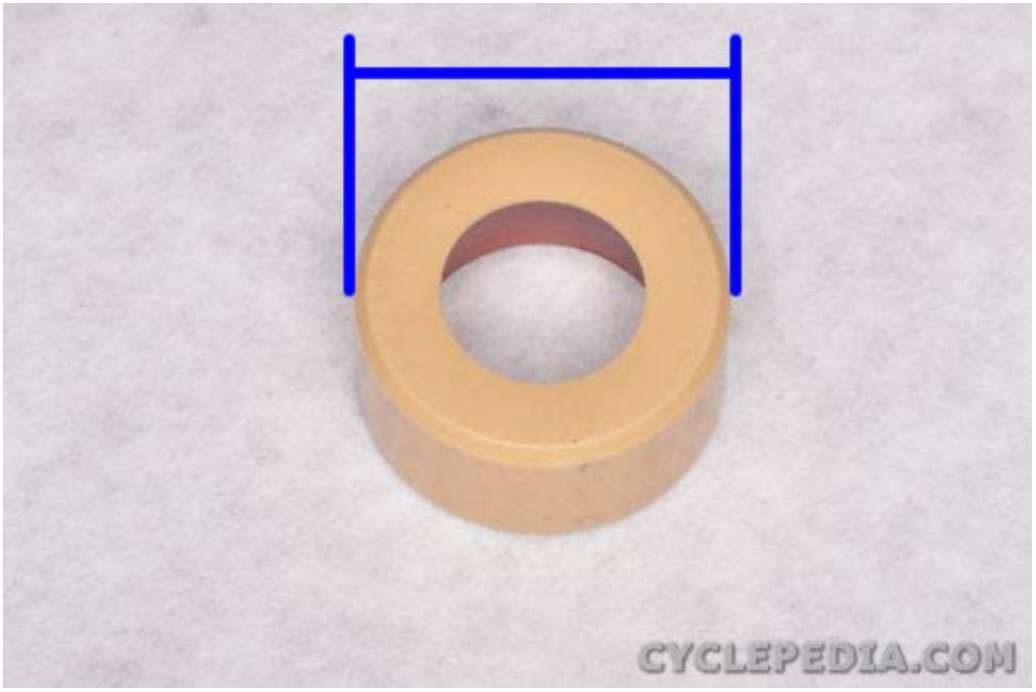


Remove the rubber damper pieces from the ramp. Replace the dampers if they are in poor condition.



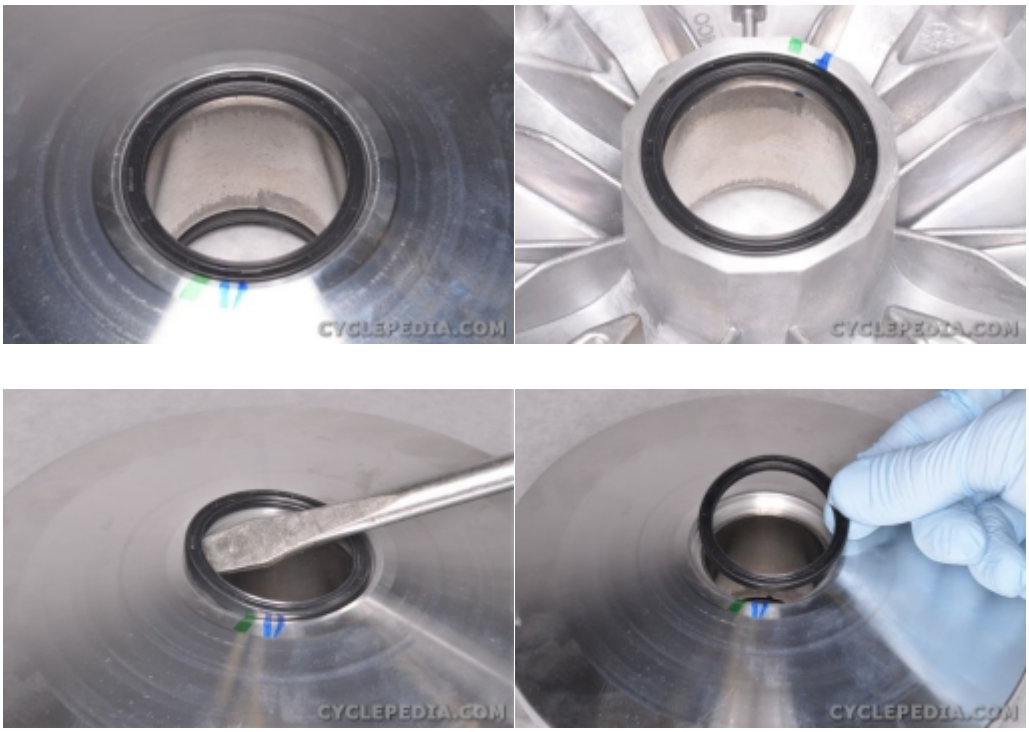
There are eight weight rollers in the back of the right face of the drive pulley.

Remove the rollers and check them for excessive or uneven wear.



Measure the outside diameter of the rollers. Replace the weight rollers as needed.

Item	Standard mm (in)	Service Limit
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)



Remove the dust seals.

Inspect the faces of the drive pulley. Clean away any grease from drive pulley components.

Driven Pulley Disassembly

A driven pulley spring compressor is needed to disassembly the driven pulley.

Special Tool -
Driven Pulley Spring Compressor: A120E00059

Fit the driven pulley onto the special tool. Fit the posts on the tool into the holes as shown.

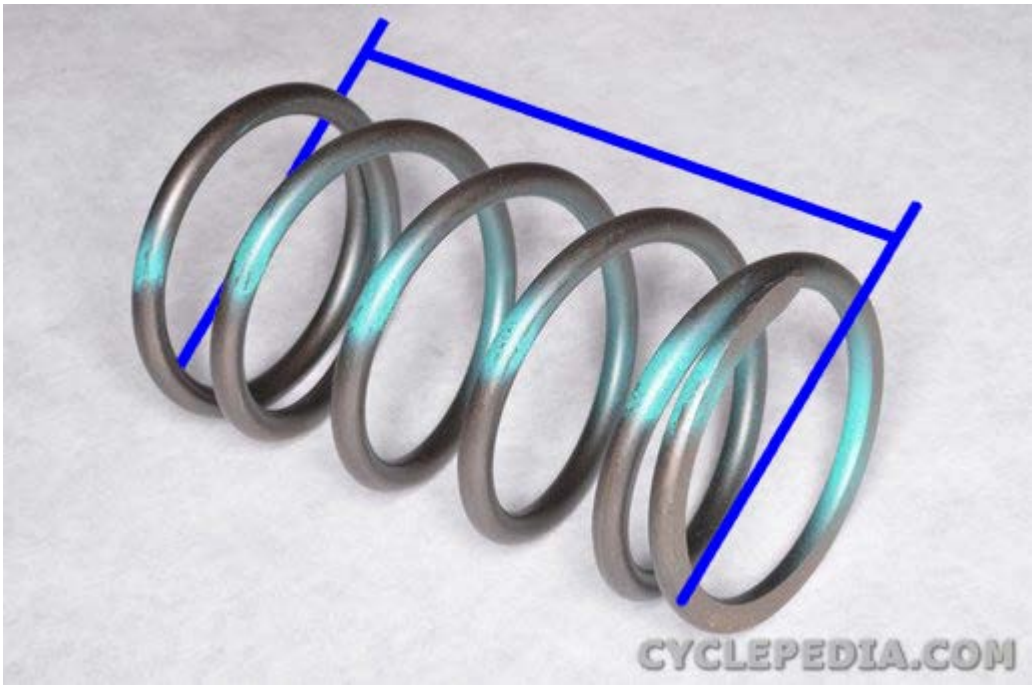
Place the special tool in a vise. Note the wrench of the special tool. Turn in the nut to compress the spring. The nut must have enough room to come free.

Loosen the nut with the wrench part of the special tool.

Remove the special tool components and the nut.

Remove the spring seat.

Lift off the spring.



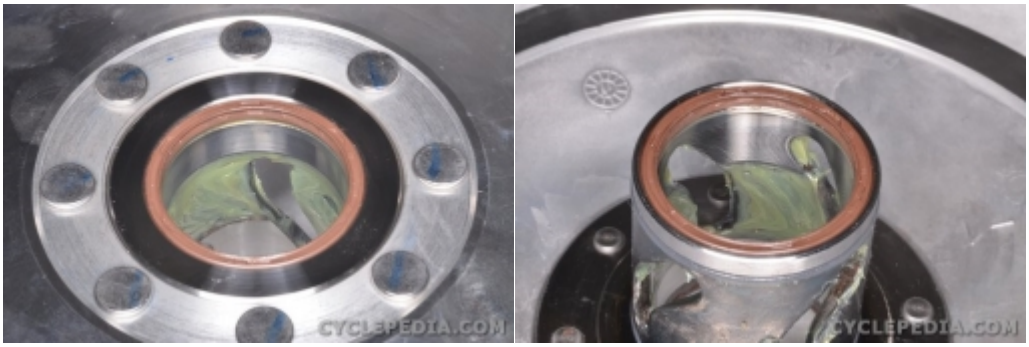
Measure the free length of the spring. Replace the spring if it is out of specification.

Item	Standard mm (in)	Service Limit
Driven pulley spring	124.3 (4.972)	121.3 (4.852)

Slide off the spring collar.

Remove the four guide rollers with guide roller pins.

Separate the fixed and movable faces of the driven pulley. Inspect the faces of the driven pulley. Clean away any grease from the faces where the belt rides.



Remove the O-rings and seals from the movable face of the driven pulley.

Clean the driven pulley components with a high flash point solvent and compressed air. Remove all of the old grease.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

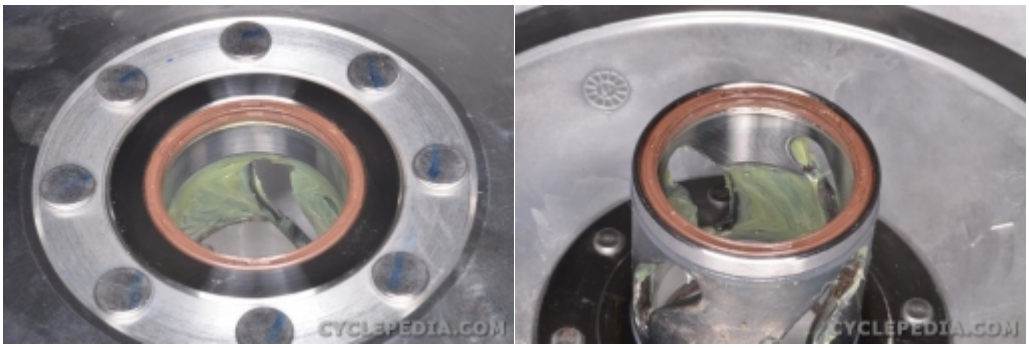
To install the CVT see the CVT Installation topic.

CVT Installation

MXU700i

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Driven Pulley



Install a new O-rings and dust seals into the movable face of the driven pulley. Drive in the new seals with a suitable driver with the same outside diameter as the seal. Coat the O-rings, seals, and inside of the movable face where it rides on the fixed face with grease.

Fit the movable driven face onto the fixed driven face. Wipe away any grease that gets on the faces where the belt will ride.

Lubricate the guide pins and rollers with grease. Place the rollers on the pins and insert the pins into driven pulley. Make sure the movable drive face moves smoothly in and out on the fixed face.

Install the spring collar.

Install the spring.

Install the spring seat.

Place the nut over the spring seat.

Fit the driven pulley onto the special tool. Fit the posts on the tool into the holes as shown.

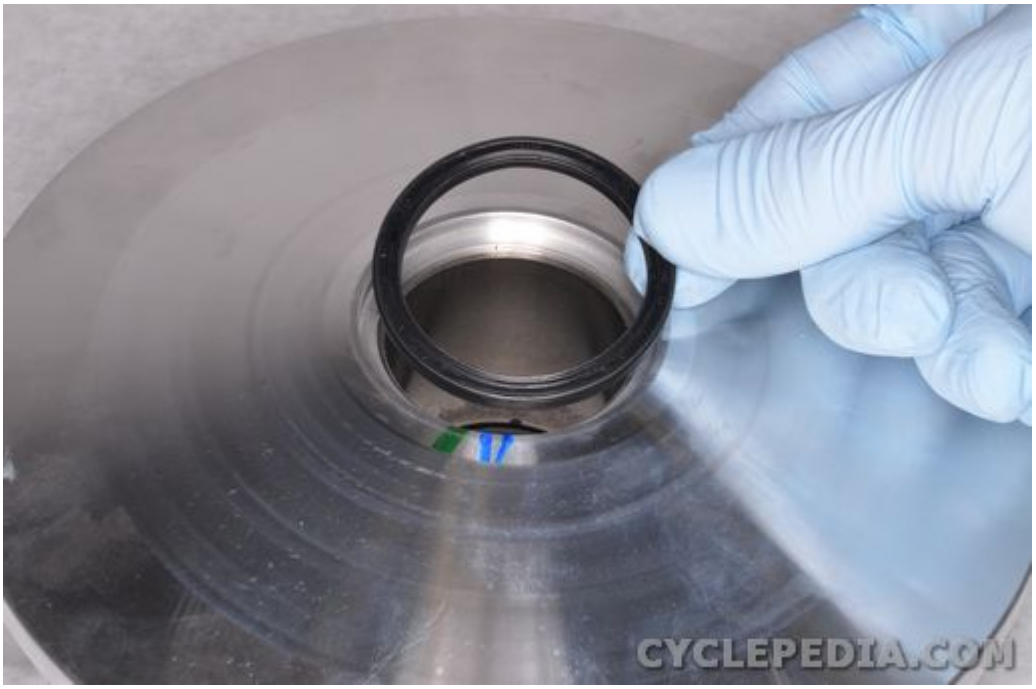
Special Tool - Driven Pulley Spring Compressor: A120E00059

Place the special tool in a vice. Set the wrench part of the tool around the nut. Compress the spring with the special tool.

Tighten the nut to specification with the special tool.

ITEM	N-m	kgf-m	ft-lb
Driven pulley spring nut	75	7.5	54

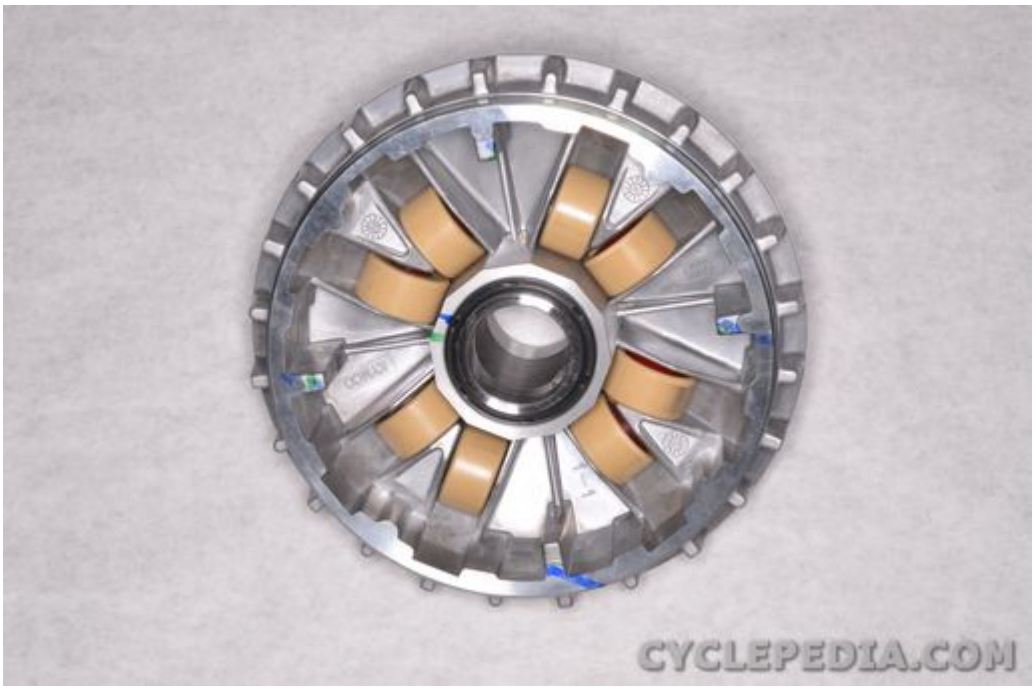
Drive Pulley



Lubricate the lips of the new dust seals with a light coat grease. Drive in the new seals with a suitable driver with the same outside diameter as the seal.

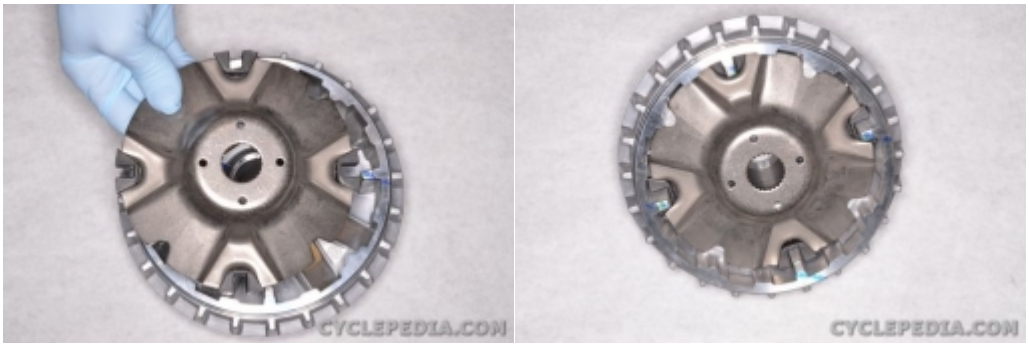
Insert the boss into the movable drive face. Apply a light coat of grease to the inside of the boss. Clean away any excess grease or any grease that contacts the pulley faces.

Install the rollers into the back of the movable drive face of the drive pulley. Position the rollers so that their thick sides are clockwise.



Install the eight rollers.

Fit the four rubber damper pieces onto the ramp.



Fit the ramp into the back of the movable drive face of the drive pulley. Make sure the rubber dampers fit onto the ridges as shown.

Inner Belt Case

Install the two rubber gaskets to the back of the inner belt case.

Install the inner belt case.

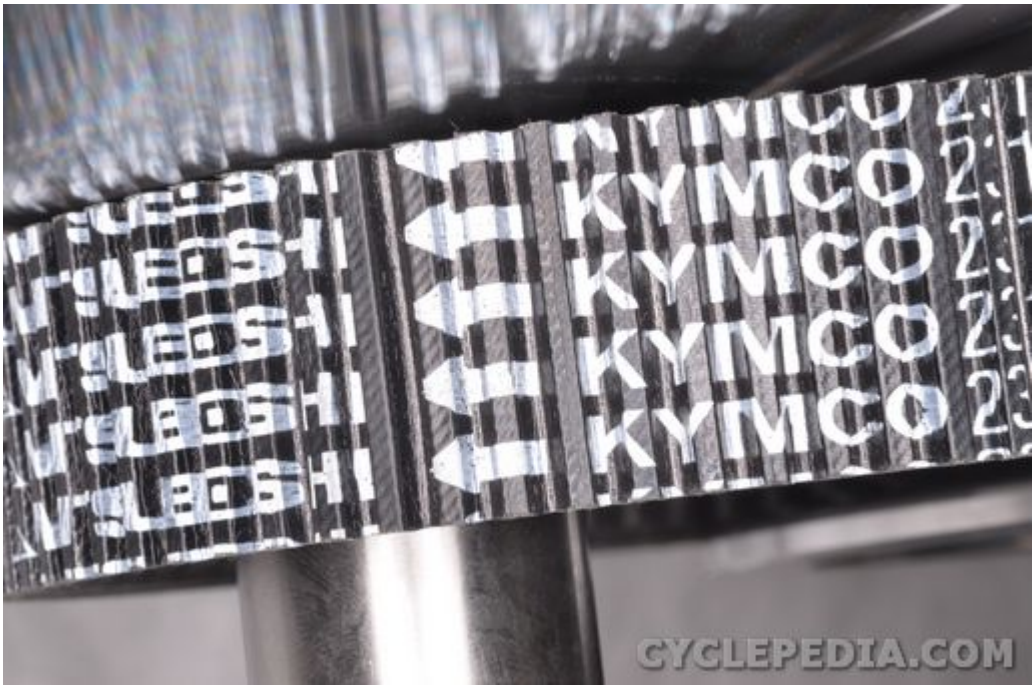
Install the inner belt case bolts and tighten them securely with a 10 mm socket.

Connect the rear cooling duct to the inner belt case as shown. Tighten the duct clamp securely with a #2 Phillips screwdriver.

Pulleys and Belt

Make sure the pulley faces are clean and grease free where they will contact the belt.

Slide the fixed face of the drive pulley onto the drive pulley shaft.



When the drive belt is installed make sure that the arrows are pointing towards the drive pulley when the arrow marks are on the top run of the belt.

Install the washer onto the driven pulley shaft.

Protect the threads on the driven pulley with a block.

Use a commercial bearing puller to compress the driven pulley spring. Fit the belt into the driven pulley and remove the bearing puller and block.

Install the driven pulley onto the driven pulley shaft. Fit the belt over the drive pulley shaft.

Lubricate the threads of the driven pulley nut with oil. Thread on the driven pulley nut.

Hold the driven pulley with a Y-type holder and tighten the driven pulley nut to specification with a 22 mm socket.

Special Tool - Y-Type Holder: A120E00056

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
		N-m	ft-lb	
PULLEY,DRIVEN	M16 x 1.5	98	72.3	APPLY OIL

Slide the movable drive face of the drive pulley onto the drive pulley shaft. Grasp the upper and lower runs of the belt together between the drive and driven pulleys to allow for extra slack in the belt as it sits on the drive pulley faces. Adjust the position of the belt so that when the drive pulley nut is tighten the belt will not be pinched.

Caution: If the belt is sitting too low in the drive pulley it can be pinched when the nut is tightened. This creates an improper torque reading for the nut and can cause damage to the engine if it is run with an improperly installed belt.

Lubricate the threads of the drive pulley nut with oil. Install the drive pulley washer and nut onto the drive pulley shaft. The OUTSIDE mark on the washer must face out as shown.

Hold the drive pulley with a drive pulley holder tool and tighten the nut to specification with a 26 mm socket.

Special Tool - Drive Pulley Holder: A120E00058

ITEM	THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
		N-m	ft-lb	
DRIVE FACE	M20 x 1.0	137.2	101.2	APPLY OIL

Outer Belt Cover

Remove the belt case cover. Make sure the rubber gasket is in place.

Install the belt case bolt as shown. Tighten the bolts evenly in a crisscross pattern.

ITEM	N-m	kgf-m	ft-lb
Belt case cover bolt	10	1.0	7.2

Install the left footrest/mudguard. See the Mudguards and Footrests topic for more information.

Clutch Removal

MXU700i

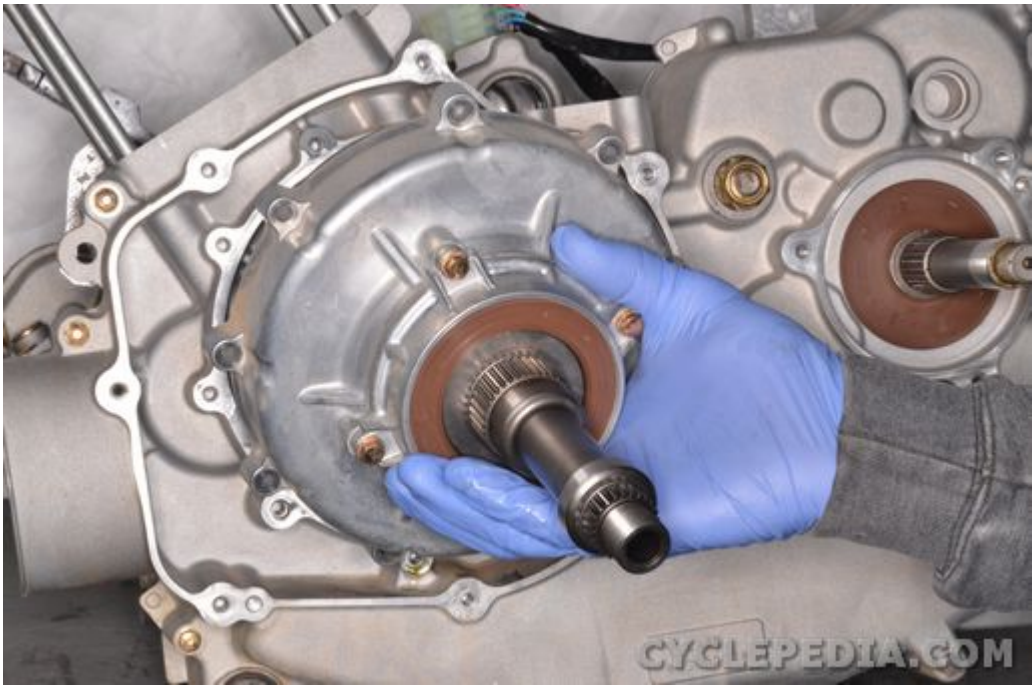
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

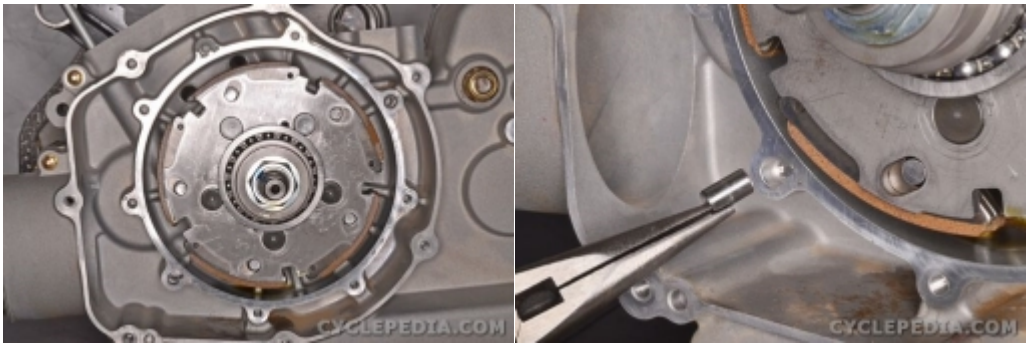
Remove the CVT pulleys and belt. See the CVT Removal topic for more information.

Loosen the 9 clutch cover bolts a little bit at a time and in a crisscross pattern.

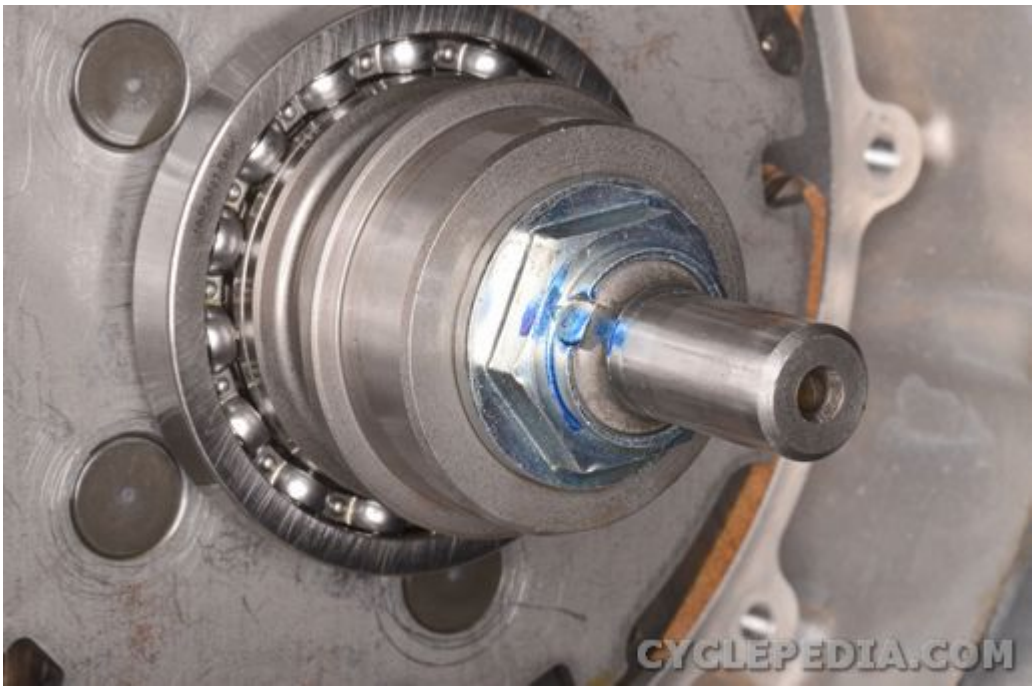
Remove the clutch cover bolts with an 8 mm socket.

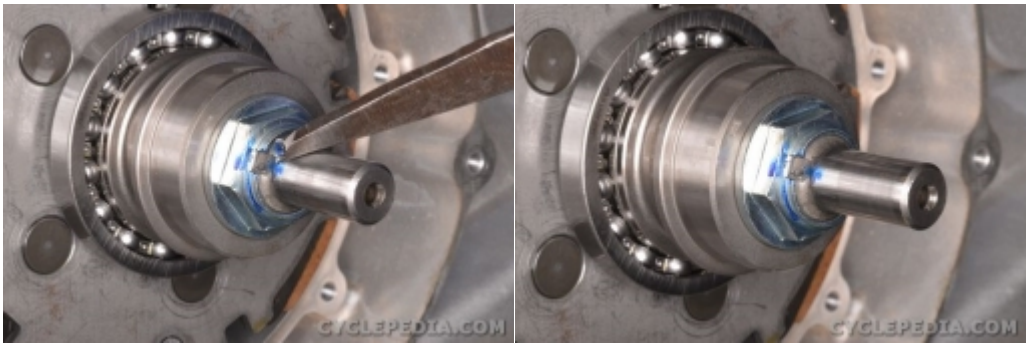


Remove the clutch cover assembly evenly.



Remove the two dowel pins and the clutch cover gasket.





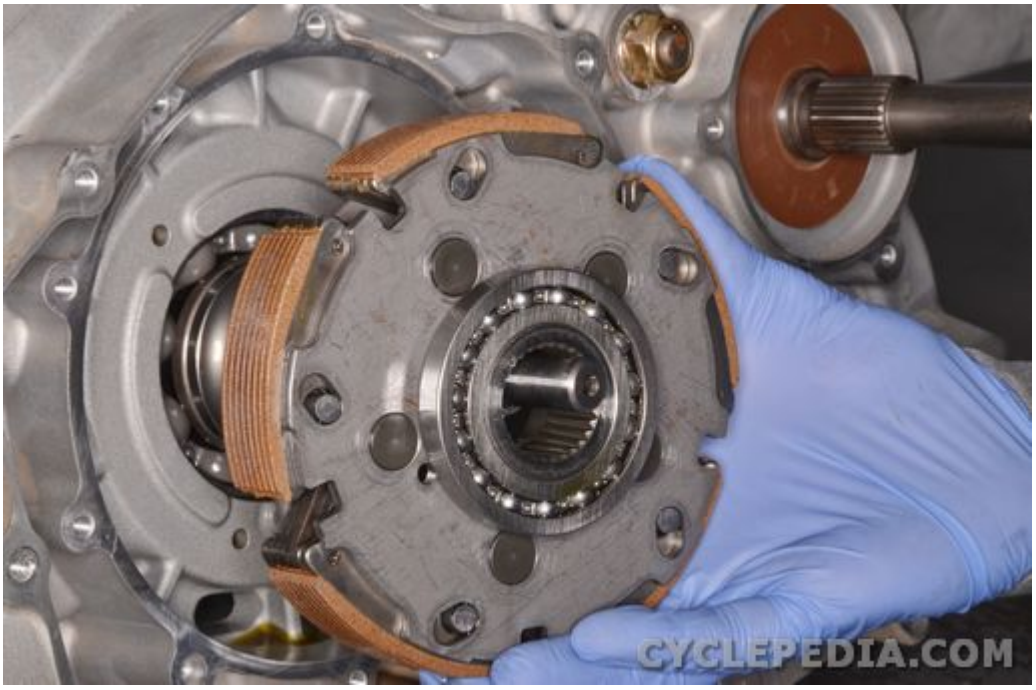
Free the stake on the clutch nut with a chisel and a hammer.

Hold the clutch with the Y-type holder and loosen the clutch nut with a commercially available 26 mm deep well socket.

Special Tool -
Y-Type Holder: A120E00056
Lock Nut Wrench: A120E00079

Remove the clutch nut.

Slide off the outer clutch collar.



Slide the clutch assembly off of the crankshaft.

Slide off the inner clutch collar.

Inspection

Remove the clutch outer and drive pulley shaft from the clutch cover.

To check the one-way clutch in the clutch outer temporarily install the clutch and set the clutch outer in place without the cover.

When turning the clutch outer clockwise, the clutch outer should turn freely. If not, the one-way clutch assembly is faulty and should be replaced.

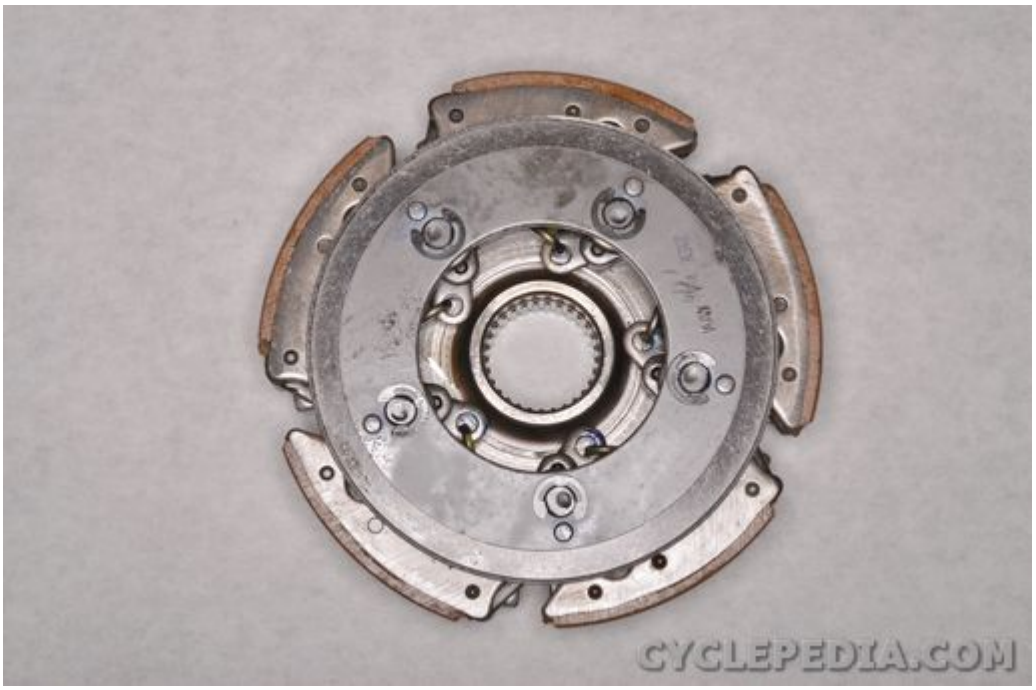
When turning the clutch outer counterclockwise, the clutch outer and crankshaft should engaged by the one-way clutch. If not, the one-way clutch assembly is faulty and should be replaced.

Remove the one-way clutch and replace it as needed.

Install the clutch outer to the crankshaft with without the clutch and collars. When turning the clutch outer clockwise or counterclockwise, the clutch outer should turn smoothly. If not, the needle bearing or the clutch outer is damaged. Inspect these components.

Inspect the inside of the clutch outer and needle bearing for wear and damage. Replace the components as needed.

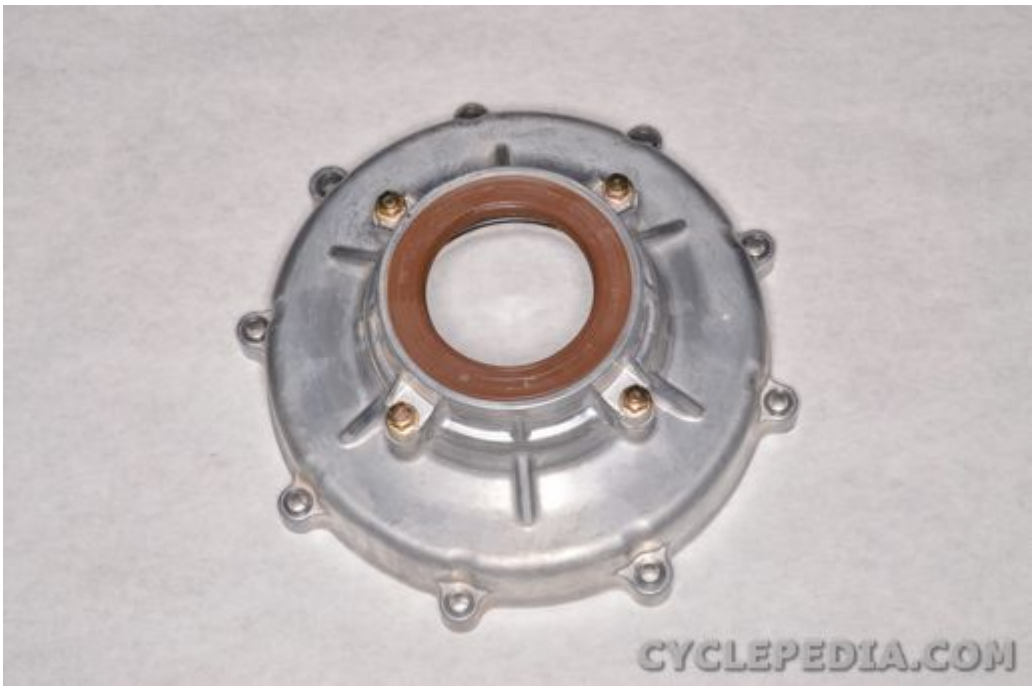
If the needle bearing is in poor condition remove the snap ring and replace the bearing. Press in a new bearing and secure it with a new snap ring. Make sure the snap ring is secure in its groove.



Check the clutch linings for abnormal wear and damage.

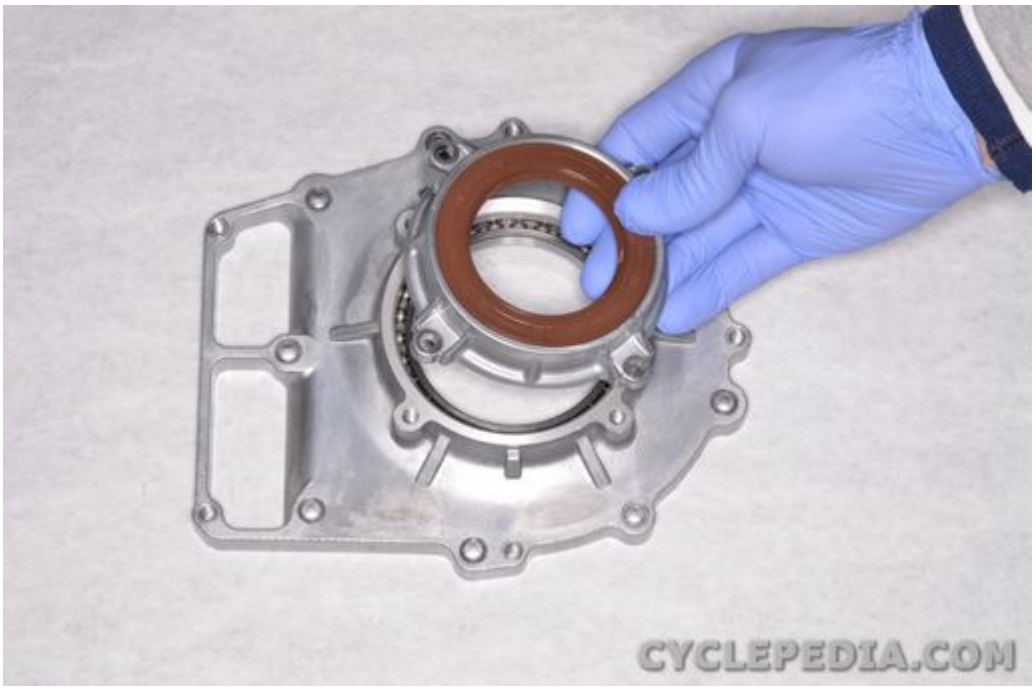
Replace the clutch if the lining thickness is below 1 mm (0.04 in).

Inspect the clutch bearing by turning it with a finger. Replace the bearing if it doesn't turn smoothly or it has excessive play.

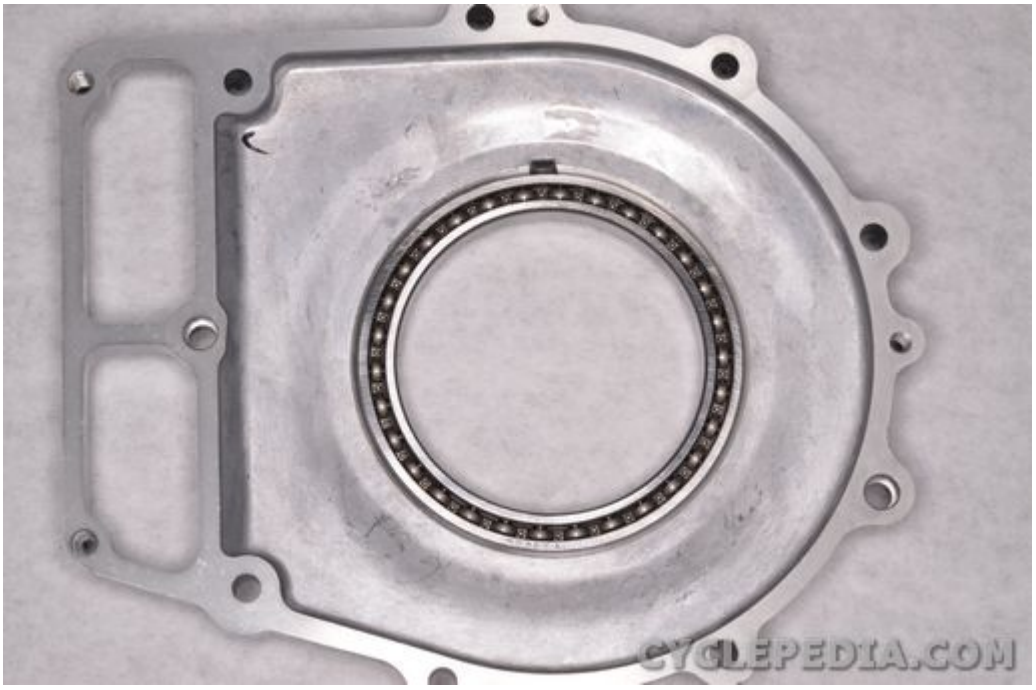


Inspect the clutch cover oil seal and replace it as needed.

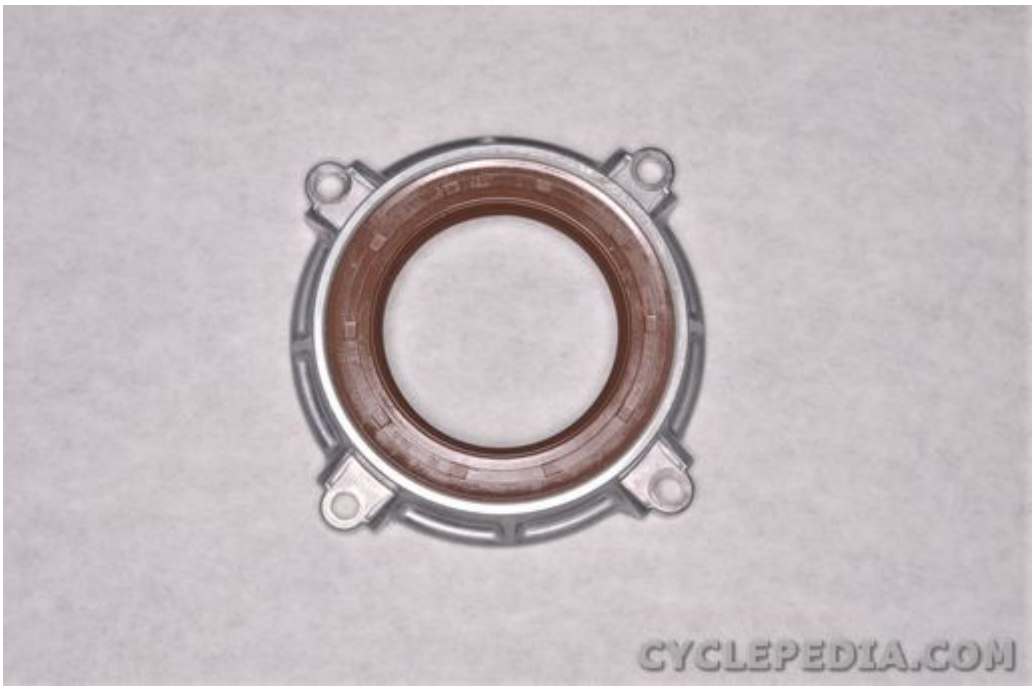
Inspect the large ball bearing in the clutch cover. Turn the bearing with a finger. Replace the bearing if it doesn't turn smoothly. Remove the seal cover to replace the bearing.



Remove the four seal cover bolts with an 8 mm socket. Take off the seal cover and discard the gasket.



Drive the bearing out from the outside of the clutch cover. Drive in the new bearing from the inside of the clutch cover. Use a suitable driver that is the same outside diameter as the bearing. The manufactures markings on the bearing must face out.



Press a new seal into the seal cover. Use a suitable driver that is the same outside diameter as the seal.

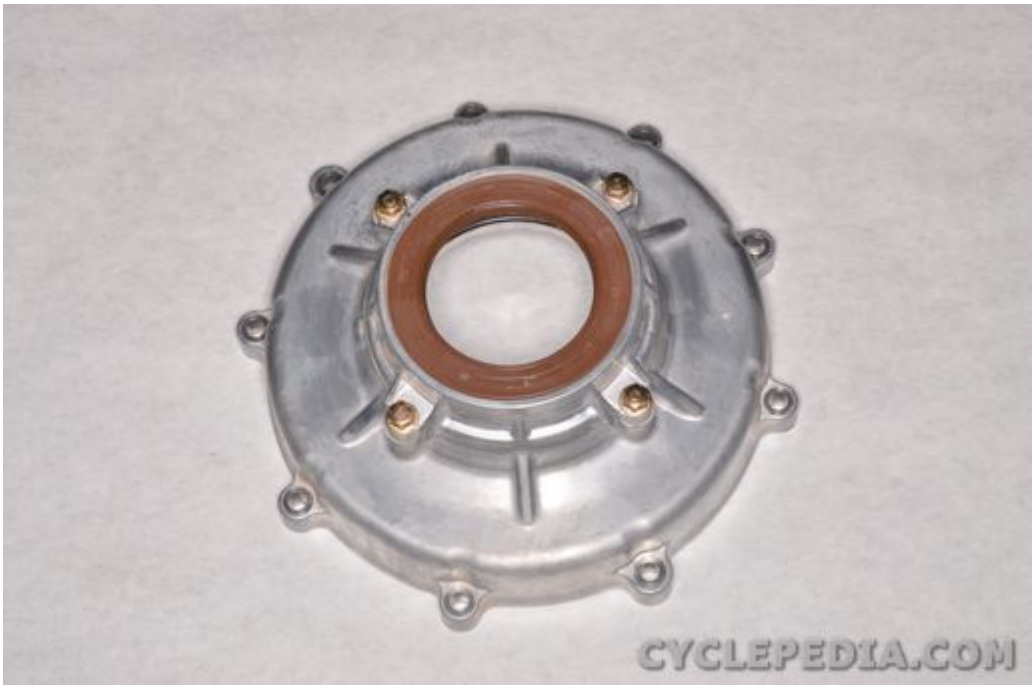
Apply a light coat lightweight lithium-soap based grease to the lips of the oil seal.

For clutch assembly and installation see the Clutch Installation topic for more information.

Clutch Installation

MXU700i

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

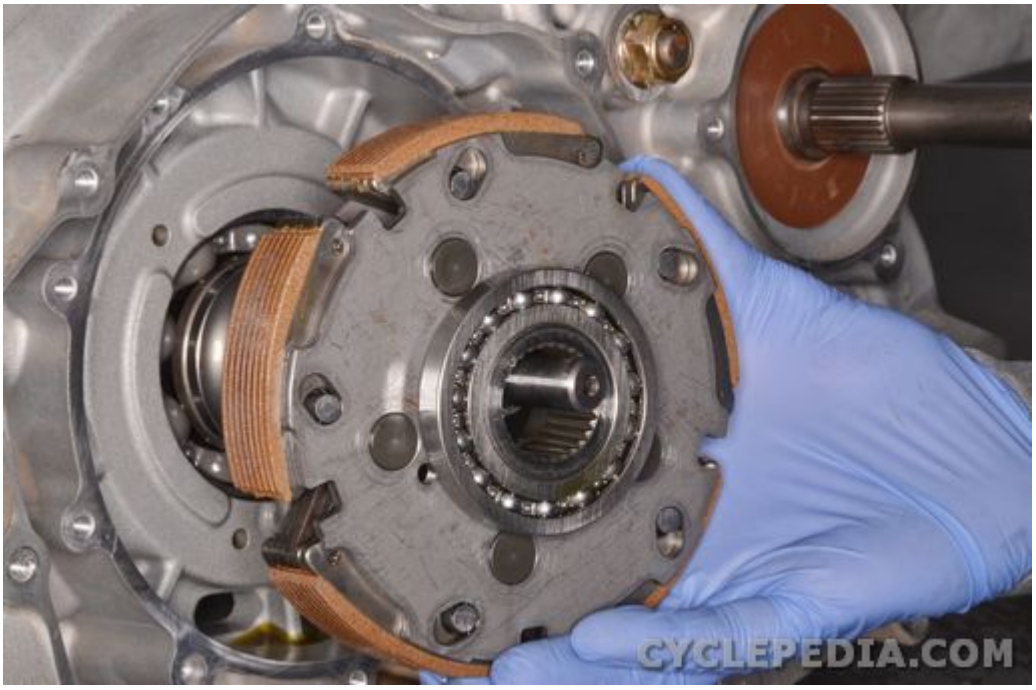


Fit the seal cover to the clutch cover with a new gasket. Install the four seal cover bolts and tighten them securely with an 8 mm socket.

Install the one-way clutch into the clutch outer if it was removed. Lubricate the one-way clutch bearings with molybdenum disulfide grease.

Apply a light coat lightweight lithium-soap based grease to the lips of the oil seal. Lubricate the clutch bearings with fresh engine oil. Fit the clutch outer into the clutch cover.

Lubricate the inner clutch collar with fresh engine oil and slide it onto the crankshaft as shown.



Slide the clutch onto the crankshaft. Be sure to align the splines.

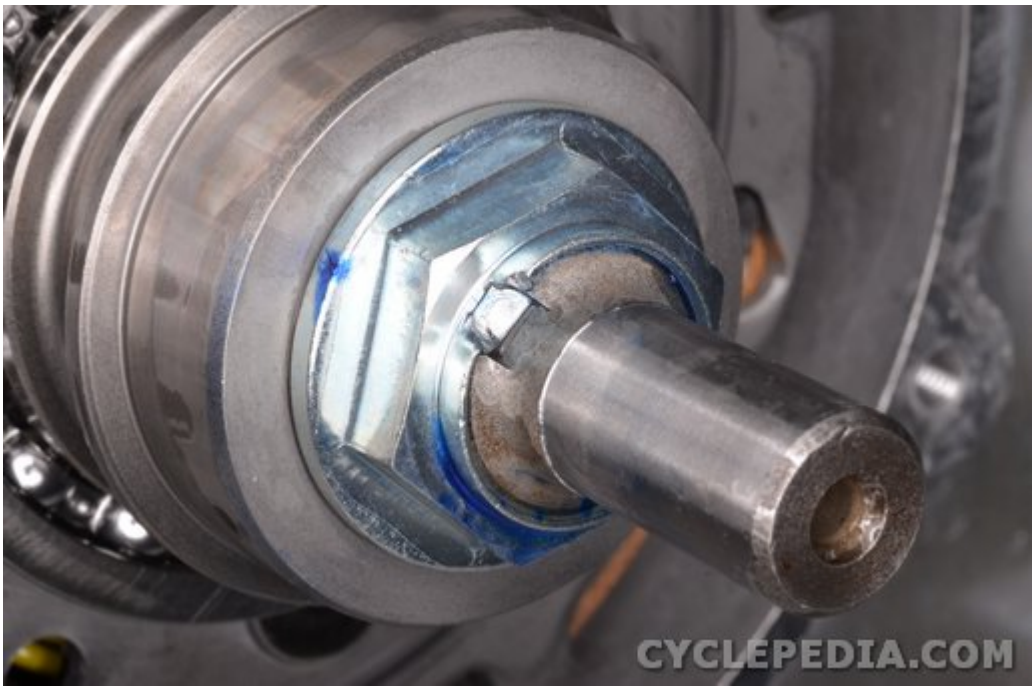
Slide the outer clutch collar onto the crankshaft.

Thread on a new clutch lock nut.

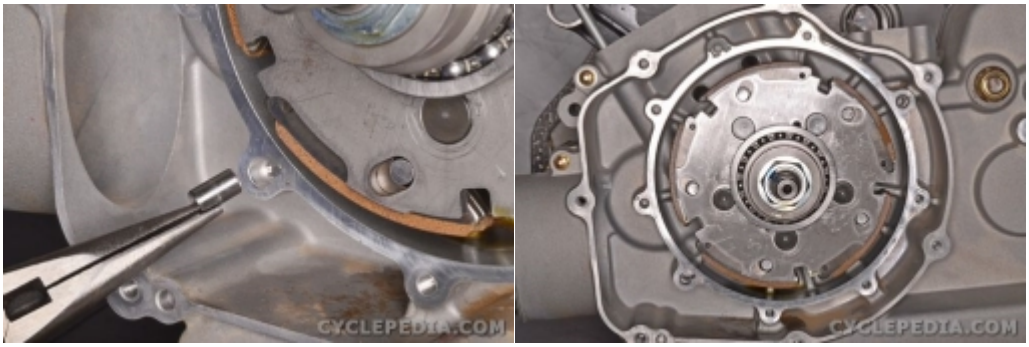
Hold the clutch with the Y-type holder and torque the clutch nut to specification with a deep well commercially available 26 mm socket.

Special Tool -
Y-Type Holder: A120E00056
Lock Nut Wrench: A120E00079

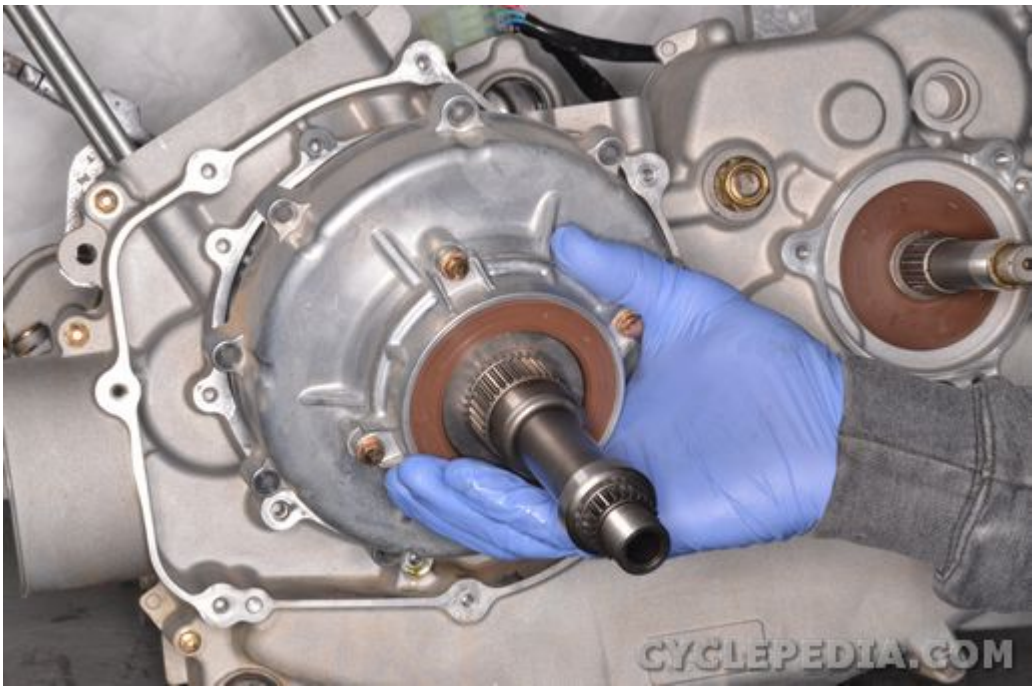
ITEM	THREAD SIZE AND TYPE	TORQUE VALUES		REMARKS
		N-m	ft-lb	
WET CLUTCH	M25 x 1.5	156.8	115.6	APPLY OIL



Stake the clutch nut at the groove on the crankshaft with a chisel and a hammer. Be careful to avoid damaging the threads.



Install the two dowel pins and a new clutch cover gasket.



Guide the clutch cover assembly into place evenly.

Insert the 9 clutch cover bolts.

Tighten the clutch cover bolts a little bit at a time in a crisscross pattern. Torque the bolts to specification with an 8 mm socket.

ITEM	N-m	kgf-m	ft-lb
Clutch cover bolt	10	1	7.2

Install the CVT pulleys and belt. See the CVT Installation topic for more information.

8.Final Drive

This chapter covers the location and servicing of the final drive components for the KYMCO MXU 700i and MXU 500i models.

1.Drive Shafts 8-3
2.Differential Removal 8-19
3.Differential Installation 8-23
4.Differential Disassembly 8-27
5.Differential Assembly 8-61
6.Rear Final Drive Gear 8-78
7.Final Drive Gear Disassembly 8-82
8.Final Drive Gear Assembly 8-111

GENERAL INSTRUCTIONS

- Too little backlash is extremely destructive to the gear teeth. If a test ride following reassembly indicates this condition, stop riding immediately to minimize gear damage.
- Stop riding immediately if broken gear teeth are suspected. This condition could result in the shaft drive assembly locking up, causing loss of control of the machine and possible injury to the rider.
- An apparent oil leak on a new or nearly new machine may be the result of a rust-preventative coating or excessive seal lubrication.
- Always clean the machine and recheck the suspected location of an apparent leakage.

TROUBLESHOOTING

1. A pronounced hesitation movement during acceleration, deceleration, or sustained speed. (This must not be confused with engine surging or transmission characteristics.)

2. A “rolling rumble” noticeable at low speed; a high-pitched whine from front drive component or area.

3. A locked-up condition of the shaft drive train mechanism, no power transmitted from the engine to the front and /or rear wheel.

- Bearing damage
- Improper backlash
- Gear tooth damage
- Broken propeller shaft
- Broken gear teeth
- Seizure due to lack of lubrication
- Small foreign objects lodged between the moving parts.

Drive Shafts

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Boot Inspection

Inspect the drive shaft protective boots for wear and damage. Replace the boots if they are damaged or punctured.

Removal

Remove these components	
Component	Topic
Wheels and hubs	Wheels and Wheel Hubs

Drain the gear oil	Final Drive Oil
Steering knuckles (front)	Steering Knuckles
Rear knuckles (rear)	Rear Suspension Arms

Remove the drive shaft horizontally. Repeat the procedure on the other side. Remove the circlips from the inside ends of the drive shafts.

Inspection

Check the axle for bends or damage. Check the boots and boot bands for any damage or excessive wear. Replace parts as needed.

Inspect the splines for wear or damage.

Push and pull on the axle shaft and wheel spindle to check the play in the axle.

Disassembly

Carefully remove the boot bands and discard.

Note: To remove the boot on the wheel side remove the boot on the case side first.

Pull the boot off the outer race.

Remove the stopper ring from the outer race with a flat head screwdriver.

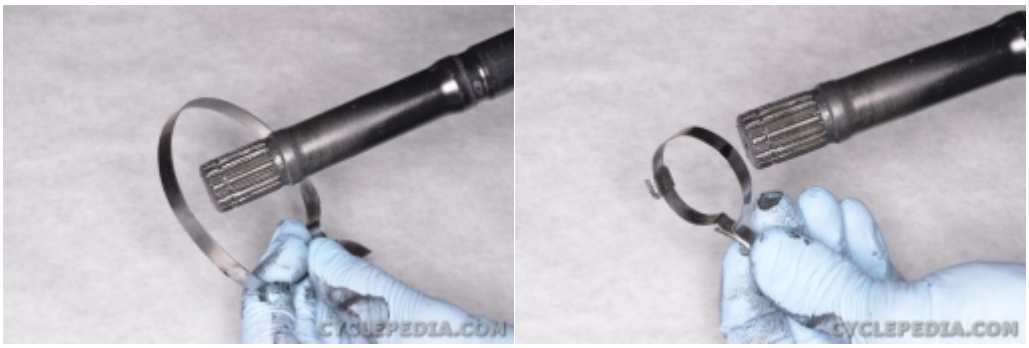
Remove the outer race.

Wipe off any grease and remove the snap ring with a pair of snap ring pliers.

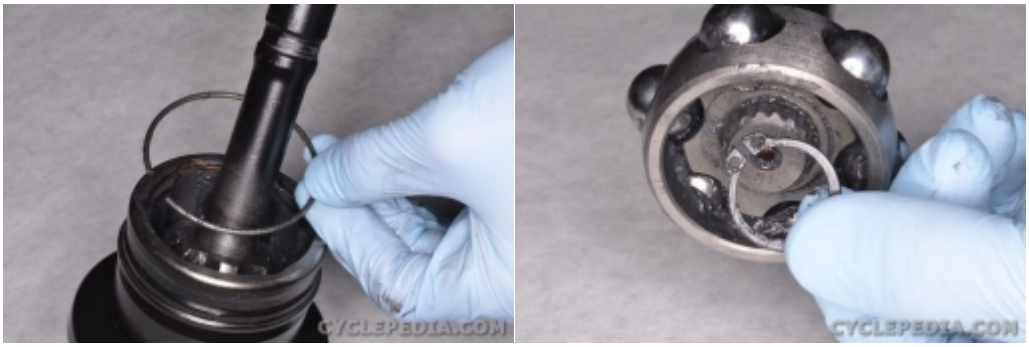
Carefully drive the shaft out of the cage.

Remove the cage and replace if needed.

Remove the stopper ring and boot. Clean the boot with a clean shop rag. Inspect the boots and replace if they are damaged.



Remove and discard all the boot bands.



Inspect the circlip and snap ring and outer race for wear or damage. If any damage is found, replace part(s) with new ones.

Inspect the cage and inner surface of case side joint for pitting, wear or damage. If any damages are found, replace them with new ones.

Wash all parts (except for the boots) before assembly, clean the inside and outside of the boot with a cloth. Do not wash the boots in any commercially available de-greaser, such as gasoline or kerosene. Washing in a de-greaser causes deterioration of the boot. Clean the boots with a clean shop rag.

Assembly

Install a new small boot band onto the shaft groove end.

Note: The end of the boot band should face away from the rotation of the drive shaft.

Fit a boot on the drive shaft end, fitting the small diameter side of the boot to the shaft groove. Fix its end with the small boot band.

Install the cage on the shaft with the large diameter side facing the shaft end.

Install the snap ring into the groove with a pair of snap ring pliers.

Apply molybdenum disulfide grease to the entire surface of the cage and the inside of the case side joint/wheel side joint.

	Location	
	Wheel Side Joint	Case Side Joint
Quantity of Grease	45 g (1.5 oz)	85 g (2.8 oz)

Note: The tube of joint molybdenum disulfide grease is included in the wheel side boot set or wheel side joint assembly of spare parts.

Insert the cage into the case side joint (outer race).

Install the stopper ring in the groove of the case side.

Note: Locate the opening of the circlip so that the opening is not lined up with any ball in the cage.

After fitting the boot on the case side joint, insert a screw driver into the boot on the case side joint and allow air to enter the boot so that the air pressure in the boot becomes the same as the atmospheric pressure.

Fix the boot on the case side joint with a new boot band, taking care not distort the boot.

Note: The end of the boot band should face away from the rotation of the drive shaft.

Note: The dust boots should be fastened with the boot bands at the grooves in the drive shaft.

Installation

Insert a new stopper ring into the groove in the shaft splines. Lightly coat the drive shaft ends with grease. Install the differential end of the drive shaft.

Note: Be careful not to damage the oil seal in the gear case. After installing check the circlip is seated properly by pulling the case side joint lightly.

Install these components	
Component	Topic
Rear knuckles (rear)	Rear Suspension Arms
Steering knuckles (front)	Steering Knuckles
Fill the gear oil	Final Drive Oil
Wheels and hubs	Wheels and Wheel Hubs

Differential Removal and Installation

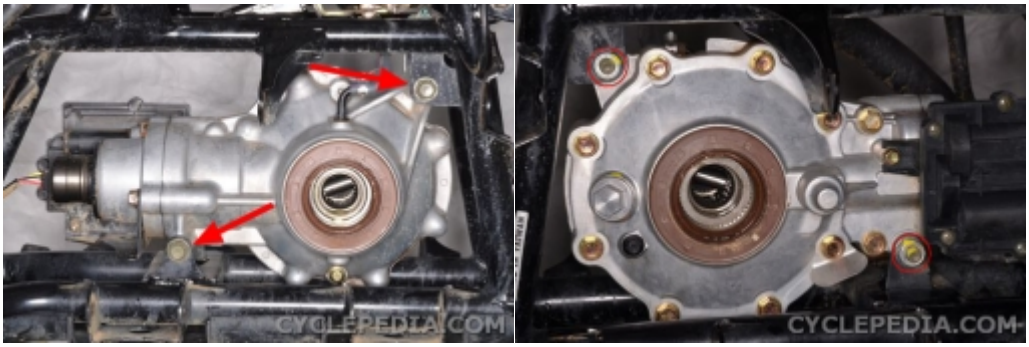
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Front rack	Racks
Side covers	Side Covers
Fuel tank	Fuel Tank
Mudguards	Mudguards and Footrests
Front fender	Front Fender
Front wheels	Wheels and Wheel Hubs
Front A-arms (front)	A-arms
Drive shafts	Drive Shafts
Drain the front gear oil	Final Drive Oil

Unplug the 2WD/4WD shifting motor connector. Free the wires from the wire band on the frame.

Inspect the breather hose and case for damage. Squeeze and slide back the clamp to remove the breather hose and case.



Hold the differential mounting bolts and loosen the nuts. Remove the two differential mounting nuts and bolts.

Disconnect the front propeller shaft from the differential.

Inspect the splines. Take care to not lose the spring. Check that the U-joints move smoothly. Replace as needed.

Remove the differential from the frame.

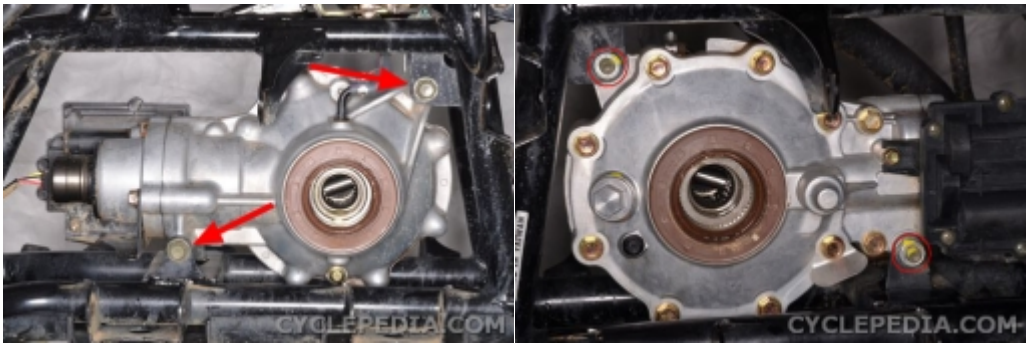
To disassemble the front differential see the Differential Disassembly topic for more information.

Installation

Install the differential onto the vehicle.

Lubricate the splines of the propeller shaft with water-proof grease. Make sure the spring fits between the propeller shaft and the differential.

Install the propeller shaft between the engine and the differential. Fit the rubber boot into place so that it rides on the differential yoke and the propeller shaft.



Install the two differential nuts and bolts. Hold the bolts and tighten the nuts to specification.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear gear case and frame	10	5.3 (53, 38)

Install the breather hose and case. Secure the hose with the clamp.

Plug in the 2WD/4WD shifting motor connector. Secure the wires to the frame with the wire band.

Install these components	
Drive shafts	Drive Shafts
Front A-arms (front)	A-arms

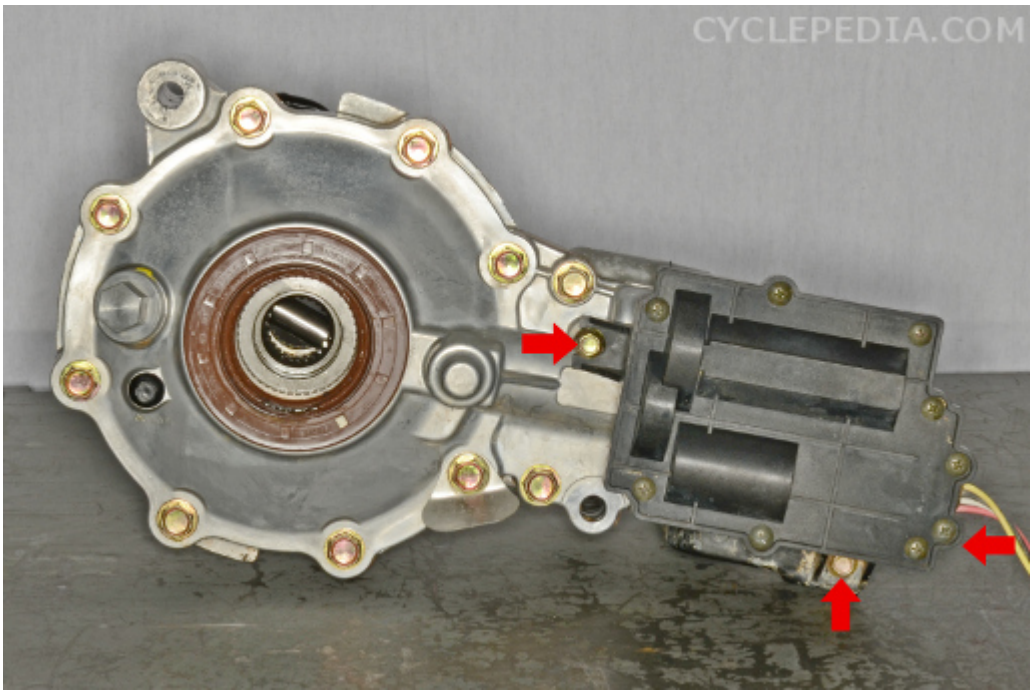
Fill the differential oil	Final Drive Oil
Front Wheels	Wheels
Front fender	Front Fender
Mudguards	Mudguards and Footrests
Fuel tank	Fuel Tank
Side covers	Side Covers
Front rack	Racks

Differential Disassembly

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

2WD/4WD Shifting Motor Assembly

To test the 2WD/4WD shifting motor assembly see the Switches topic.



The 2WD/4WD shifting motor assembly is mounted to the front differential with three bolts.

Remove the 2WD/4WD shifting motor assembly bolts.

Remove the cap.

The 2WD/4WD shifting rod is held in place by a small circlip.

Carefully spread the circlip and remove it.

Remove the spacer.

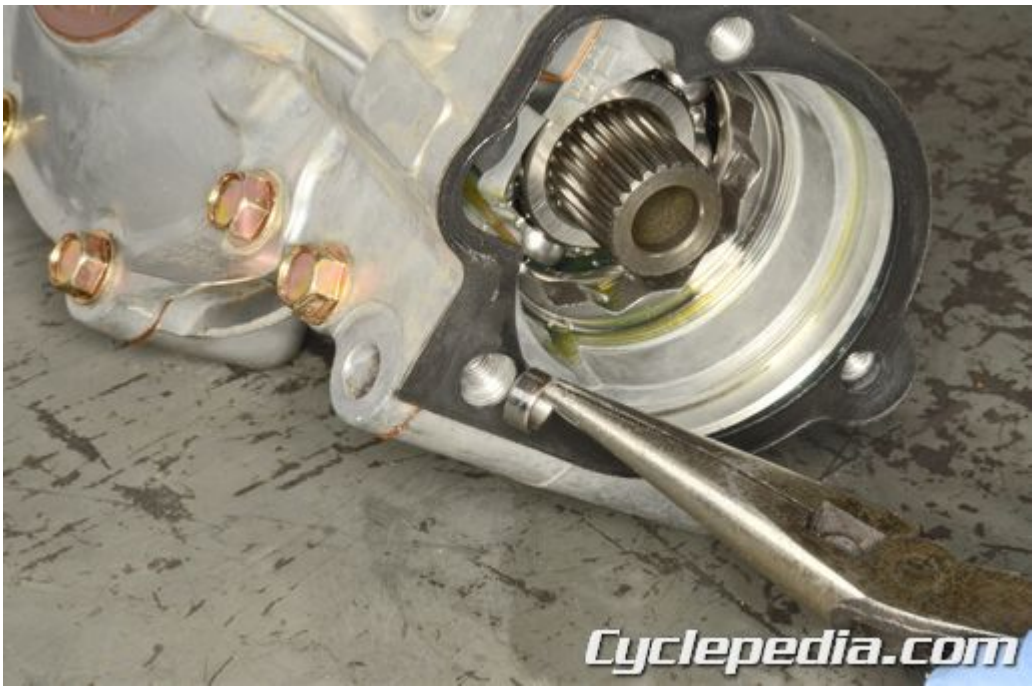
Slide the 2WD/4WD shifting motor assembly back and free it from the actuator fork rod. Remove the 2WD/4WD shifting motor assembly.

Pinion Housing

Remove the three pinion housing bolts with a 12 mm socket.

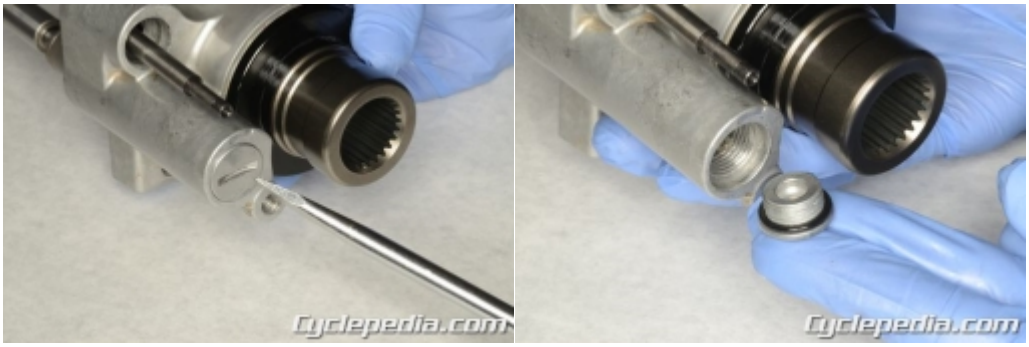
Remove the bracket.

Remove the pinion housing.

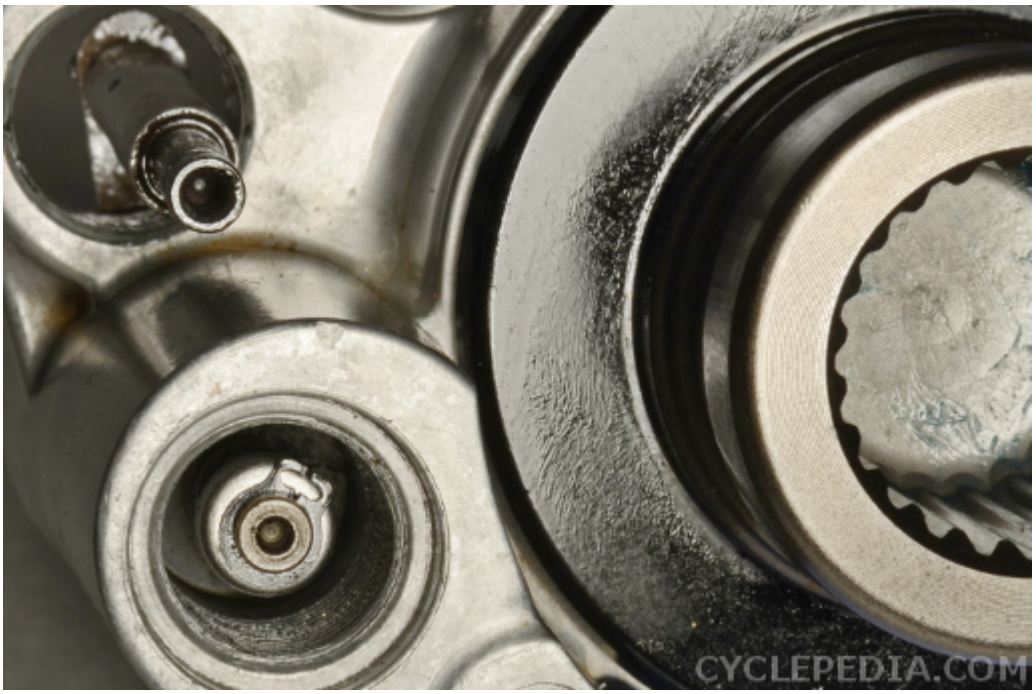


Remove the dowel pin.

Remove the gasket.



To remove the 2WD/4WD shifting and locking components remove the plug with a large flat blade screwdriver. Inspect the O-ring and replace it as needed.



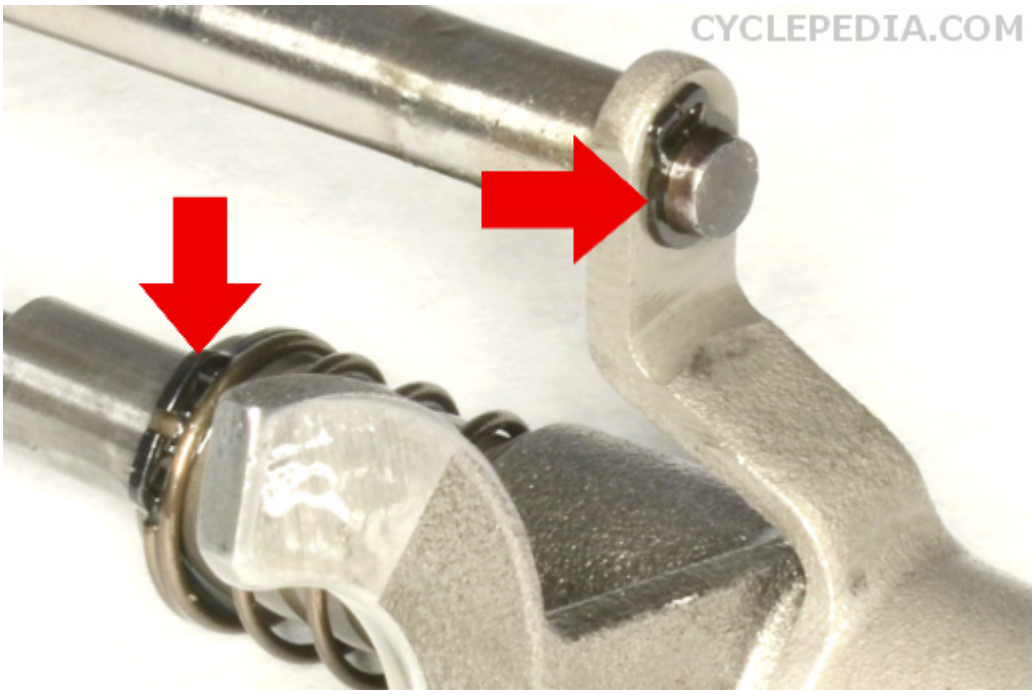
The differential locking shaft is held in place by a small circlip. Carefully spread the circlip and remove it.

Remove the circlip, spring seat, and spring.

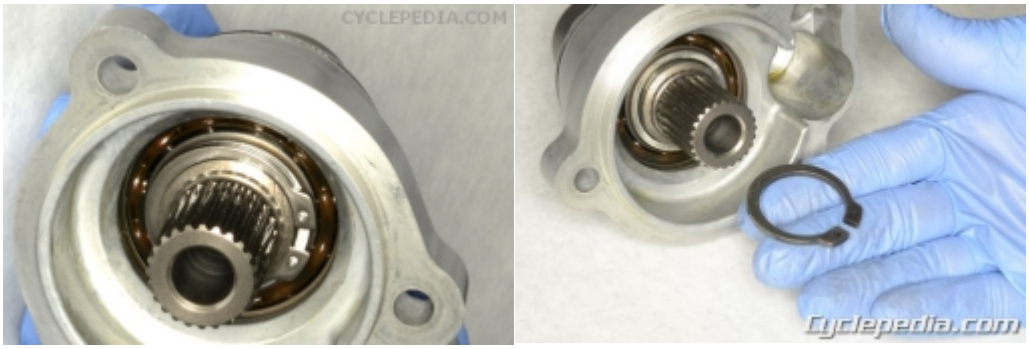
Slide the 2WD/4WD shifting and locking components out of the pinion housing.

Remove the drive coupler from the fork. Inspect the drive coupler for wear and damage.

Inspect the 2WD/4WD shifting and locking rod components for wear and damage.



To disassemble the individual components of the 2WD/4WD shifting and locking assembly remove the two snap rings with snap ring pliers.



To remove the input shaft remove the snap ring with snap ring pliers.

Remove the input shaft from the pinion housing. Check the input shaft splines for wear and damage. Inspect the input shaft seals and replace as needed.

Bearing replacement

Inspect the pinion housing seal and bearing.

If the bearing or seal needs to be replaced remove the seal with a seal pick.

Remove the snap ring with snap ring pliers.

Drive the bearing out from the inside of the housing.

Drive in the new bearings with a suitable bearing driver that has the same outside diameter of the bearing. The manufactures markings on the bearing must face out.

Special Tool - Bearing Driver: A120E00014

Secure the new bearing by installing a new snap ring into the groove with snap ring pliers.

Apply waterproof grease to the lips of the new seal. Press in the seal with a suitable driver that has the same outside diameter as the seal.

Differential

Loosen the 10 differential cover bolts evenly with a 12 mm socket.

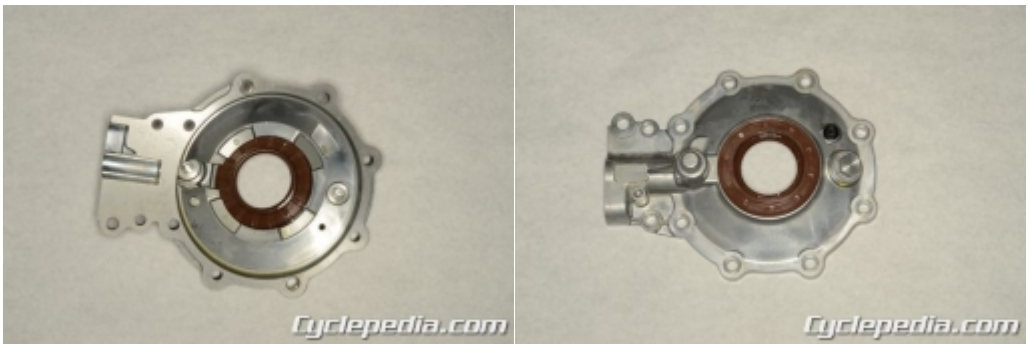
Remove the differential cover bolts.

Utilize the pry points and separate the cover from the differential case.

Remove the differential cover from the case.

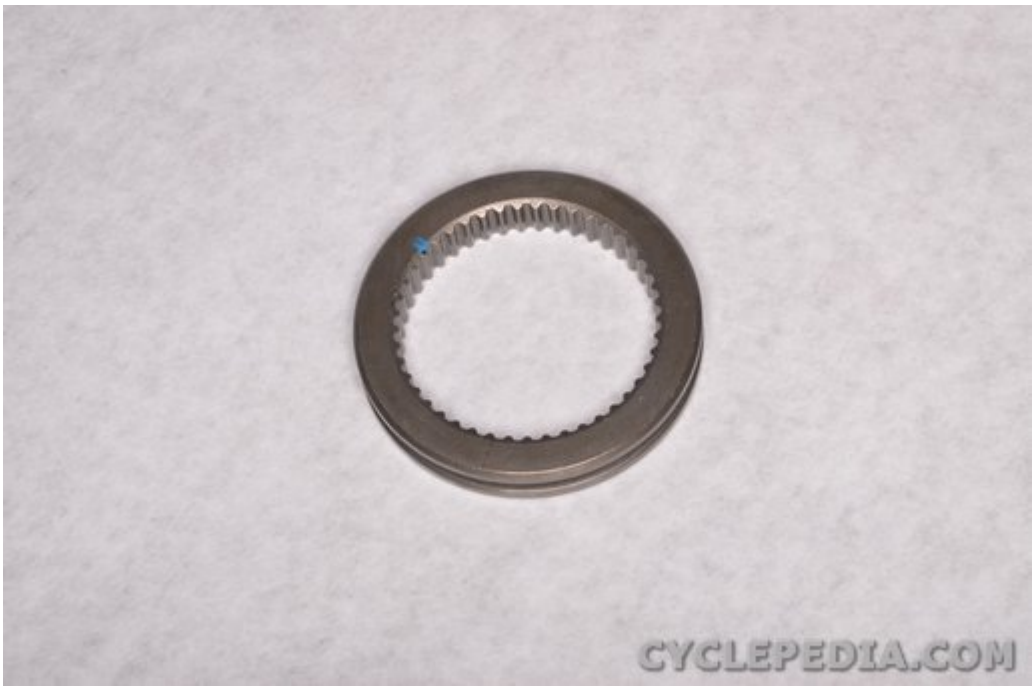
Remove the gasket.

Remove the dowel pins.



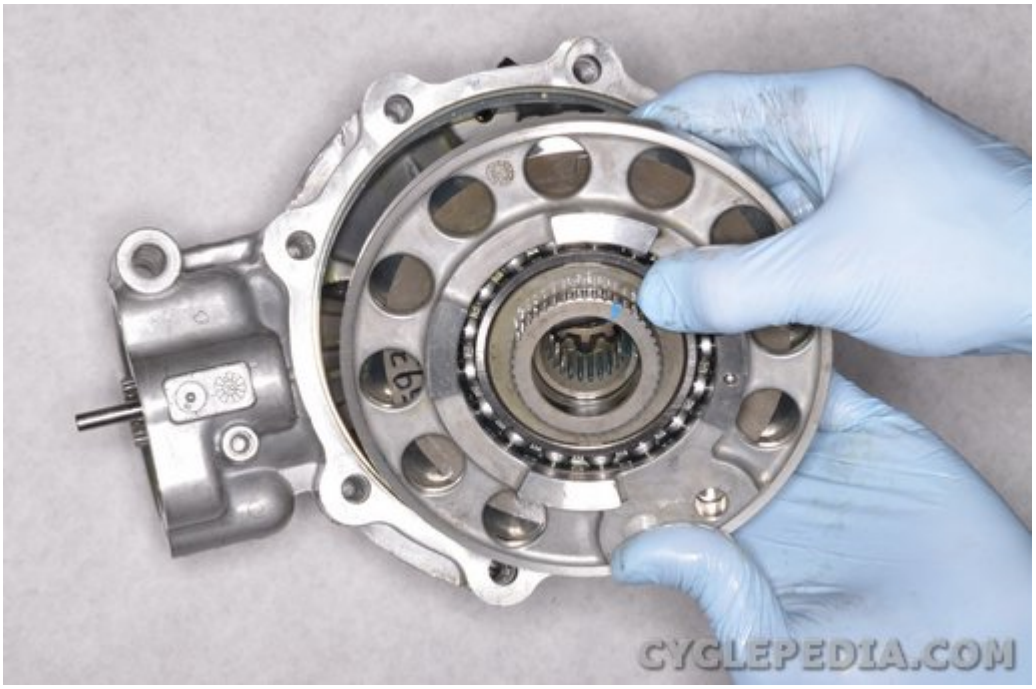
Inspect the differential cover seals. Replace them as needed. Apply waterproof grease to the lips of the new seals. Press in the seal with a suitable driver that has the same outside diameter as the seal.

Remove the differential locking fork and collar.



Inspect the differential locking fork and collar for wear and damage.

Use a suitable driver and tap out the ring gear assembly.



Remove the ring gear assembly from the differential case.

Lift off the bearing plate.

Inspect the bearing plate bearing and replace it as needed. Drive in the new bearing with a suitable bearing driver that has the same outside diameter of the bearing. The manufactures markings on the bearing must face out.

Remove the shims from each side of the ring gear. Keep track of the location of the shims so that they can be returned to their original positions.

Inspect the ring gear for wear and damage.

Inspect the differential case bearing and seal. Remove the seal with a seal pick if needed.

Drive the bearing out from the outside if needed.

Drive in the new bearing with a suitable bearing driver that has the same outside diameter of the bearing. The manufactures markings on the bearing must face out.

Pinion Gear

Unstake the pinion gear locknut with a suitable punch or a drill. Be very careful to avoid damaging the differential case.

Place the differential case in a vice. Use soft jaws or other suitable method to prevent damage to the differential case and its mating surface. Loosen pinion gear nut with the special lock nut wrench.

Special Tool - Bearing Driver: A120F00025

Remove the pinion gear nut.

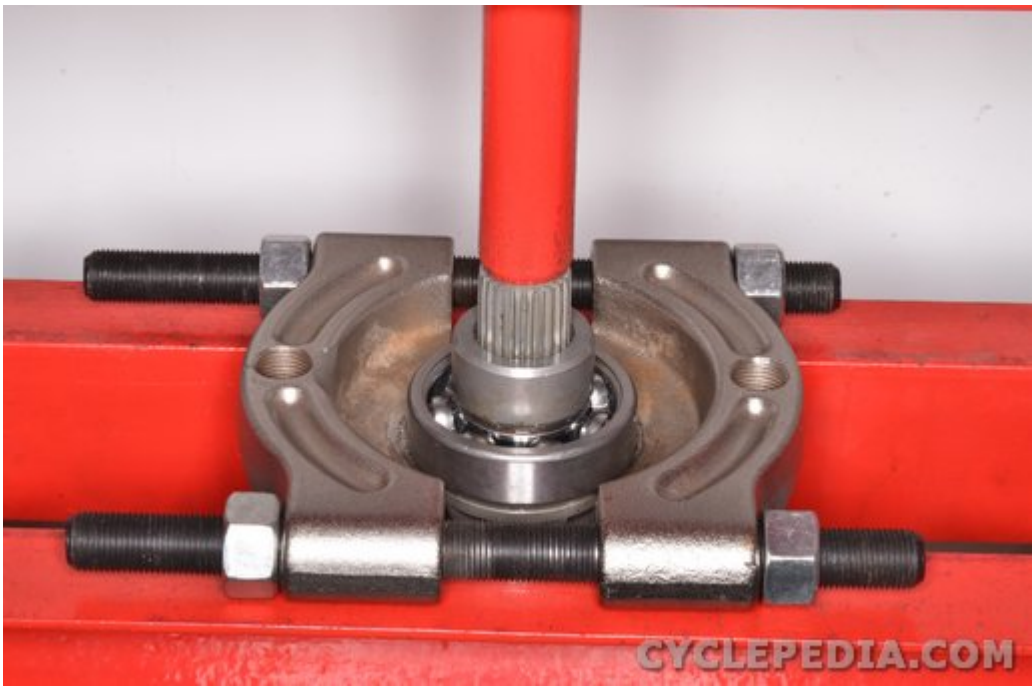
Drive out the pinion gear shaft with a suitable punt or drift with a hammer.

Remove the pinion gear and ball bearing from the differential case.

Inspect the pinion gear, shaft, and ball bearing. Replace the parts as needed.

Pinion Gear Shaft Bearings

Use a commercially available bearing puller to free the ball bearing from the pinion gear shaft.



Use a press and a split bearing puller if available.

Remove the ball bearing, and spacer from the pinion gear shaft.

Use a press to install the new bearing and spacer onto the pinion gear shaft.

Inspect the pinion gear shaft needle bearing in the differential case.

Remove the pinion gear needle bearing with a suitable bearing puller.

Drive in a new pinion gear needle bearing with a suitable bearing driver that is the same outside diameter as the bearing.

Backlash Inspection and Shim Adjustment

Temporarily assemble the differential with the shims.

Hold the pinion gear so that it doesn't move. Place a horizontal type dial gauge through the filler hole and against the ring gear of the differential. Rotate the differential back and forth and check the backlash. Check the backlash at three different evenly spaced sections of the differential ring gear.

ITEM	STANDARD mm (in)
Front drive (differential) gear backlash	0.05 - 0.25 (0.002 - 0.010)

If the backlash is out of specification the shim/s must be adjusted.

Backlash	Right Shim adjustment
Under 0.05 mm (0.0020 in)	increase shim thickness
0.05 - 0.25 mm (0.002 - 0.010 in)	Correct
Over 0.25 mm (0.010 in)	Decrease shim thickness

If the right shim is changed the left shim/s needs to change to compensate.

Gear Tooth Contact

After the proper shims have been selected the gear tooth contact must be checked.

Remove the differential and pinion gear. Clean the differential ring gear and pinion gear.

Apply machinists dye to several teeth of the pinion gear. Install the pinion gear and differential into the case. Temporarily assemble the differential.

Turn the differential ring gear back and forth so the dye coated gear teeth contact the ring gear.

The dye should show that the contact area of the gear teeth is centered on the teeth. If the contact is too high or low on the teeth the differential shims must be changed so that the tooth contact is correct while maintaining the correct backlash.

To assemble the front differential see the Differential Assembly topic.

Differential Assembly

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Clean the final drive gear case components with a high flash point solvent and compressed air.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

Lubricate the bearings with fresh gear oil.

Pinion Gear

Install the pinion gear shaft into the differential case.

Install a new pinion gear locknut.

Place the differential case in a vice. Use soft jaws or other suitable method to prevent damage to the differential case and its mating surface. Tighten the pinion gear nut to specification with the special locknut wrench.

Special Tool - Bearing Driver: A120F00025

ITEM	N-m	kgf-m	ft-lb
Front drive (differential) pinion gear shaft nut	169	16.9	125

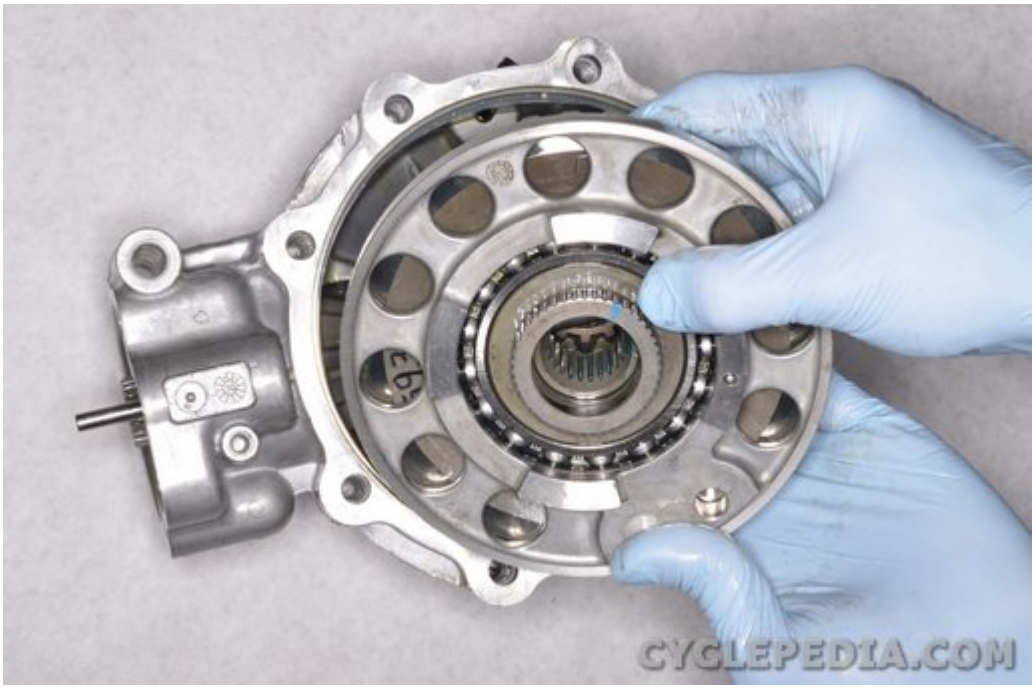
Stake the pinion gear locknut with a suitable punch and hammer. Be very careful to avoid damaging the differential case.

Differential

Select the proper shims as covered in the Differential Disassembly topic.

Install the correct shims onto each side of the ring gear.

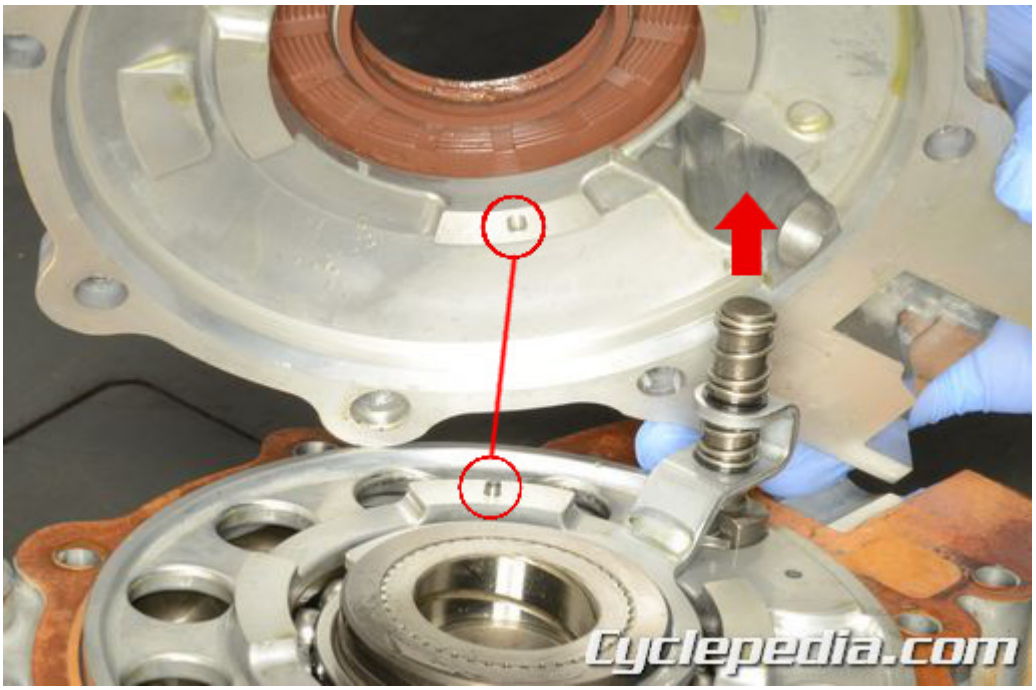
Fit the bearing plate into place as shown.



Fit the ring gear assembly and bearing plate into the differential case.

Install the differential locking fork and collar.

Install the dowel pins and a new gasket.



Fit the differential cover into place. The pin on the bearing plate must fit into the differential cover. The locking fork projection must fit into the space in the cover.

Apply a light coat of Threebond 1215 or other equivalent sealant to the threads of the differential cover bolts. Install the differential cover bolts.

Tighten the differential cover bolts evenly and securely with a 12 mm socket.

ITEM	N-m	kgf-m	ft-lb
Front drive (differential) case bolt	23	2.3	16.5

Pinion Housing

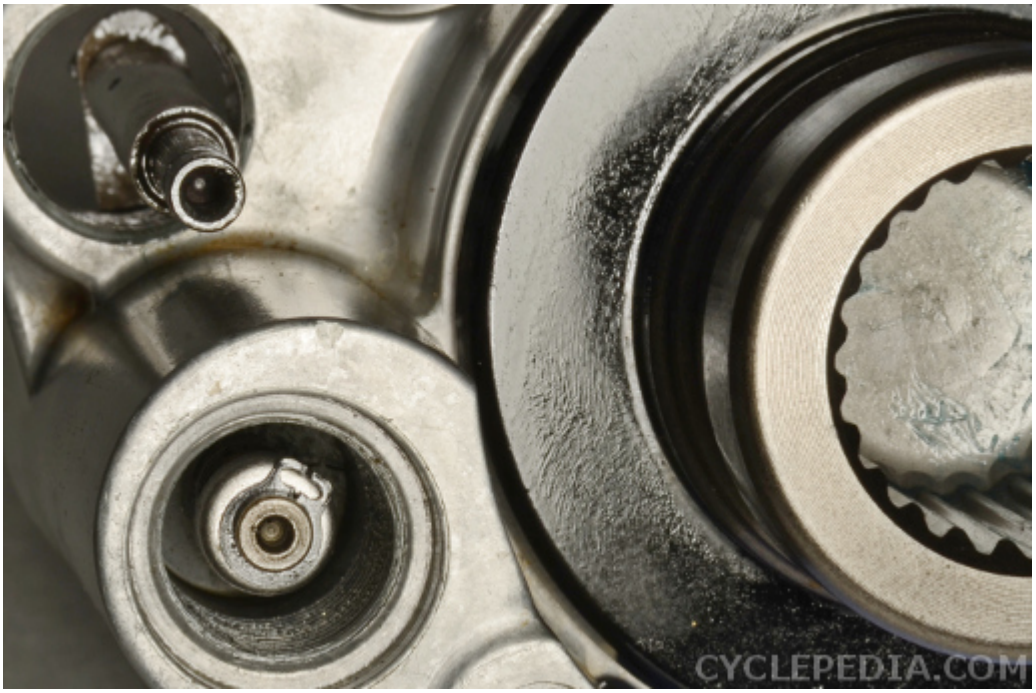
Install the input shaft into the bearing.

Install the snap ring into the groove with snap ring pliers.

Lubricate the actuator fork and drive coupler with fresh differential oil. Fit the drive coupler into the fork as shown.

Slide the 2WD/4WD shifting and locking components into the pinion housing.

Install the spring, spring seat and circlip onto the locking shaft.



Gently spread the circlip and slide it into place in the groove on the shaft.

Install the plug. Make sure the O-ring is in good condition. Tighten the plug securely with a large flat blade screwdriver.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Shifting fork shaft plug	1	8	1.5 (15, 11)

Install a new pinion housing gasket and dowel pin.

Fit the pinion housing into place.

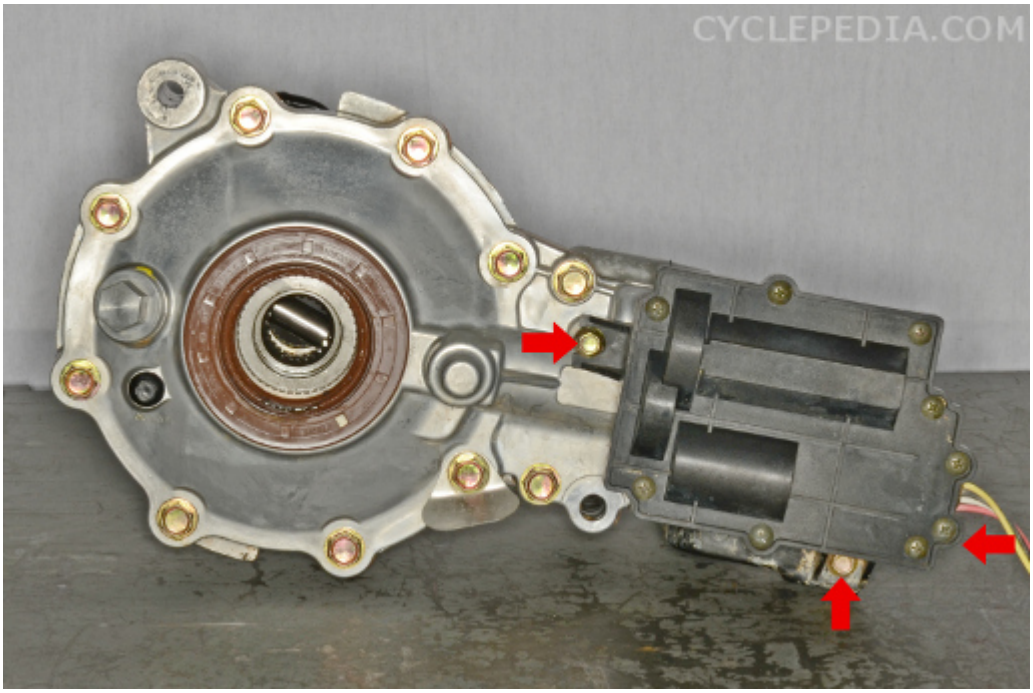
Apply a light coat of Threebond 1215 or other equivalent sealant to the threads of the pinion housing bolts. Install the bracket and the three pinion housing bolts.

Tighten the pinion housing bolts securely with a 12 mm socket.

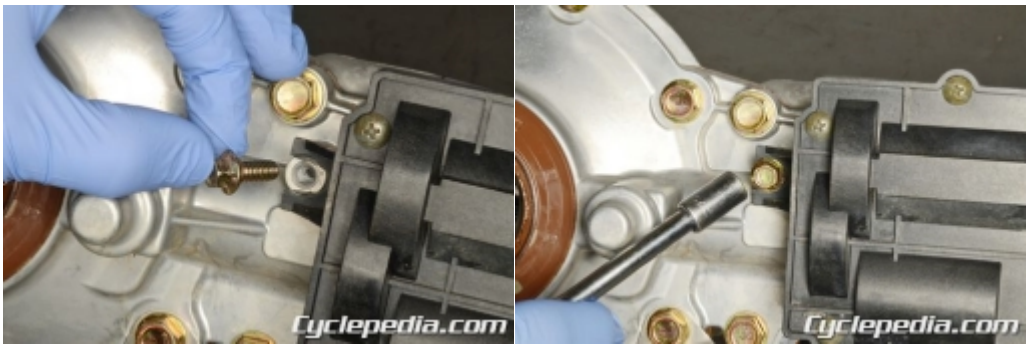
2WD/4WD Shifting Motor Assembly

Lubricate the shifting motor assembly O-ring with grease.

Install the 2WD/4WD shifting motor assembly. Guide the rod into the shifting motor assembly.



Apply Threebond sealant to the threads of the 2WD/4WD shifting motor assembly mounting bolts. The install the three 2WD/4WD shifting motor assembly mounting bolts.



Tighten the 2WD/4WD shifting motor assembly bolts to specification.

Item	Q'ty	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)	Remarks
2WD/4WD shift motor mounting bolt	1	8	2.3 (23, 16.5)	Apply threebond: 1215
2WD/4WD shift motor mounting bolt	2	6	1.2 (12, 8.5)	

Install the spacer onto the 2WD/4WD shifting rod.

Carefully spread the circlip and install it into the groove in the 2WD/4WD shifting rod.

Apply a light coat of silicone sealant to the outside of the plug and install the plug.

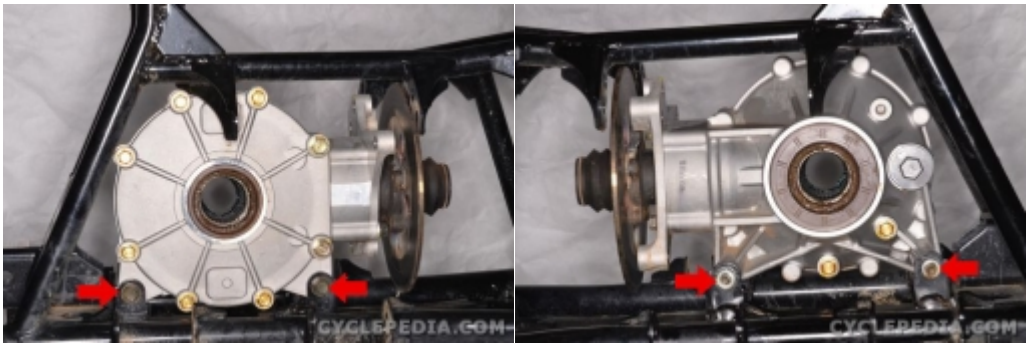
Install the differential. See the Differential Removal and Installation topic for more information.

Rear Final Drive Gear

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Rear wheels	Wheels and Wheel Hubs
Rear knuckles and suspension arms	Rear Suspension Arms
Drive shafts	Drive Shafts
Drain the rear gear oil	Final Drive Oil
Remove the rear brake calipers	Rear Brake Calipers



Hold the rear final gear case mounting bolts and loosen the nuts. Remove the two mounting nuts and bolts.

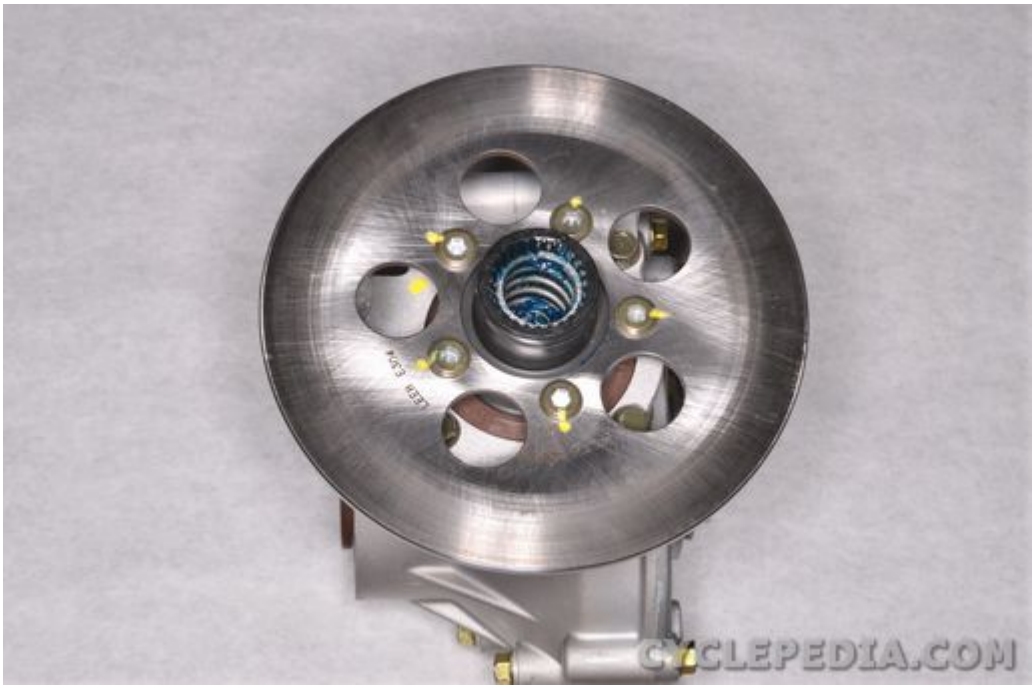
Free the rear propeller shaft from the final drive unit.

Remove the rear final gear case from the frame.

To remove the brake disc see the Brake Discs topic.

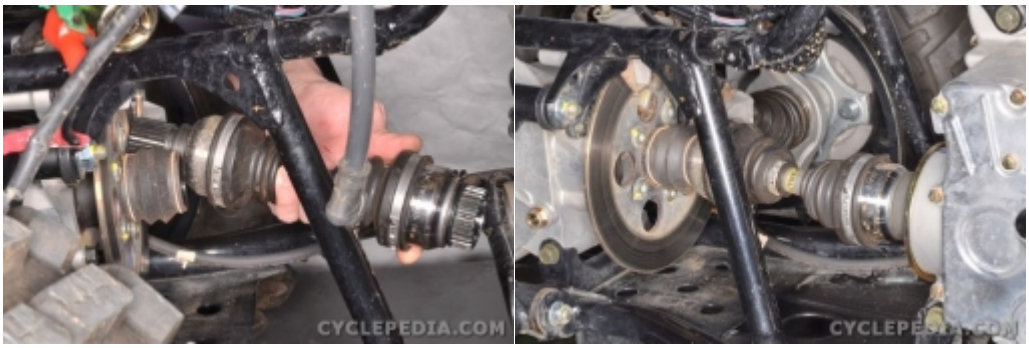
To disassemble the rear final drive unit see the Final Drive Gear Disassembly topic.

Installation

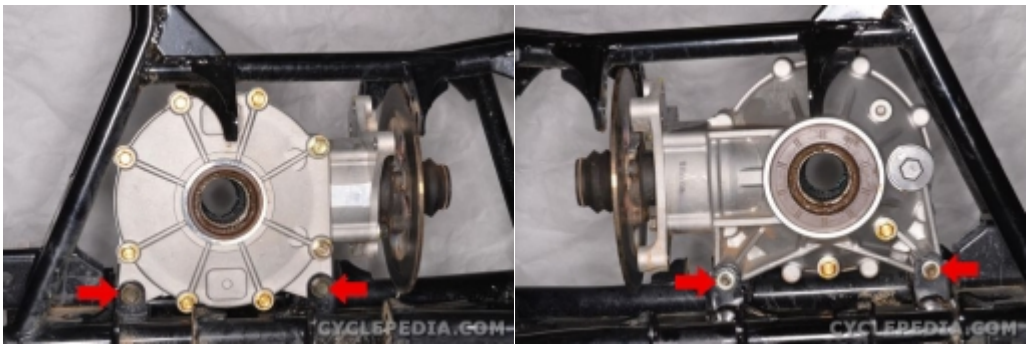


Apply grease to the splines of the propeller shaft. Make sure the propeller shaft spring is in place as shown.

Install the rear final drive unit into the frame.



Install the rear propeller shaft.



Install the two gear case mounting bolts and nuts. Hold the bolts with a 14 mm wrench and tighten the nuts to specification with a 17 mm socket.

Item	N-m	Kgf-m	lbf-ft
Rear gear case mounting bolt	55	5.5	40

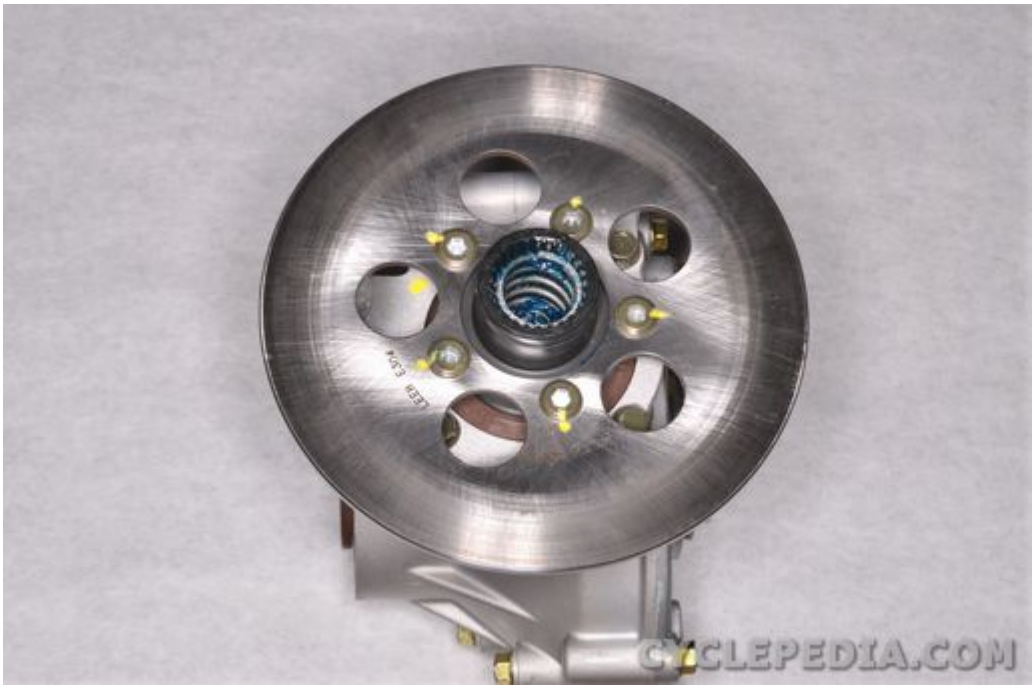
Install these components	
Rear brake calipers	Rear Brake Calipers
Drive shafts	Drive Shafts
Rear knuckles and suspension arms	Rear Suspension Arms
Fill the rear gear oil	Final Drive Oil
Rear wheels	Wheels and Wheel Hubs

Final Drive Gear Disassembly

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Remove the rear final drive. See the Rear Final Drive Gear topic for more information.

Rear Brake Disc and Holder



Remove the five rear brake disc bolts with a 6 mm Allen socket.

Remove the rear brake disc from the brake disc holder.

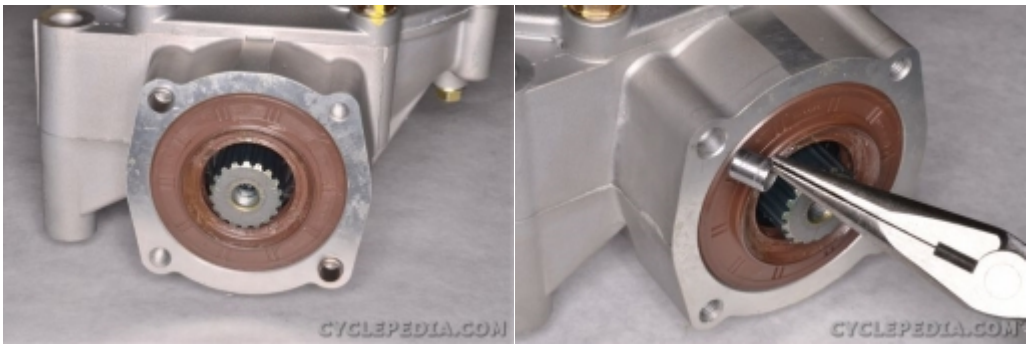
Remove the spring from the brake disc holder.

Loosen the rear brake disc holder bolt with a 14 mm socket.

Remove the rear brake disc holder from the pinion shaft.

Loosen the four rear brake caliper holder bolts with a 12 mm socket. Remove the four rear brake caliper holder bolts. Note there are two different sizes for the rear brake caliper holder bolts.

Remove the rear brake caliper holder.



Remove the two dowel pins.

Backlash Inspection and Shim Adjustment

Temporarily assemble the rear final gear with the shims.

Hold the pinion gear so that it doesn't move. Place a horizontal type dial gauge through the filler hole and against the ring gear of the differential. Rotate the

pinion gear shaft back and forth and check the backlash. Check the backlash at three different evenly spaced sections of the ring gear.

ITEM	STANDARD mm (in)
Rear final drive gear backlash	0.05 - 0.25 (0.002 - 0.010)

If the backlash is out of specification the shim/s must be adjusted.

Backlash	Right Shim adjustment
Under 0.05 mm (0.0020 in)	increase shim thickness
0.05 - 0.25 mm (0.002 - 0.010 in)	Correct
Over 0.25 mm (0.010 in)	Decrease shim thickness

If the right shim is changed, the left shim/s needs to change to compensate.

Gear Tooth Contact

After the proper shims have been selected the gear tooth contact must be checked.

Remove the final drive gears. Clean the differential ring gear and pinion gear.

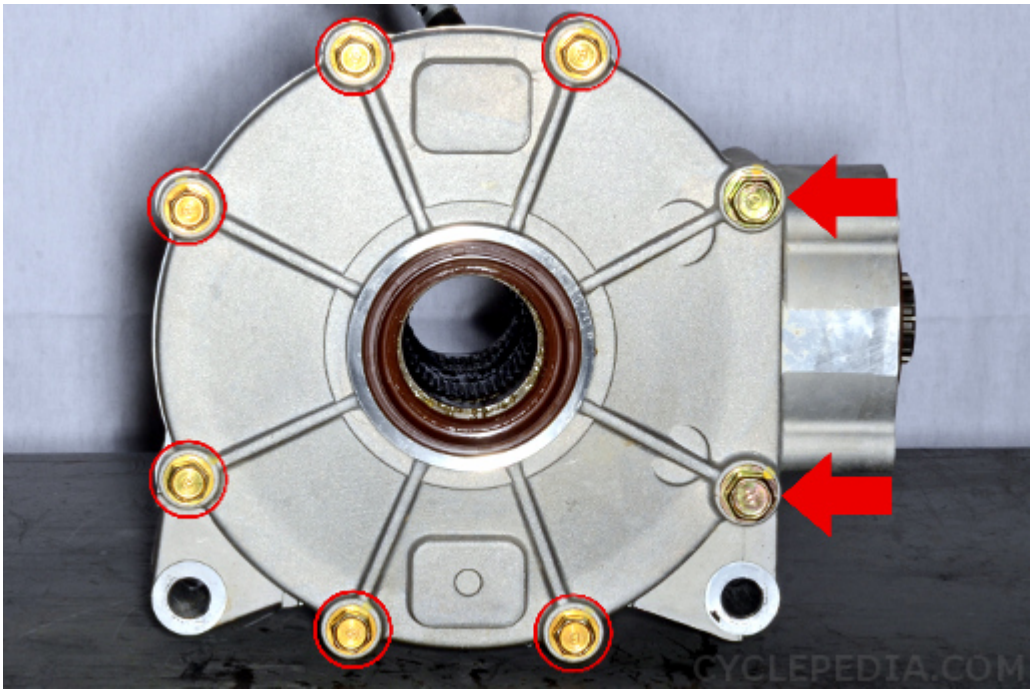
Apply machinists dye to several teeth of the pinion gear. Install the pinion gear and ring gear into the case. Temporarily assemble the final drive gear case.

Turn the ring gear back and forth so the dye coated gear teeth contact the ring gear.

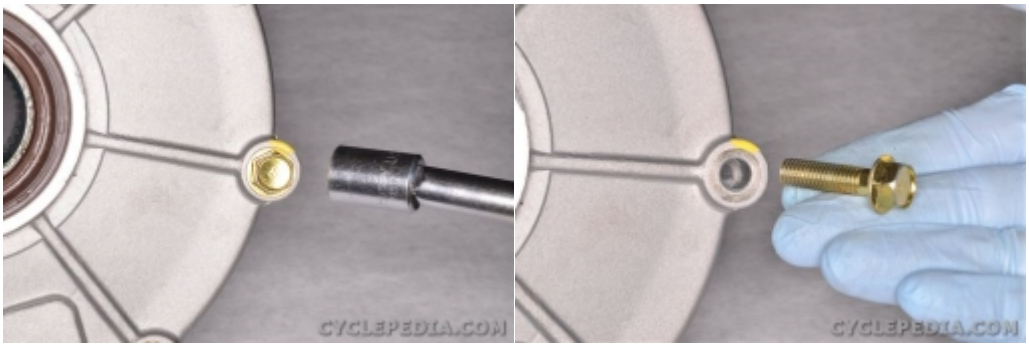
The dye should show the contact area of the gear teeth is centered on the teeth. If the contact is too high or low on the teeth the pinion gear shaft shims must be changed so that the tooth contact is correct while maintaining the correct backlash.

Final Gear Case Cover

Squeeze the clamp and free the breather vent tube from the rear final drive gear case.



The rear final drive cover has eight bolts. There are two large bolts (arrows) and six small bolts (circles).



Loosen the small bolts with a 12 mm socket.

Remove the two large bolts with a 14 mm socket.

Utilize the pry point and remove the rear final gear case cover.

Ring and Pinion Gears

Remove the ring gear.

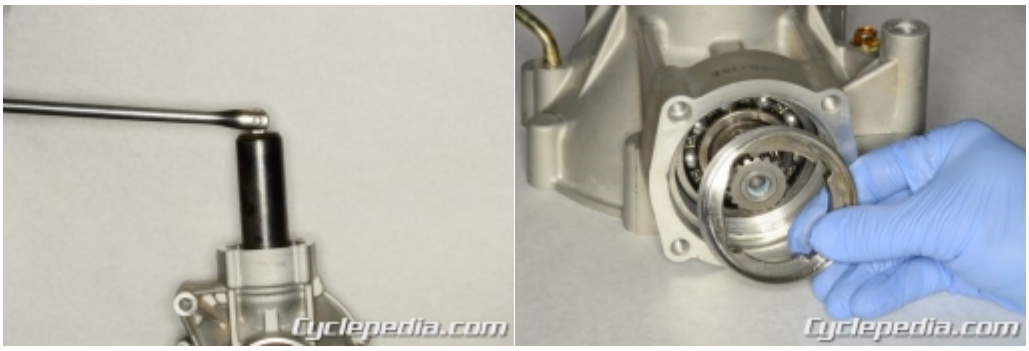
Remove the shims from each side of the ring gear. Keep track of the location of the shims so that they can be returned to their original positions.

Inspect the ring and pinion gears for wear and damage.

If the pinion gear shaft needs to be removed the oil seal must be removed first. Remove the pinion shaft oil seal with a seal pick.

The pinion gear shaft has a locknut that requires a special tool to remove. Also, a special puller tool will be needed to pull the pinion gear out of the final gear case.

Place the final gear case in a vice. Use soft jaws or other suitable method to prevent damage to the case and its mating surface.



Secure the case in a soft jawed vise and remove the locknut with the special wrench.

Special Tool - Pinion Gear Shaft Puller: A120F00020

To remove the pinion shaft a special tool set is needed.

Special Tool - Pinion Gear Shaft Puller: A120F00026

Lubricate the puller threads with grease.

Thread the puller part of the tool into the pinion gear shaft.

Install the puller plate onto the final gear case.

Thread the shaft onto the puller.

Install the rest of the tool.

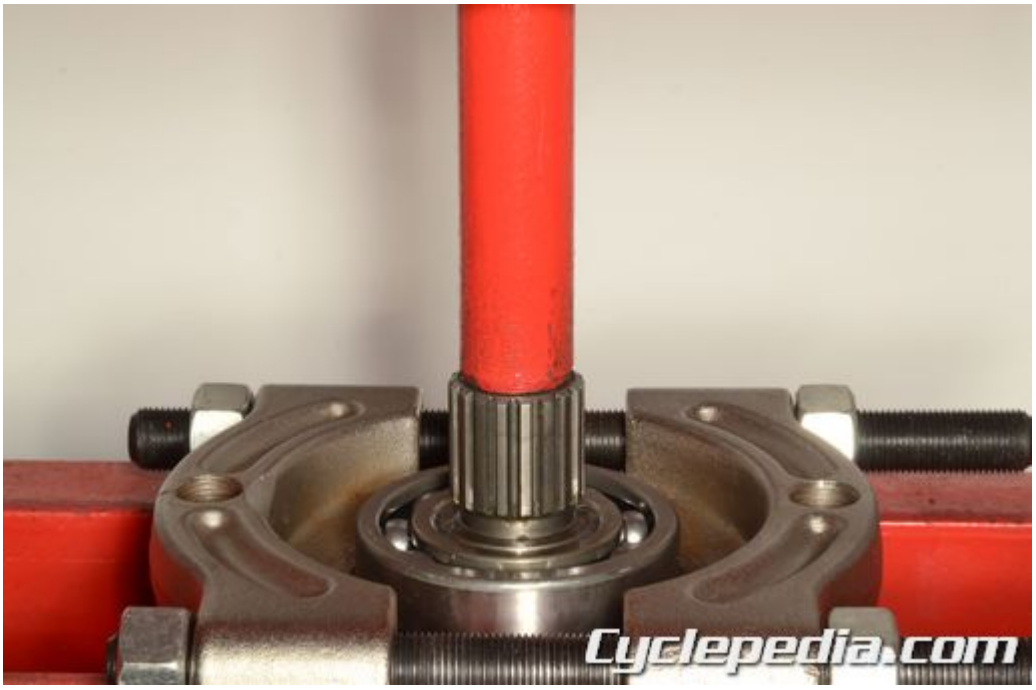
Hold the shaft still and turn the nut with a large wrench to pull the shaft up.

Remove the pinion gear shaft from the case.

Inspect the pinion shaft, gear, and bearing for wear and damage. The bearing must be removed to access the shim.

Bearing Replacement

Pinion Bearing



Use a commercially available bearing puller or press to free the ball bearing from the pinion gear shaft.

Remove the shim. Be sure to have the appropriate shim for installation.

Install the shim and press the new bearing onto the shaft.

Final Gear Case Pinion Gear Needle Bearing

Inspect the pinion gear shaft needle bearing in the case.

Remove the needle bearing snap ring with snap ring pliers.

Remove the pinion gear needle bearing with a suitable bearing puller.

Drive in a new pinion gear needle bearing with a suitable bearing driver that is the same outside diameter as the bearing.

Lubricate the new needle bearing with fresh final drive oil.

Install a new snap ring into the groove with snap ring pliers.

Cover Ring Gear Bearing

Inspect the final drive gear cover bearing and seal.

Remove the oil seal with a seal pick if needed.

Drive the final drive gear cover bearing out from the outside of the final drive gear cover.

Drive the new bearing into the final drive gear cover with a suitable driver that is the same outside diameter as the bear. The markings on the bearing must face out.

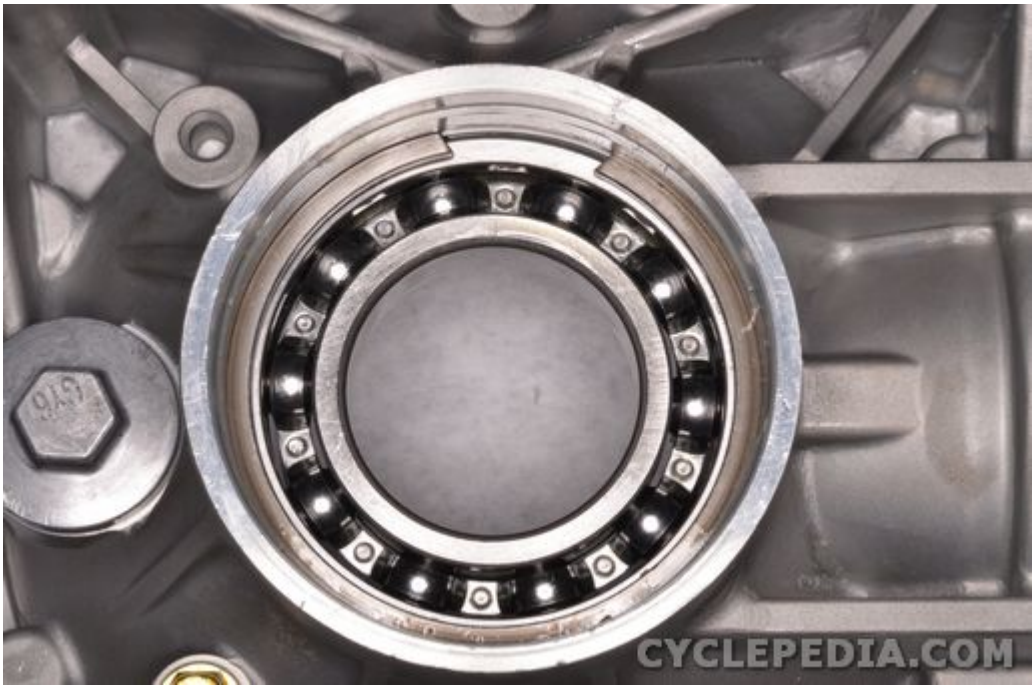
Special Tool - Bearing Driver: A120E00014

Apply waterproof grease to the lips of the new seal. Press in the seal with a suitable driver that has the same outside diameter as the seal.

Final Gear Case Ring Gear Bearing

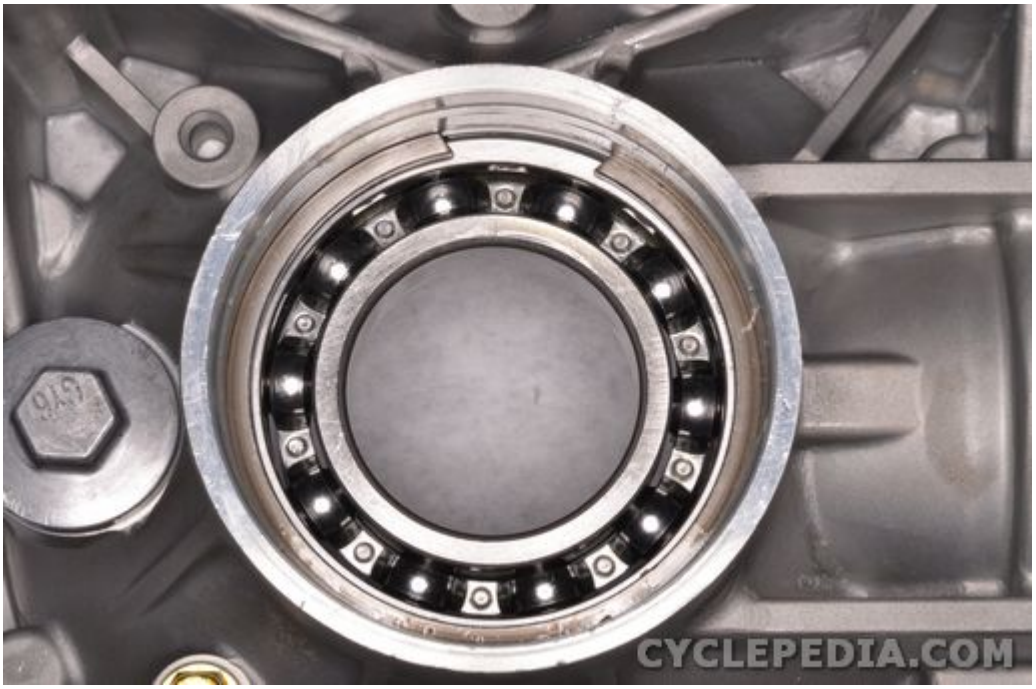
Inspect the final drive gear case bearing and seal.

Remove the oil seal with a seal pick if needed.



Remove the circlip with snap ring pliers.

Drive the drive gear case bearing out from the inside.



Drive the new bearing into the final drive gear cover with a suitable driver that is the same outside diameter as the bearing. The markings on the bearing must face out. Install a new snap ring into the groove with snap ring pliers.

Apply waterproof grease to the lips of the new seal. Press in the seal with a suitable driver that has the same outside diameter as the seal.

To assemble the final drive gear case see the Final Drive Gear Assembly topic.

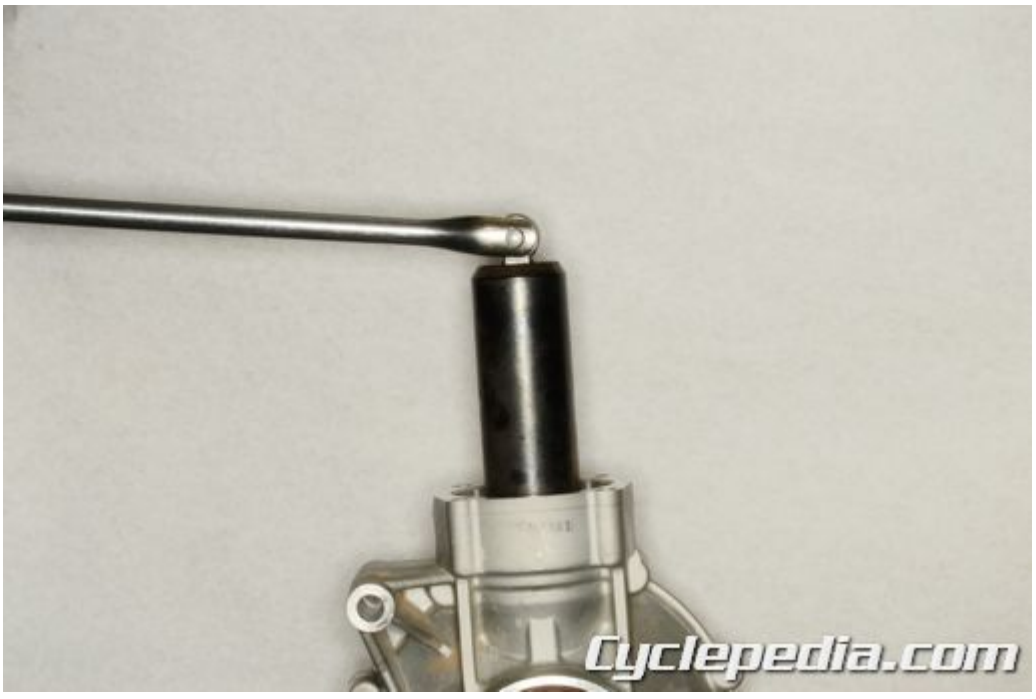
Final Drive Gear Assembly

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Pinion Gear Shaft

Install the pinion shaft assembly into the final gear case. Tap it in with a rubber mallet to seat the bearing. Place the shaft and bearing assembly in a freezer for around a half hour and gently heat the case for easy installation.

Apply a non-permanent thread locking agent (Blue Loctite) to the threads of the pinion gear shaft locknut. Do not contaminate the bearing with the locking agent. Thread the locknut into the gear case.



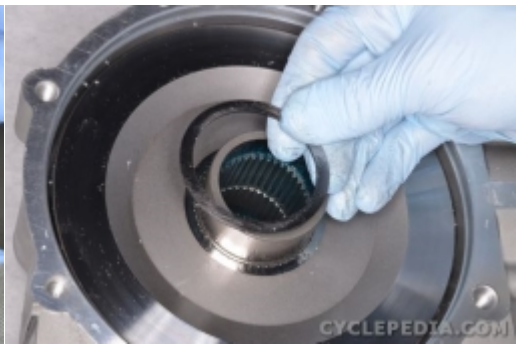
Secure the case in a soft jawed vise and torque the locknut to specification with the special wrench.

Special Tool - Pinion Gear Shaft Puller: A120F00020

Item	Torque Kgf-m (N-m, lbf-ft)
Rear drive gear case nut	5.5 (55, 40)

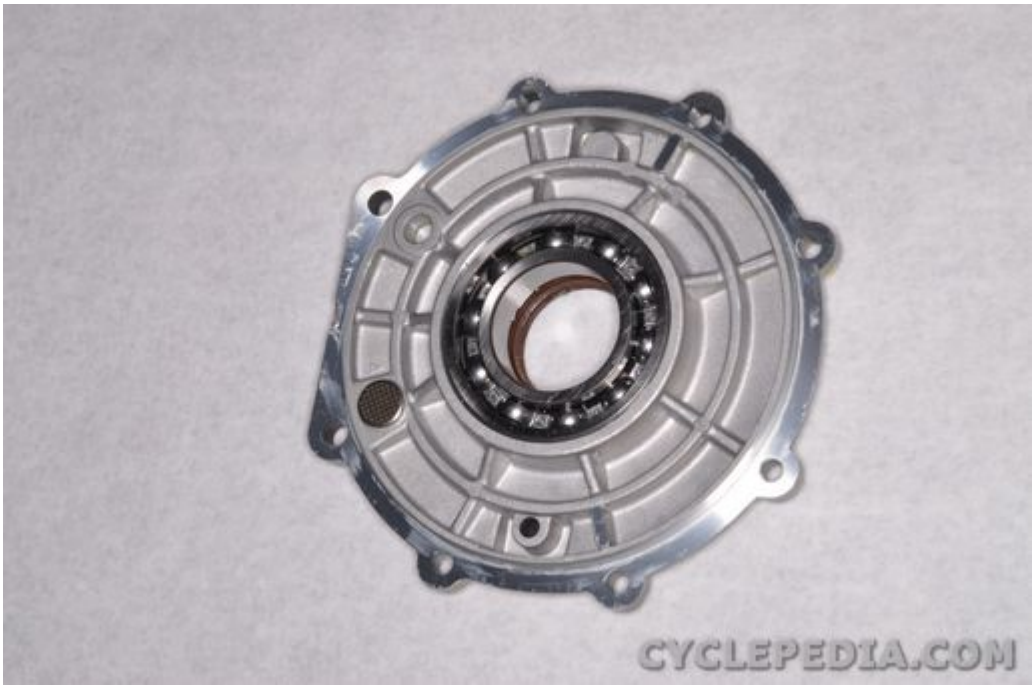
Apply waterproof grease to the lips of the new pinion gear shaft oil seal. Press in a new pinion gear shaft oil seal. Use a suitable driver that is the same outside diameter as the seal.

Ring Gear



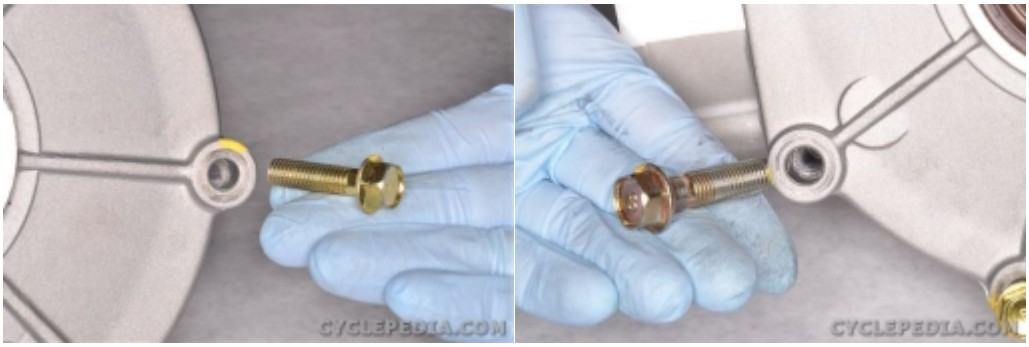
Install the ring gear with the correct shims to each side.

Final Gear Case Cover

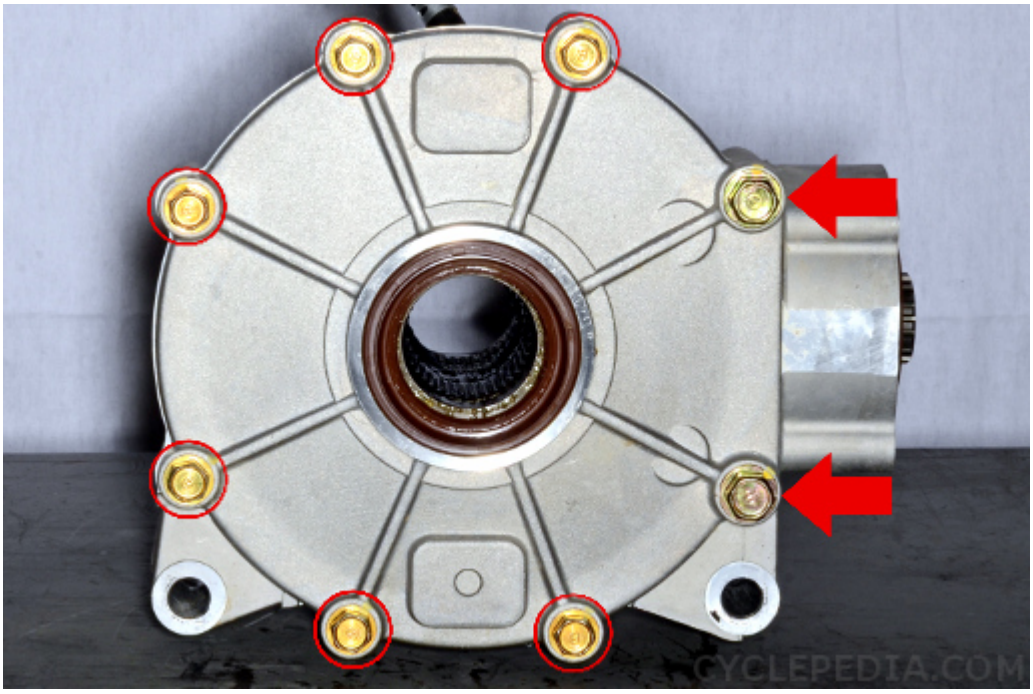


Apply a silicone sealant to the mating surface of the final gear case cover. Do not allow the sealant to contaminate the bearings or gears.

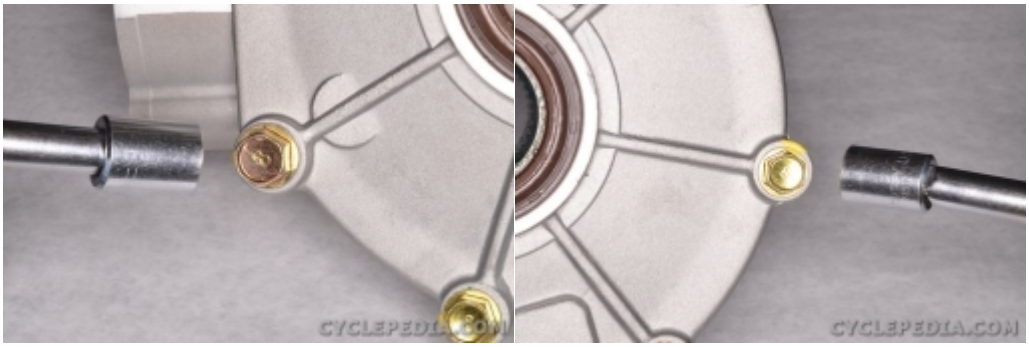
Fit the final gear case cover into place.



Apply a light coat of Threebond 1215 or other equivalent sealant to the threads of the cover bolts.



Install the eight rear final drive cover bolts. There are two large bolts (arrows) and six small bolts (circles).



Tighten the bolts to specification evenly. Use a 12 mm socket for the smaller bolts and a 14 mm socket for the two larger bolts.

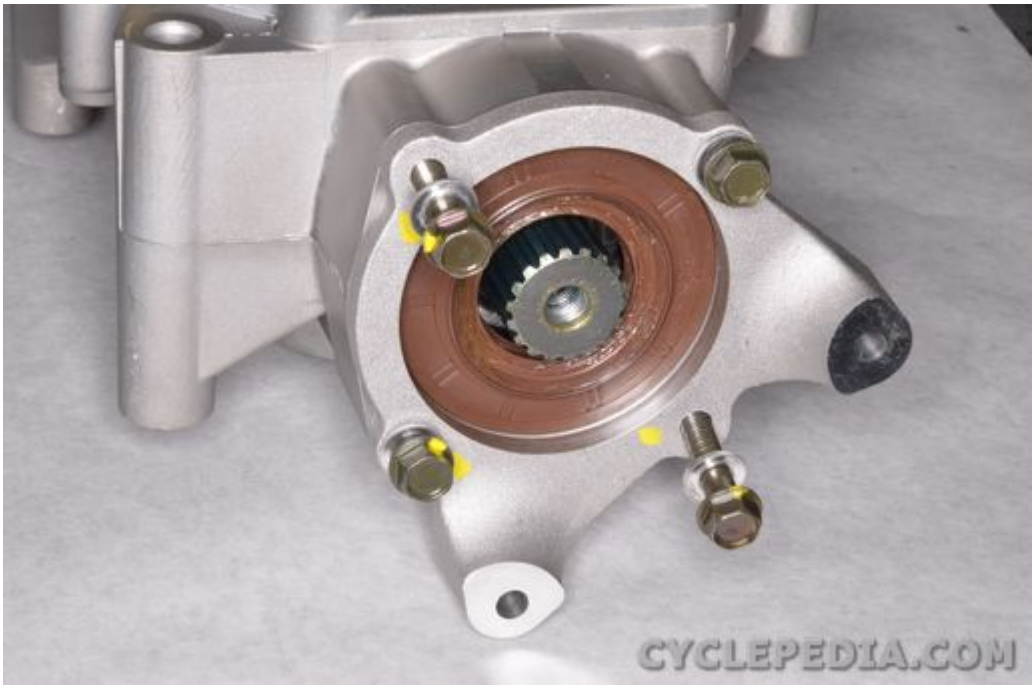
ITEM	N-m	kgf-m	ft-lb
Rear final gear case bolt (M10)	49	4.9	36
Rear final gear case bolt (M8)	25	2.5	19

Install the breather vent tube to the rear final drive gear case and secure it with the clamp.

Rear Brake Disc and Holder

Install the two rear brake caliper holder dowel pins.

Install the rear brake caliper holder.



Install the four rear brake caliper holder bolts to their original positions with washers.

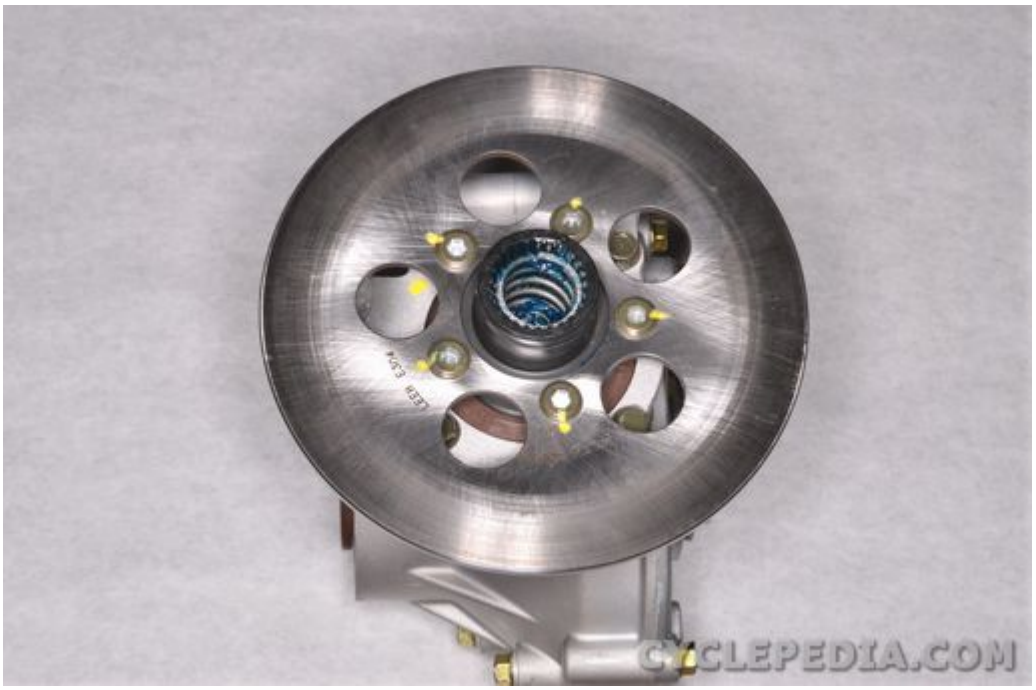
Tighten the rear brake caliper holder bolts securely with a 12 mm socket.

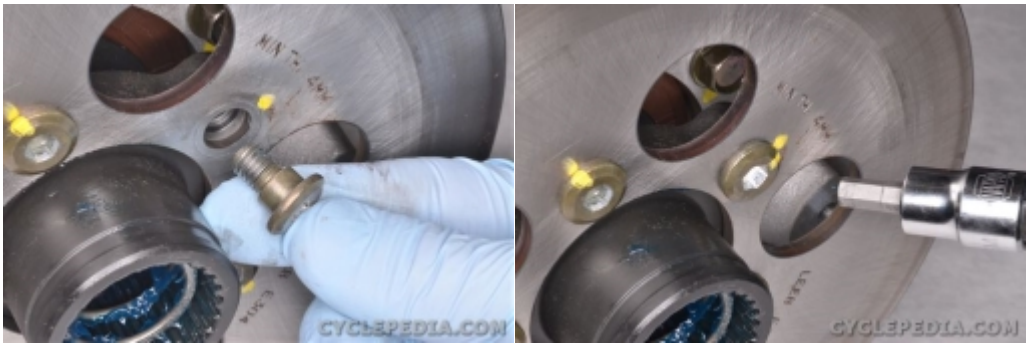
Insert the rear brake disc holder into place on the pinion gear shaft.

Apply a non-permanent thread locking agent (Blue Loctite) to the threads of the rear brake disc holder bolt. Tighten the rear brake disc holder bolt to specification with a 14 mm socket.

Coat the splines inside the rear brake disc holder with waterproof grease. Insert the spring into the rear brake disc holder.

Fit the rear brake disc into place. Do not contaminate it with oil or grease.





Install the five rear brake disc mounting bolts and tighten them to specification with a 6 mm Allen socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear brake disc and rear hub	8	3.5 (35, 25)

Install the rear final drive gear case. See the Rear Final Drive Gear topic for more information.

9.Brake System

This chapter covers the location and servicing of the front brake components for the KYMCO MXU 700i and MXU 500i models.

1.Brake Discs 9-3
2.Brake Pedal 9-10
3.Front Brake Calipers 9-30
4.Rear Brake Calipers 9-43
5.Master Cylinders 9-67

TROUBLESHOOTING

Loose brake lever

- Air in hydraulic brake system
- Brake fluid level too low
- Hydraulic brake system leakage

Tight brake lever

- Seized piston
- Clogged hydraulic brake system
- Smooth or worn brake pad

Poor brake performance

- Air in brake system
- Deteriorated brake fluid
- Contaminated brake pads and brake disk
- Worn brake pads
- Worn brake master cylinder piston oil seal
- Clogged brake fluid line
- Deformed brake disk
- Unevenly worn brake pad

Brake noise

- Contaminated brake pad surface
- Excessive brake disk run out
- Incorrectly installed caliper
- Brake disk or wheel not aligned

Hard braking

- Seized hydraulic brake system
- Seized piston

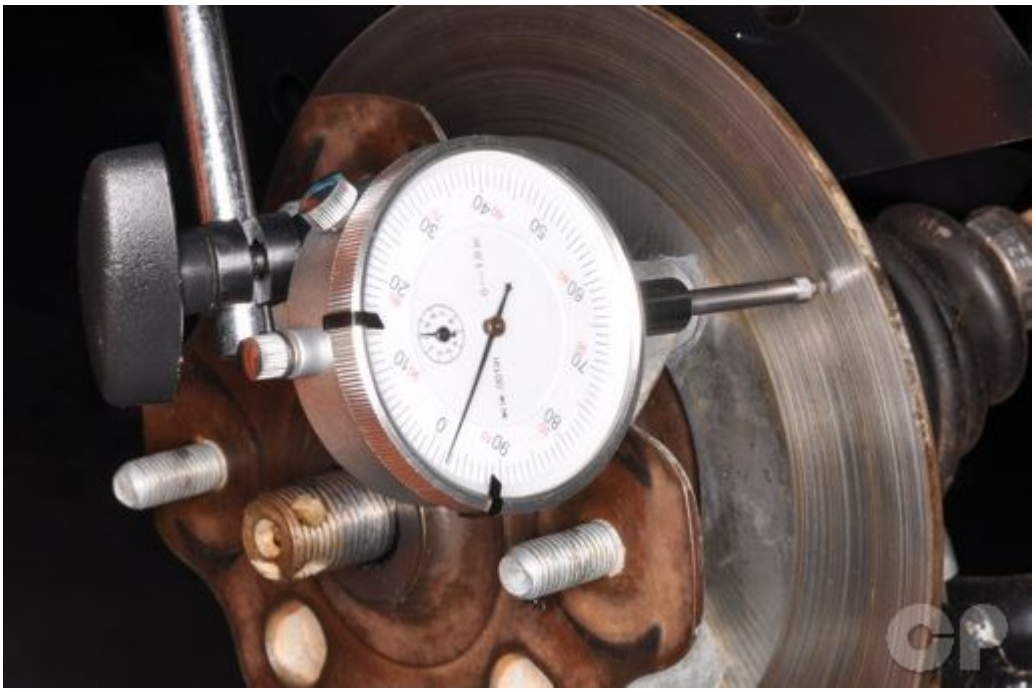
Brake Discs

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

Remove the wheels. See the Wheels and Wheel Hubs topic for more information.

Check the brake discs for damage or excessive wear.



Using a dial gauge and stand measure the disc brake runout. Replace the front discs as a set if any are out of the service limit.

Item	Service Limit
Brake disc runout	0.30 mm (0.012 in)

Measure the brake disc thickness with a micrometer. Replace the rotor if it is below the service limit.

Item	Standard mm (in)	Service Limit
Brake disk thickness	FR: 4.0 (0.156) RR: 5.0 (0.195)	FR: 3 (0.12) RR: 4 (0.156)

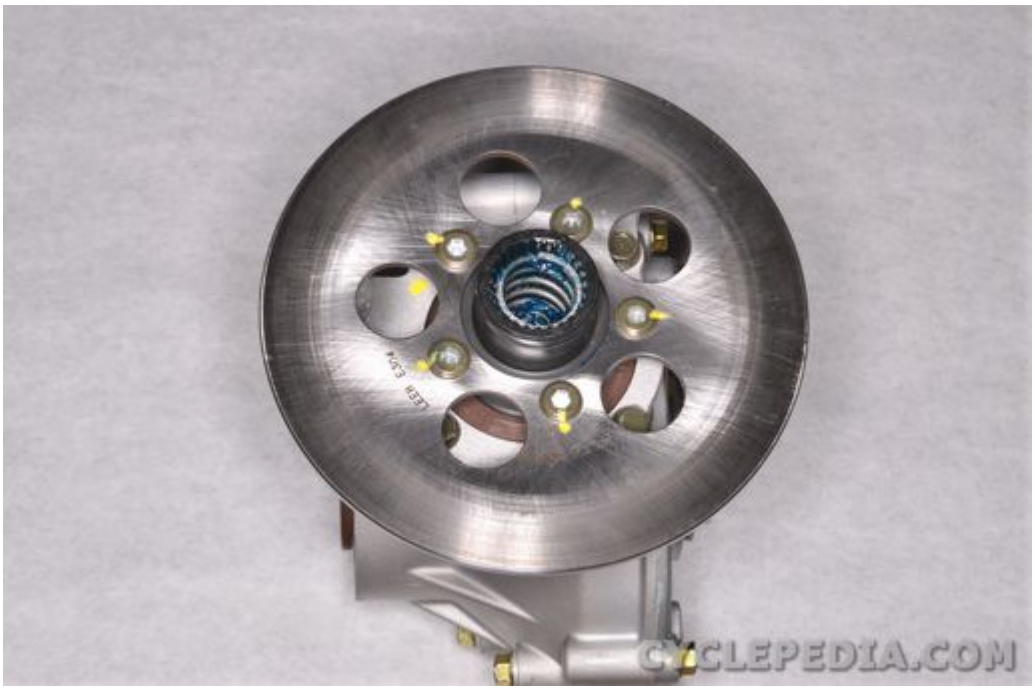
Removal

Front

To remove the brake disc take out the four disc brake bolts with a Torx socket wrench. Separate the disc brake from the wheel hub.

Rear

Remove the rear final drive. See the Rear Final Drive Gear topic for more information.



Remove the five rear brake disc bolts with a 6 mm Allen socket.

Remove the rear brake disc from the brake disc holder.

Installation

Front

Install the disc brake onto the wheel hub. Tighten the four bolts to specification with a Torx socket.

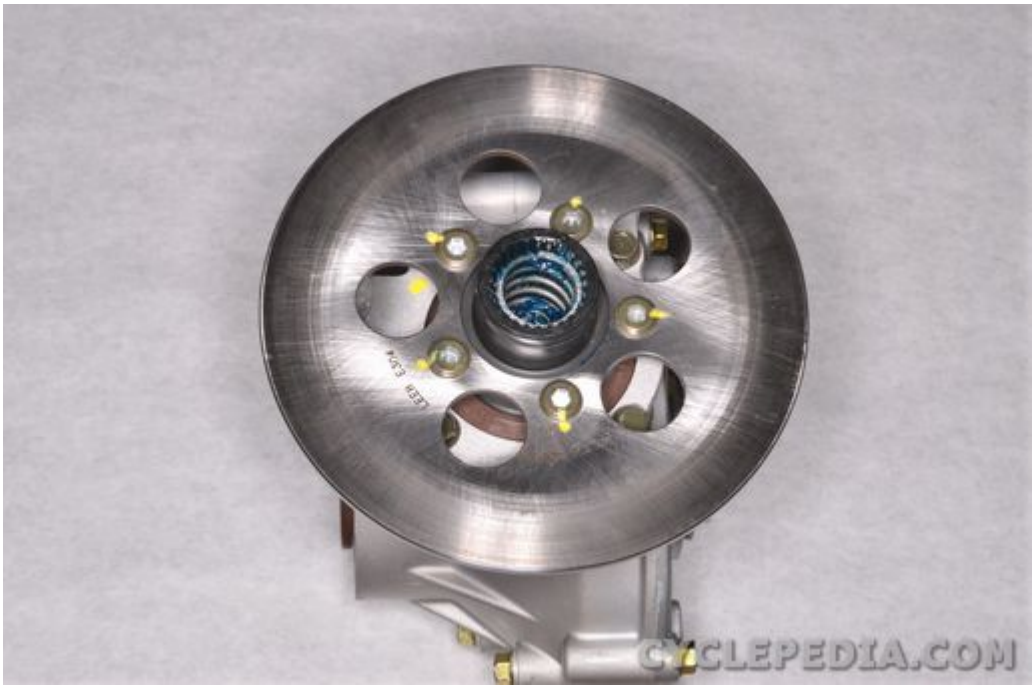
Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Front brake disc and front hub	6	2.0 (20, 14)

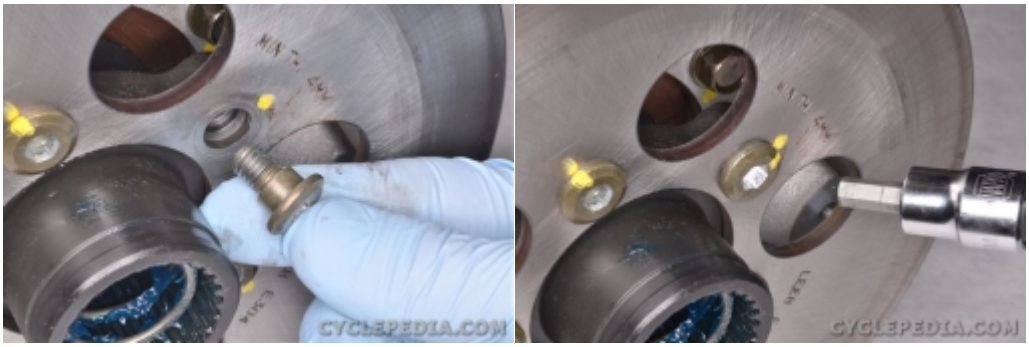
Install the front wheels. See the Wheels and Wheel Hubs topic for more information.

Check the function of the brakes before riding.

Rear

Fit the rear brake disc into place. Do not contaminate it with oil or grease.





Install the five rear brake disc mounting bolts and tighten them to specification with a 6 mm Allen socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear brake disc and rear hub	8	3.5 (35, 25)

Install the rear final drive gear case. See the Rear Final Drive Gear topic for more information.

Brake Pedal and Master Cylinder

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

NOTE: Brake fluid is a corrosive chemical and can damage paints and some plastics. Avoid contact with skin.

There are two rear brake calipers. The caliper that mounts to the top of the final drive gear is connected to the pedal activated master cylinder. The caliper that mounts to the side of the final drive gear is connected to the left handlebar master cylinder.

Removal

Remove the right mudguard. See the Mudguards and Footrests topic for more information.

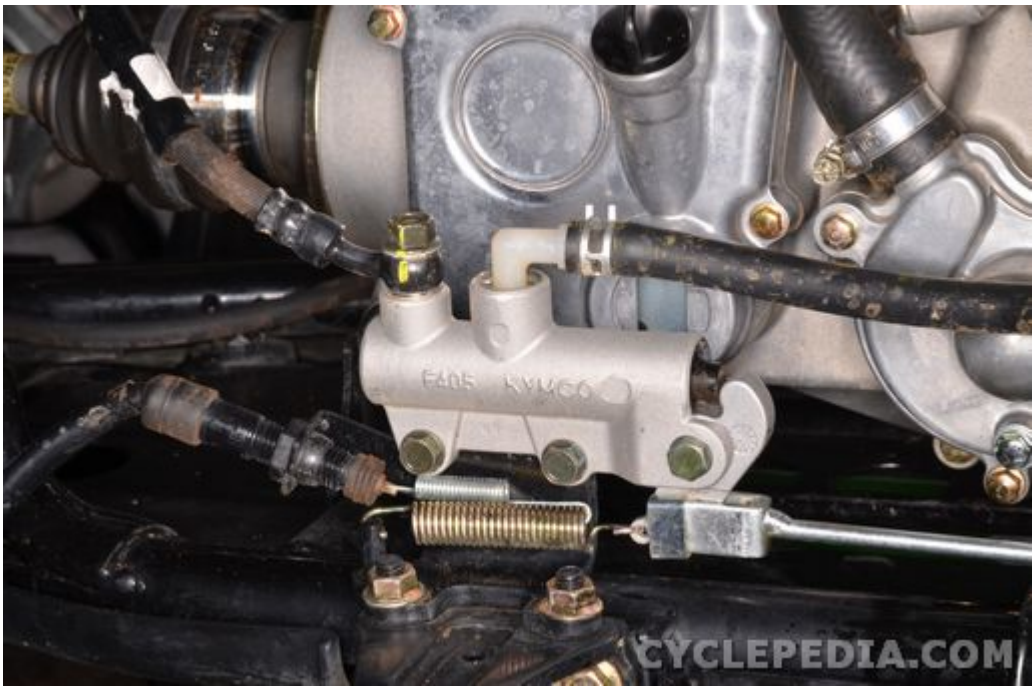
The brake pedal is mounted to a pivot on the right side of the frame.

Trace the wire up from the rear brake light switch and unplug the connector.

Drain the brake fluid from the brake pedal master cylinder system if the master cylinder is to be disconnected from the brake hose. See the Brake Fluid topic for more information.

Remove the master cylinder reservoir mounting bolt with a #3 Phillips screwdriver.

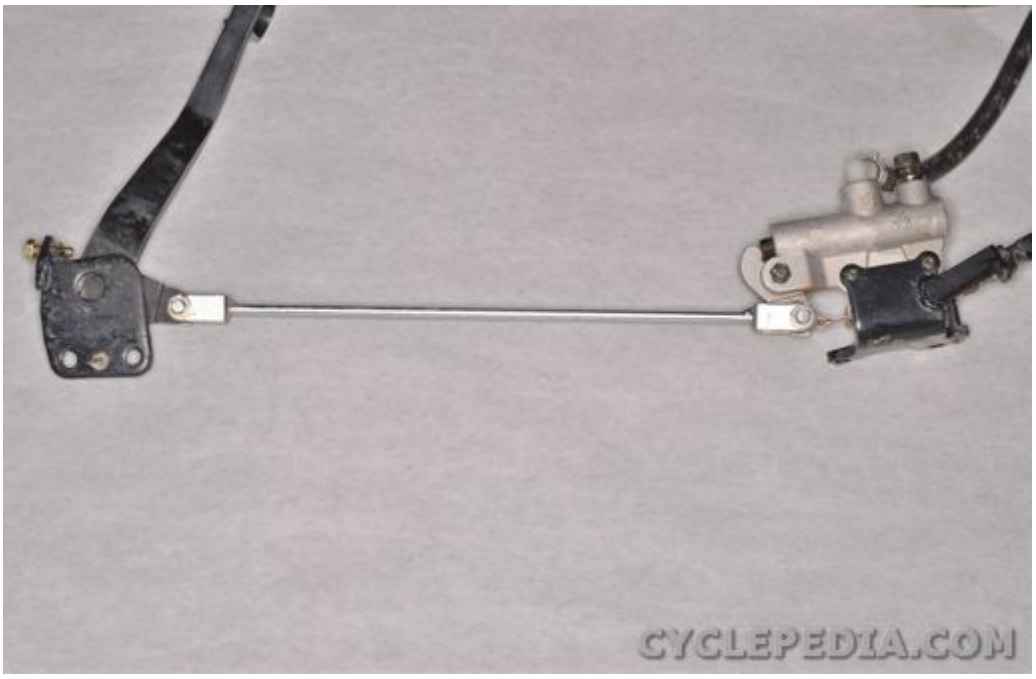
Remove the two brake pedal pivot mounting bolts.

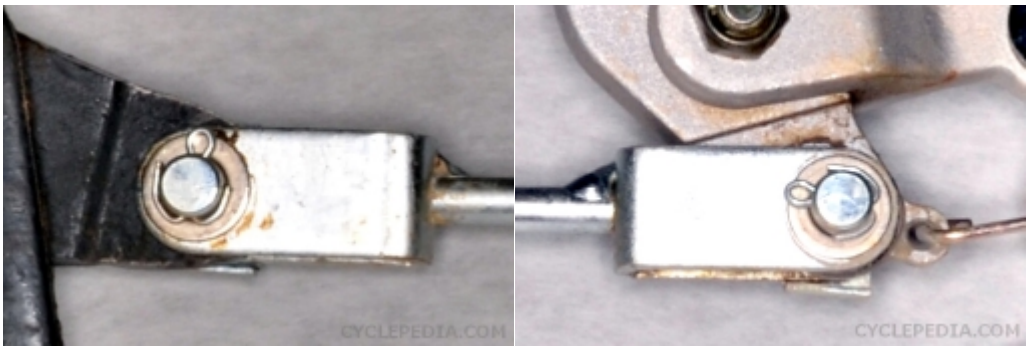


Loosen the brake hose banjo bolt with a 12 mm socket. Remove the banjo bolt and the two sealing washers. Remove the two master cylinder mounting bracket nuts with a 12 mm socket.

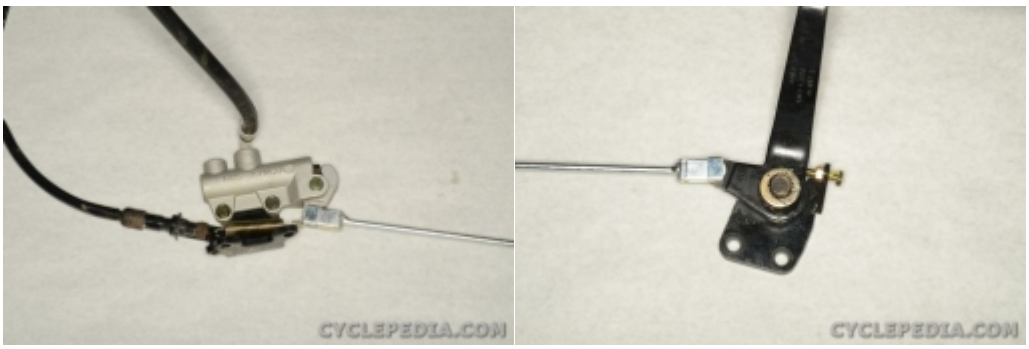
Remove the pedal and master cylinder assembly from the frame.

Disassembly





Remove the two cotter pins, washers, and joints to remove the brake rod.



Remove the master cylinder rod cotter pin, washer, and pivot pin. Separate the master cylinder rod from the brake pedal.

To remove the pedal from the bracket take out the cotter pin and remove the washer. Slide the pedal off of its pivot.

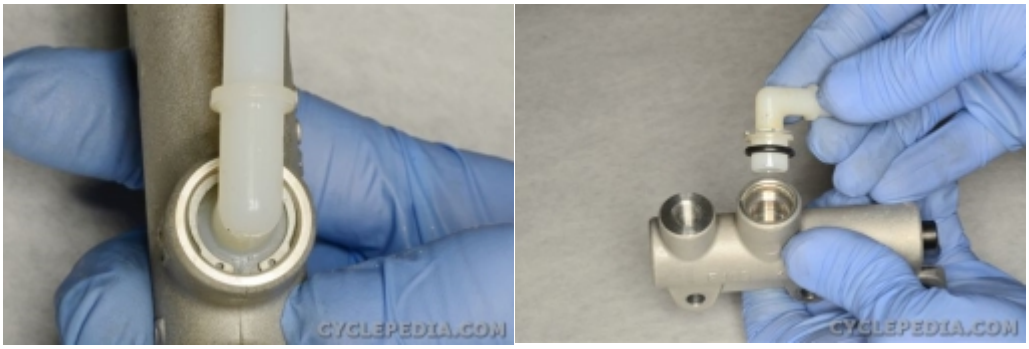
To remove the reservoir hose slide up the clamp and free the hose form the master cylinder. To free the master cylinder from the bracket remove the two mounting bolts with a 10 mm socket.

Use a spring puller to remove the pedal return spring and rear brake light switch spring.

To remove the master cylinder lever hold the bolt and loosen the nut. Remove the nut and bolt.

Remove the lever from the master cylinder.

Take care to keep track of the washers that sit on each side of the lever.

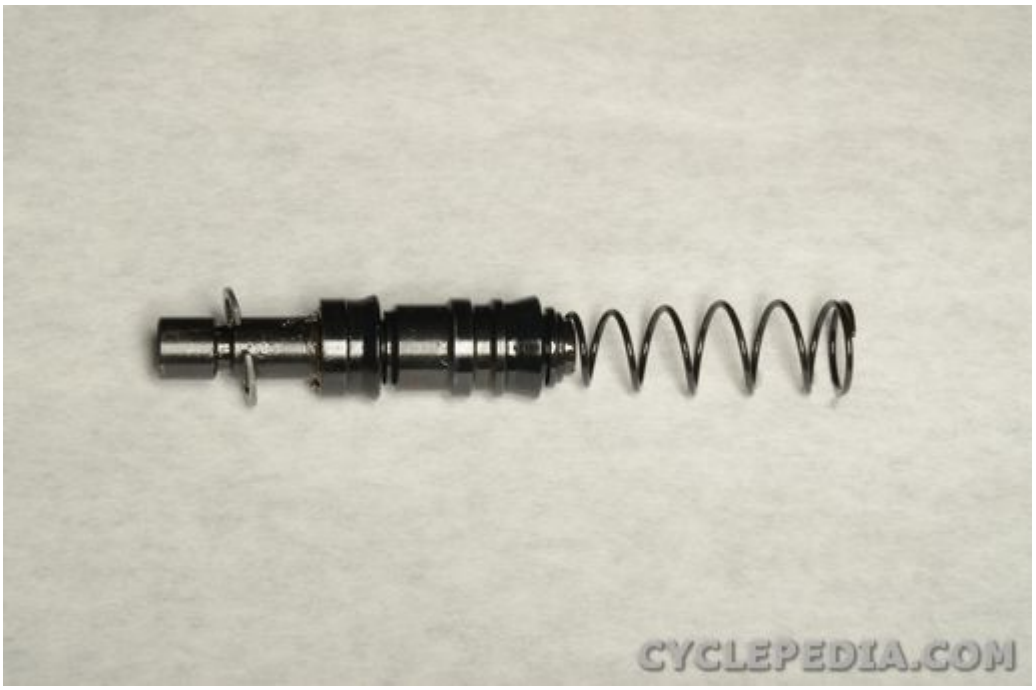


Remove the reservoir pipe snap ring with snap ring pliers. Lift out the reservoir pipe. Inspect the O-ring and replace it as needed.

Remove the rubber cover from the master cylinder piston.

Remove the snap ring using a pair of internal snap ring pliers. Use a suitable tool to hold back the piston as it can spring out.

Remove the piston and spring from the master cylinder.



Inspect the piston, seals, and master cylinder bore for wear and damage. Replace the master cylinder an assembly if the components are damaged.

Assembly

Clean the master cylinder components with fresh brake fluid (DOT-4).

Lubricate the piston and seals with fresh brake fluid. Insert the spring and piston into the master cylinder.

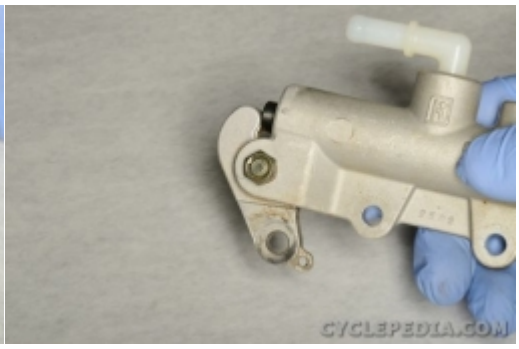
Push in the piston and install the snap ring into its groove with snap ring pliers.

Install the rubber cover over the piston.

Install the reservoir pipe with an O-ring in good condition. Install the snap ring into its groove with snap ring pliers.

Place washers on each side of the master cylinder lever.

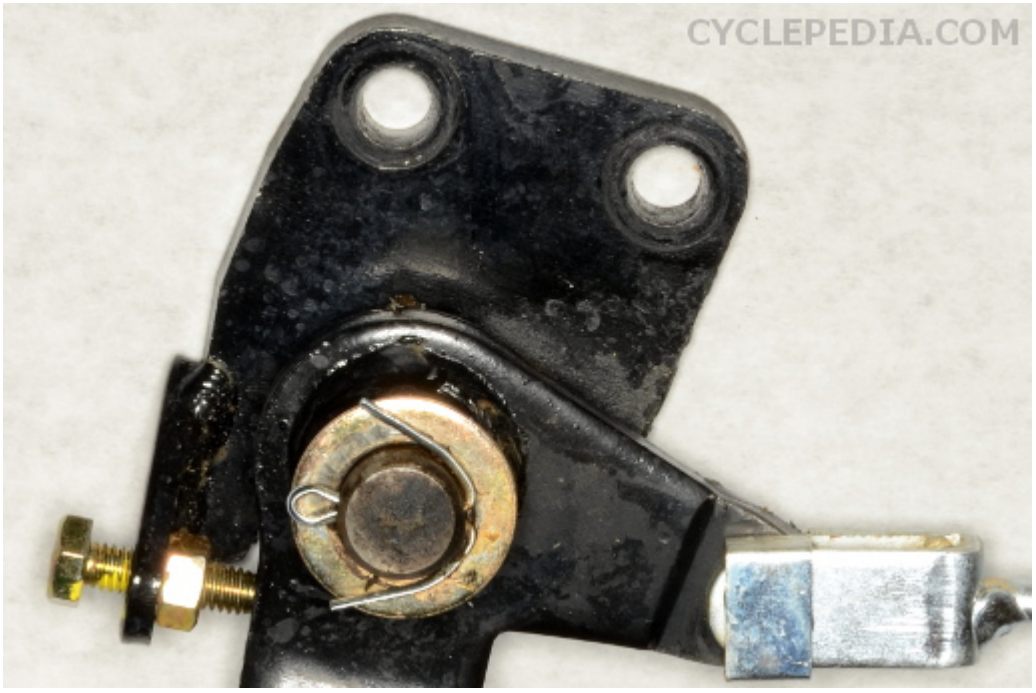
Install the lever into the master cylinder as shown.



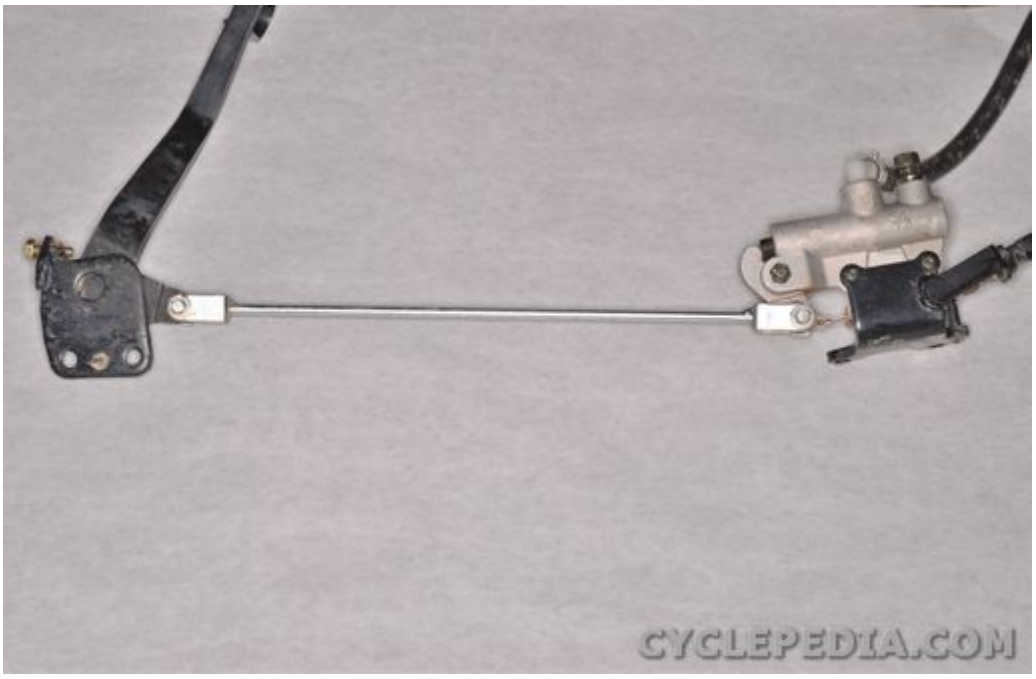
Apply a light coat of waterproof grease to the pivot bolt. Install the pivot bolt and nut and tighten them securely.

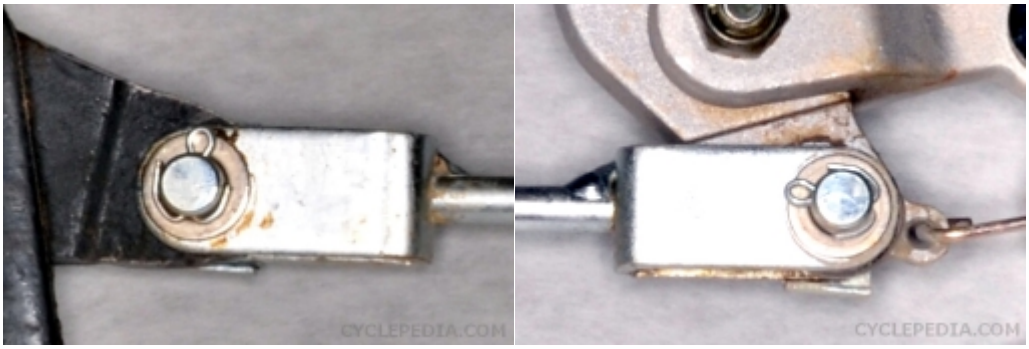
Install the bracket to the master cylinder and tighten the two bolts securely.
Use a spring puller to install the pedal return spring and rear brake light switch spring as shown.

Connect the reservoir hose to the pipe and secure it with the clamp.



Apply a light coat of waterproof grease to the pedal pivot. Fit the pedal onto the pivot. Install the washer and a new cotter pin. Bend the pin as shown to secure the pedal and washer.

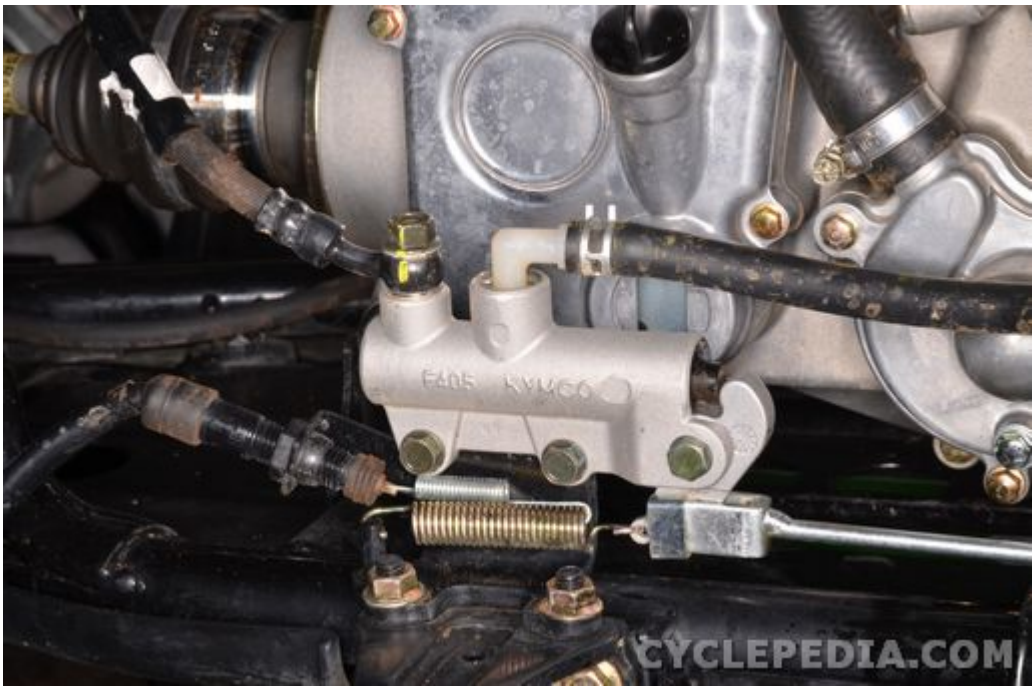




Connect the brake rod to the pedal and lever. Install the joints, washers, and new cotter pins. Bend the cotter pins to secure the rod.

Installation

Fit the master cylinder and pedal into place on the right side of the frame.



Install the two master cylinder mounting bracket nuts with a 12 mm socket and tighten them securely. Connect the brake hose to the master cylinder. Use a new sealing washer to each side of the banjo bolt. Tighten the brake hose banjo bolt to specification with a 12 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Brake hose oil bolt	10	3.5 (35, 25)

Install the two brake pedal pivot mounting bolts and tighten them securely.

Fir the reservoir into place and install the mounting bolt. Tighten the bolt securely with a #3 Phillips screwdriver.

Plug in the rear brake light switch connector.

Fill the rear brake system with brake fluid and bleed out the air. See the Brake Fluid topic for more information.

Adjust the rear brake pedal and brake light switch. See the Brake Fluid topic for more information.

Install the right mudguard. See the Mudguards and Footrests topic for more information.

Front Brake Calipers

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Brake fluid is very caustic and can damage paint, chrome and plastic. Wipe up any spills immediately.

There are three brake calipers, two for the front, and one with the left rear wheel hub.

Removal

Remove the front wheels or left rear wheel as needed. See the Wheels and Wheel Hubs topic for more information.

Drain the brake fluid if the caliper is to be completely removed and disassembled. See the Brake Fluid topic for more information.

Note: If you are only replacing the brake pads it is not necessary to drain the brake fluid.

Remove the two brake caliper mounting bolts.

Remove the brake caliper from the knuckle and disc.

Note: Do not use the front brake while the caliper and brake pads are not installed on the vehicle.

Brake Pad Replacement

Push the pads and bracket in towards the caliper piston. Remove the brake pads.

Discard the brake pads if the linings are below 1 mm or 0.039 in thick.

Install the brake pads. See the Installation section for more information.

Disassembly

Loosen the brake hose banjo bolt with a 12 mm socket. Remove the banjo bolt and sealing washers. Place the end of the brake hose in a suitable container to container to collect any dripping brake fluid.

Remove the caliper bracket. Inspect the caliper bracket O-rings and replace them as needed.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

Remove the pin boots from the caliper.

Place a thick rag over caliper piston and use compressed air to move the piston out. Do not place your fingers over the caliper piston while removing it as serious injury could result.

Remove the caliper piston by hand.

Remove the dust seal from the caliper bore and discard.

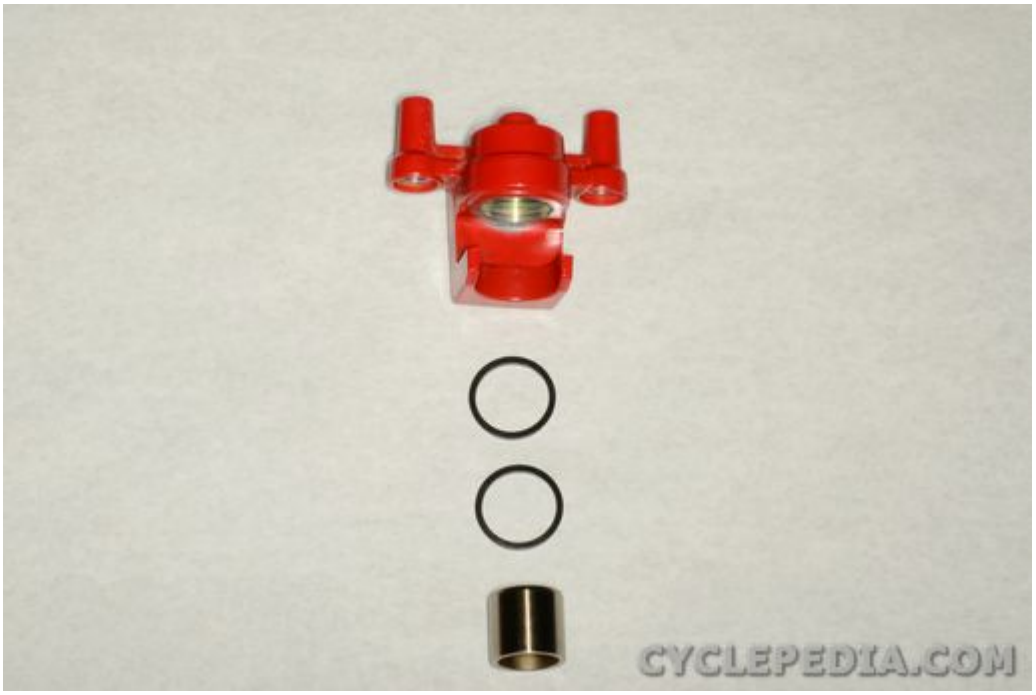
Use a mechanics pick to remove the piston fluid seal from the caliper bore and discard.

Inspection

Check the brake caliper bore for any scratches, damage or excessive wear. Clean the brake caliper bore with DOT 4 brake fluid. Do not dry off with a rag.

Check the piston for any scratches, damage or excessive wear. Clean the piston with DOT 4 brake fluid. Do not dry off with a rag.

Assembly



Coat the new seals, piston, and piston bore with DOT 4 brake fluid.

Install a new piston fluid seal into the inner groove. Install a new dust seal into the outer groove in the caliper bore. Install the piston into the caliper bore closed end first. Push the piston all the way in.

Install the pin boots into the caliper.

Apply silicone grease to the caliper bracket pins. Install the caliper bracket.

Installation

Install the brake pads.

Fit the brake caliper into place. Guide the brake disc between the pads.

Install the two brake caliper mounting bolts and tighten them to specification.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
CALIPER AND FR/RR KNUCKLE	M8 X 1.25	2 4-3.2	24-32	20

Connect the brake hose to the caliper if it was removed. Use a new sealing washer on each side of the hose fitting. Tighten the banjo bolt to specification.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
FRONT/REAR CALIPER AND BRAKE HOSE END	M10 X 1.25	2.4-3.2	24-32	20

Install the wheels. See the Wheels and Wheel Hubs topic for more information.

Fill the master cylinder reservoir with brake fluid and bleed the brakes. See the Brake Fluid topic for more information.

Make sure the brakes work properly before riding.

Burnishing New Brake Pads

Warning: Failure to properly burnish the brake pads could lead to premature brake pad wear or brake loss. Brake loss can result in severe injury.

Brake pads (both main and auxiliary) must be burnished to achieve full braking effectiveness. Braking distance will be extended until brake pads are properly burnished. To properly burnish the brake pads, use the following procedure.

1. Choose an area large enough to safely accelerate the ATV to 30 mph and to brake to a stop.

2. Accelerate to 30 mph; then compress brake lever or apply the auxiliary brake to decelerate to 0-5 mph.

3. Repeat procedure on each brake system five times.

4. Adjust the auxiliary' brake (if necessary).

5. Verify that the brake light illuminates when the hand lever is compressed or the brake pedal is depressed.

Rear Brake Calipers

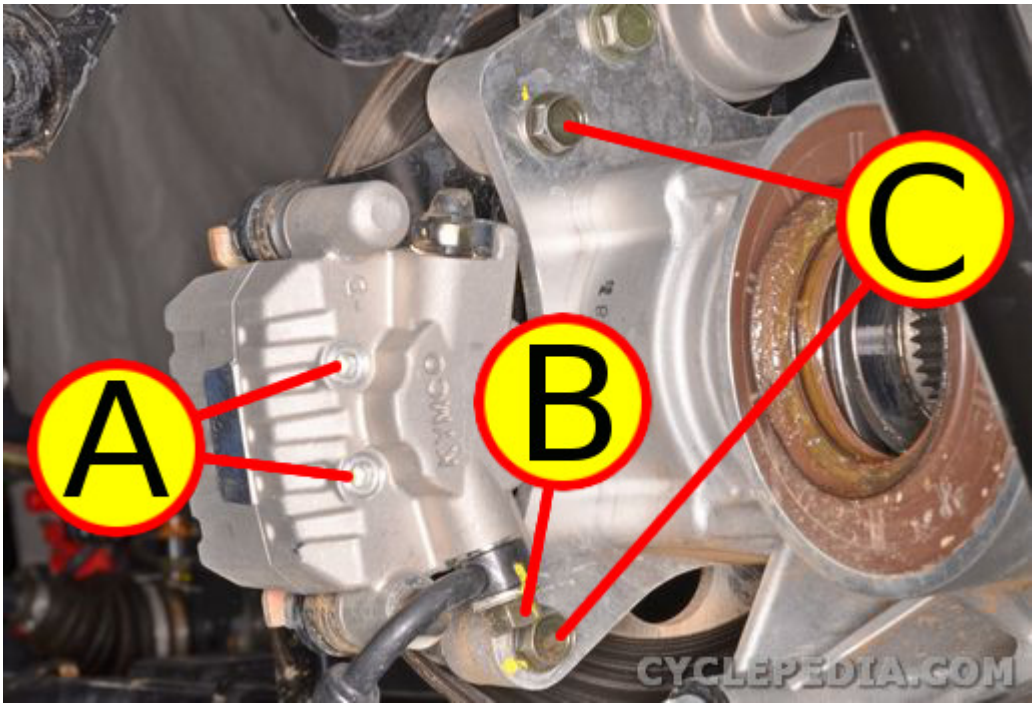
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

NOTE: Brake fluid is a corrosive chemical and can damage paints and some plastics. Avoid contact with skin.

There are two rear brake calipers. The caliper that mounts to the top of the final drive gear is connected to the pedal activated master cylinder. The caliper that mounts to the side of the final drive gear is connected to the left handlebar master cylinder.

Side Caliper

Removal



If the brake pads are going to be removed go ahead and loosen the pad pins (A) with a 5 mm Allen. If the brake caliper is to be disassembled drain the brake fluid (Brake Fluid), and remove the banjo bolt (B) with a 12 mm socket. Remove the two brake caliper mounting bolts (C) with a 12 mm socket.

Remove the side brake caliper from the final drive gear.

Brake Pad Replacement

Remove the brake pad pins with a 5 mm Allen.

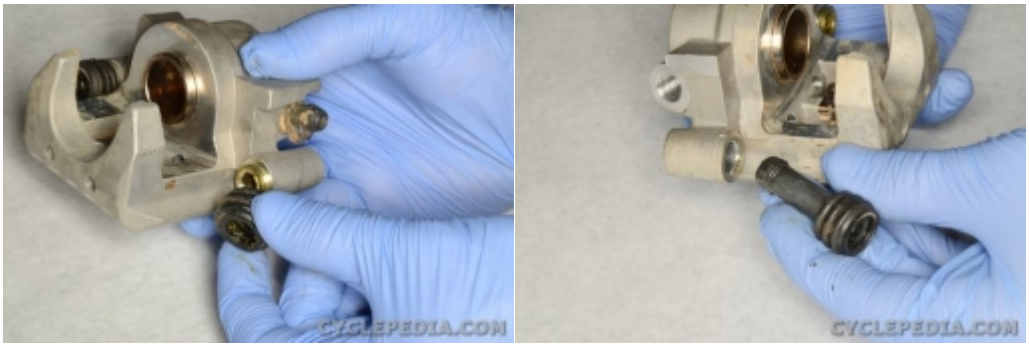
Push in the brake pads and compress the piston. Remove the brake pads.

Replace the brake pads if the wear indicators are worn away.

Disassembly

Remove the brake hose banjo bolt with a 12 mm socket. Remove the banjo bolt and sealing washers.

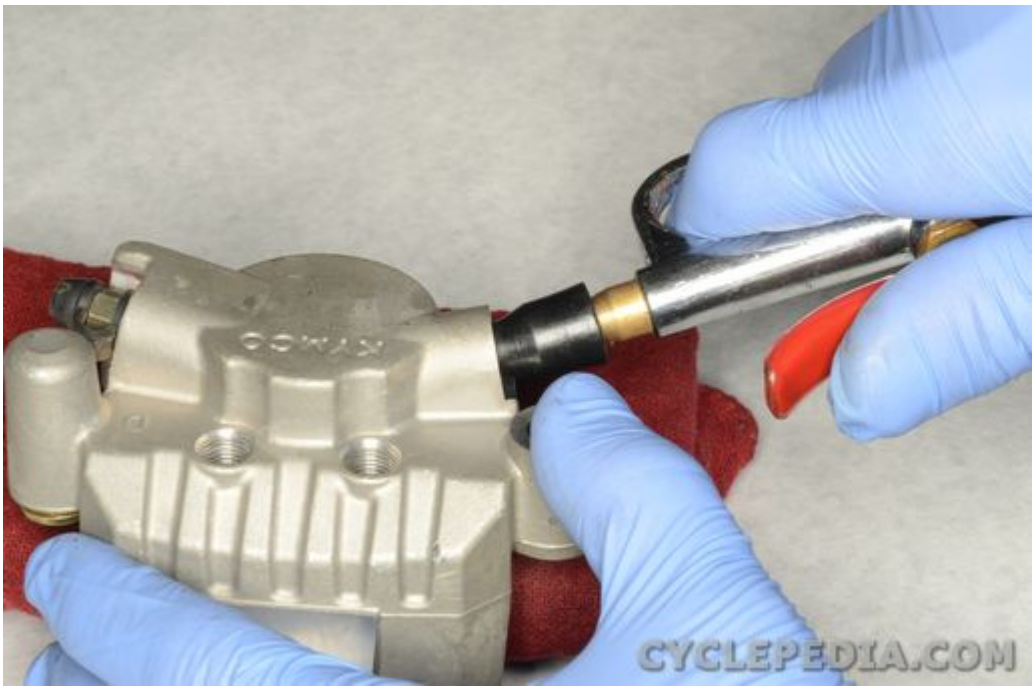
Remove the caliper bracket.



Remove the rubber boots. Replace if damaged.

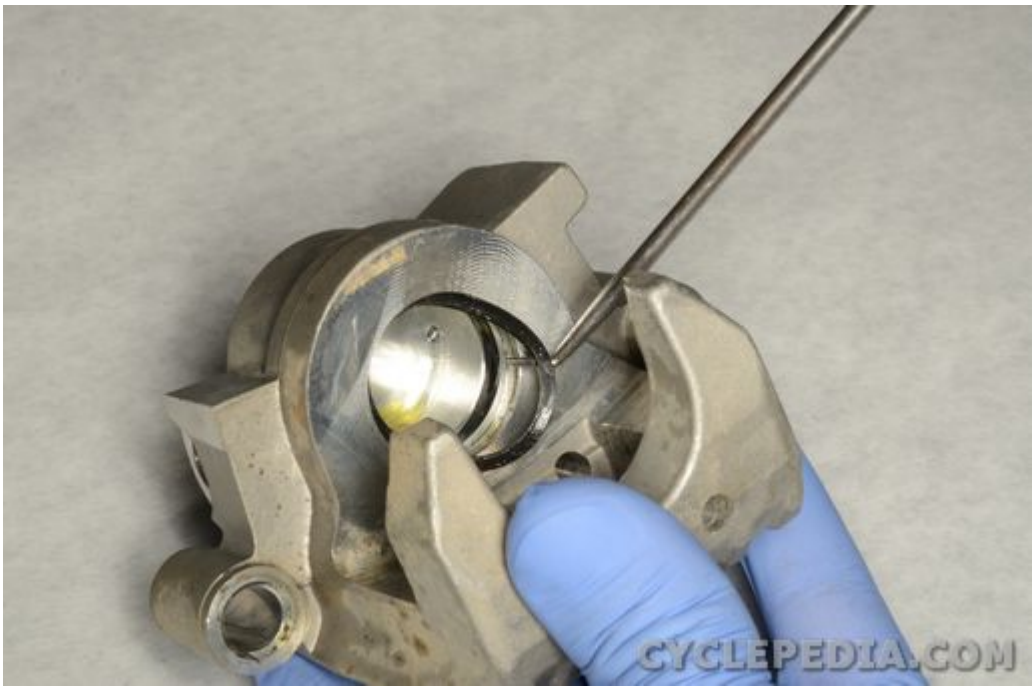
Remove the brake pad spring.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.



Place a thick rag over caliper piston and use compressed air to move the piston out. Do not place your fingers over the caliper piston while removing it as serious injury could result.

Remove the caliper piston by hand.



Remove the dust seal from the outer caliper bore and discard.

Use a mechanics pick to remove the piston seal from the inner caliper bore and discard.

Inspection

Check the brake caliper bore for any scratches, damage or excessive wear.
Clean the brake caliper bore with DOT 4 brake fluid.

Check the piston for any scratches, damage or excessive wear. Clean the piston with DOT 4 brake fluid.

Check the brake caliper holder for damage.

Assembly

Coat the new seals, piston, and piston bore with DOT 4 brake fluid.

Install a new piston seal into the inner caliper bore groove. Install the dust seal into the outer groove.

Install the piston into the caliper so that the open end faces out. Push the piston all the way in.

Install the brake pad spring.

Install the rubber boots.

Apply silicone grease to the caliper bracket pins. Install the caliper bracket.

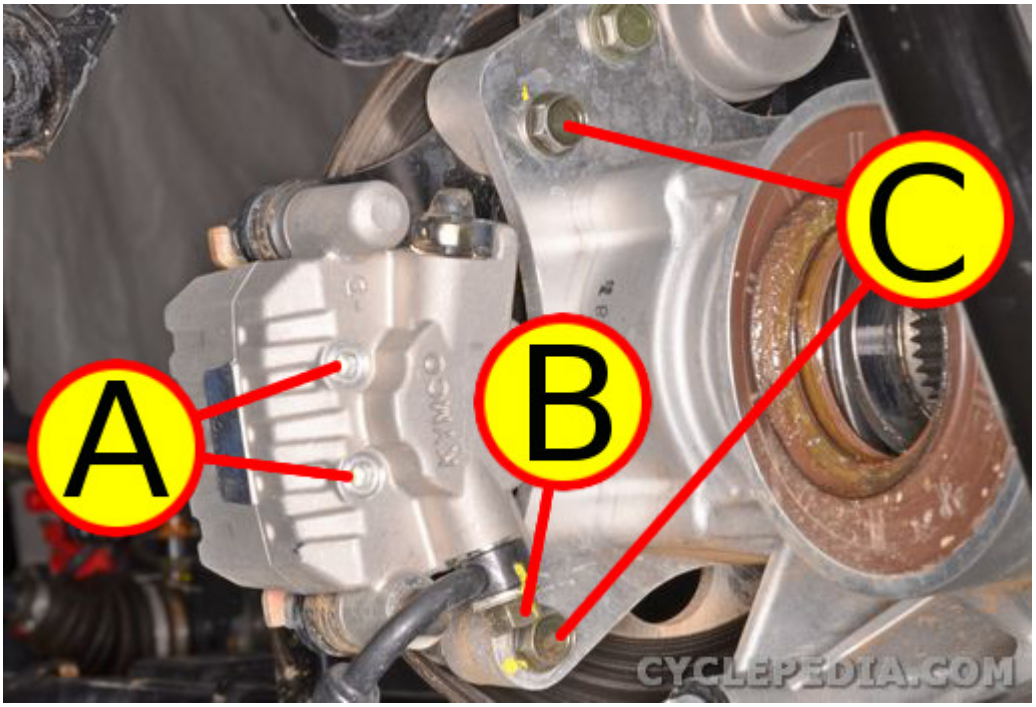
Brake Pad Installation

Install the inner brake pad and then the outer brake pad.

Install the two the brake pad mounting pins into the caliper and through the brake pads.

Installation

Fit the brake caliper into place on the final drive gear case and guide the disc between the pads.

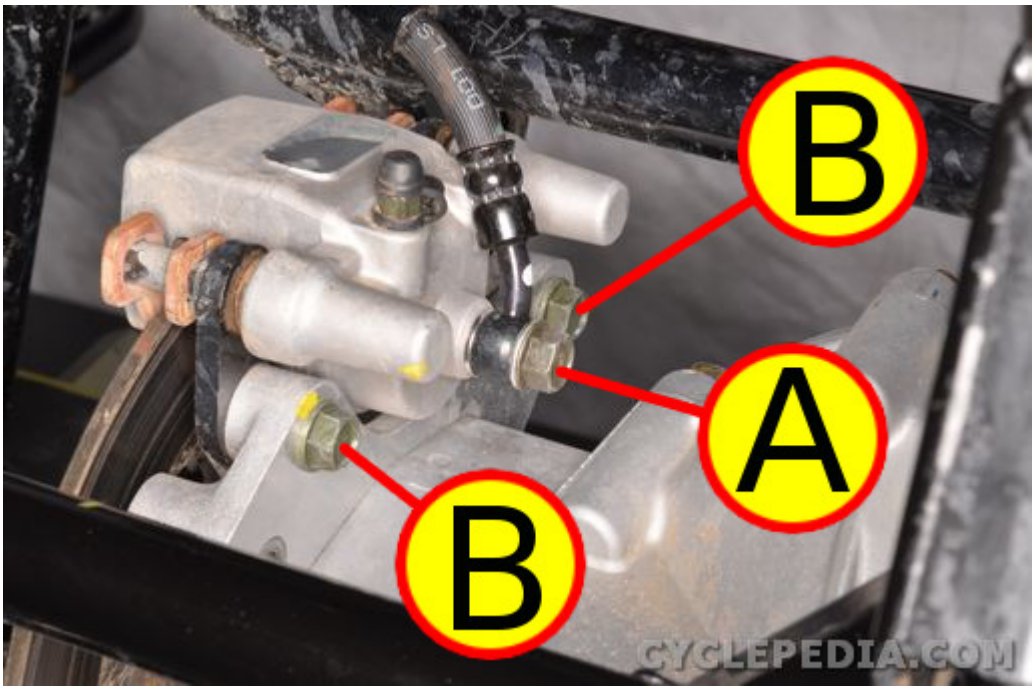


Install the two brake calipers mounting bolts (C) and tighten them to specification with a 12 mm socket. Tighten the pad pins (A) to specification with a 5 mm Allen wrench. Install new sealing washers and tighten the brake hose banjo bolt (B) to specification with a 12 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear disc holder and gear box	10	4.5 (45, 34)
Brake pad mounting pin	-	1.8 (18, 13)
Brake hose oil bolt	10	3.5 (35, 25)

Top Caliper

Removal

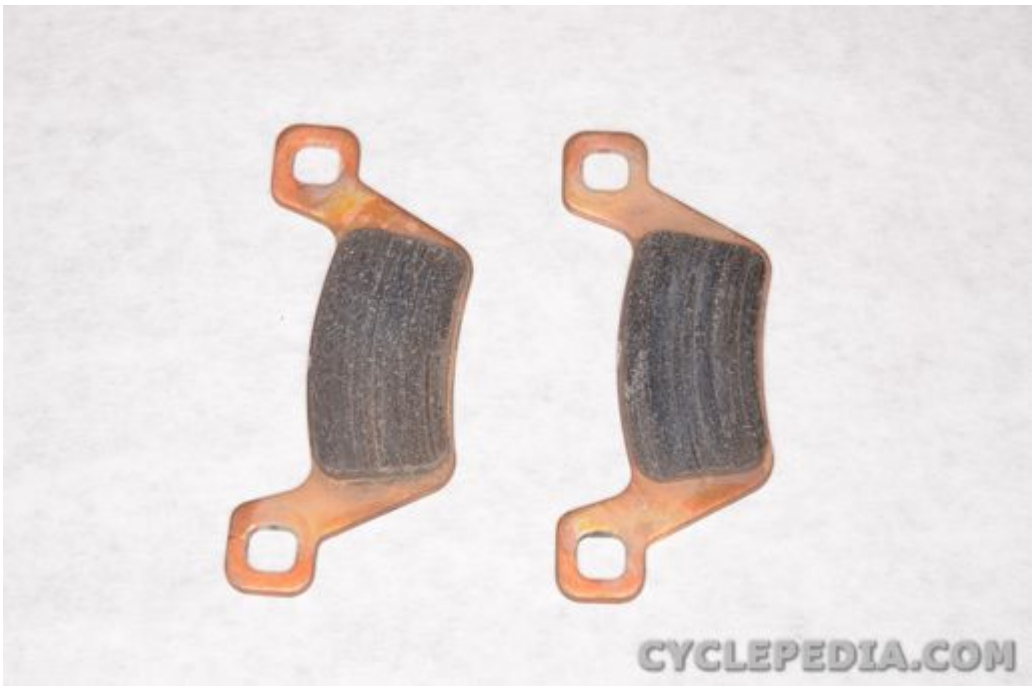


If the brake caliper is to be disassembled drain the brake fluid (Brake Fluid), and remove the banjo bolt (A) with a 12 mm socket. Remove the two brake caliper mounting bolts (B) with a 12 mm socket.

Brake Pad Replacement

Push in the brake pads and compress the piston.

Remove the brake pads.



Discard the brake pads if the linings are below 1 mm or 0.039 in thick.

Disassembly

Remove the caliper bracket. Inspect the caliper bracket O-rings and replace them as needed.

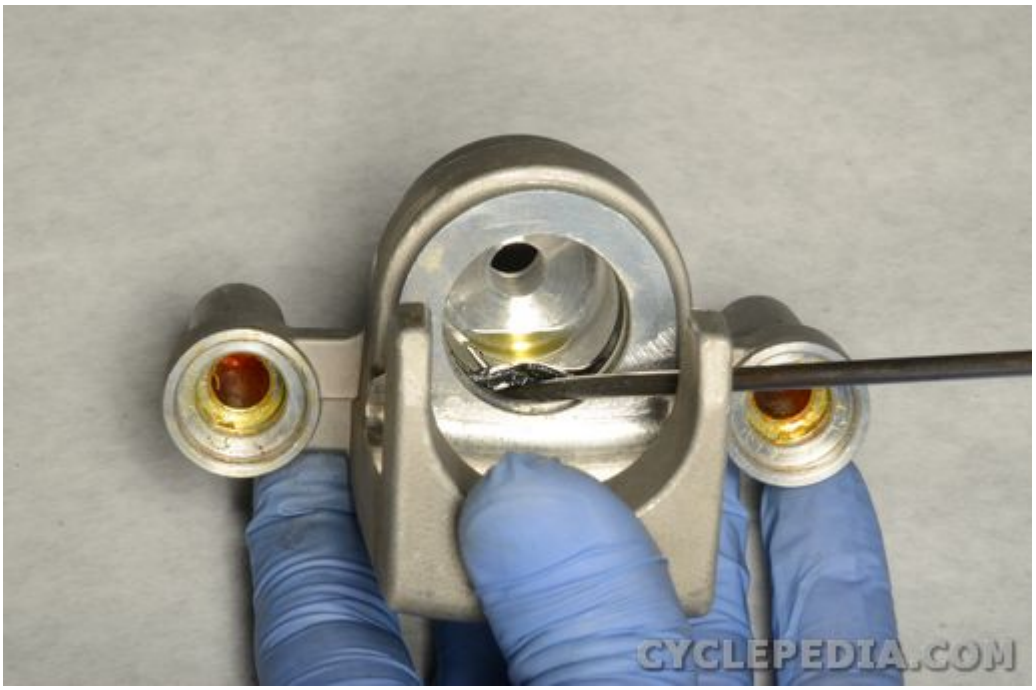
Remove the rubber boots. Replace if damaged.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

Place a thick rag over caliper piston and use compressed air to move the piston out. Do not place your fingers over the caliper piston while removing it as serious injury could result.

Remove the caliper piston by hand.

Remove the dust seal from the caliper bore and discard.



Use a mechanics pick to remove the piston fluid seal from the caliper bore and discard.

Inspection

Check the brake caliper bore for any scratches, damage or excessive wear. Clean the brake caliper bore with DOT 4 brake fluid.

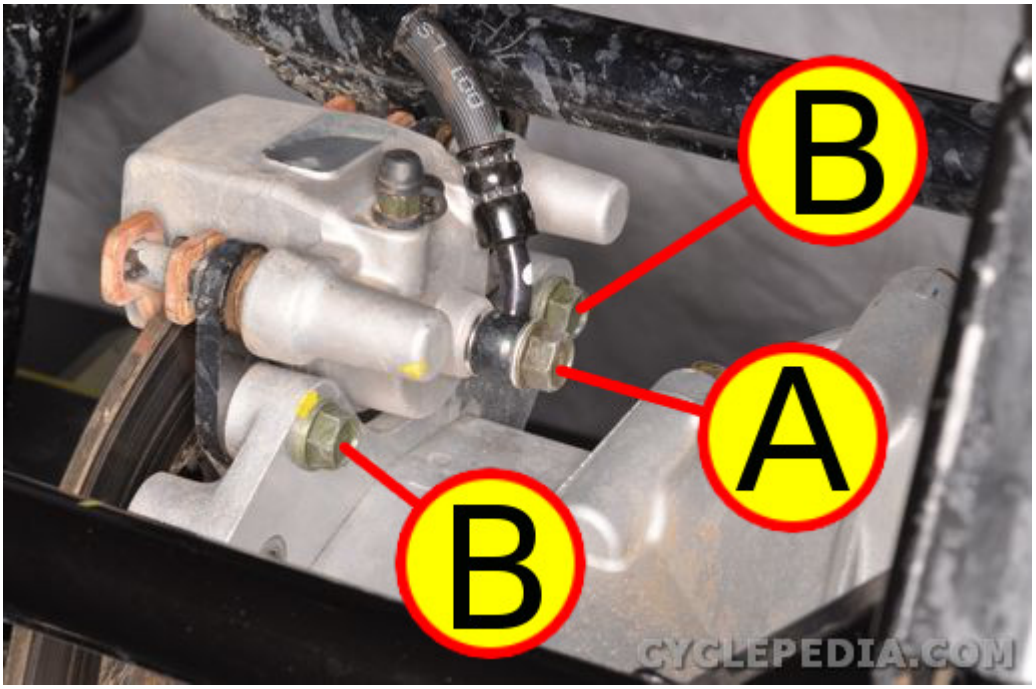
Check the piston for any scratches, damage or excessive wear. Clean the piston with DOT 4 brake fluid.

Assembly

Coat the new seals, piston, and piston bore with DOT 4 brake fluid. Install a new piston fluid seal into the inner groove. Install a new dust seal into the caliper. Install the piston into the caliper bore with the open end facing out.

Apply silicone grease to the caliper bracket pins. Install the caliper bracket.

Install the brake pads.



Fit the brake caliper into place. Guide the brake disc between the pads. Install the two brake calipers mounting bolts (B) and tighten them to specification with a 12 mm socket. Install new sealing washers and tighten the brake hose banjo bolt (A) to specification with a 12 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Rear disc holder and gear box	10	4.5 (45, 34)
Brake hose oil bolt	10	3.5 (35, 25)

Fill the master cylinder reservoir with brake fluid and bleed the brakes. See the Brake Fluid topic for more information.

Make sure the brakes work properly before riding.

Master Cylinders

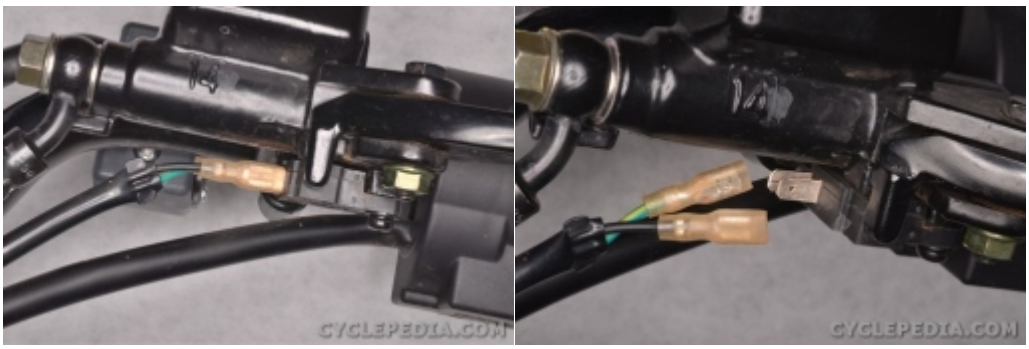
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Warning: Brake fluid is very caustic and can damage paint, chrome and plastic. Wipe up any spills immediately.

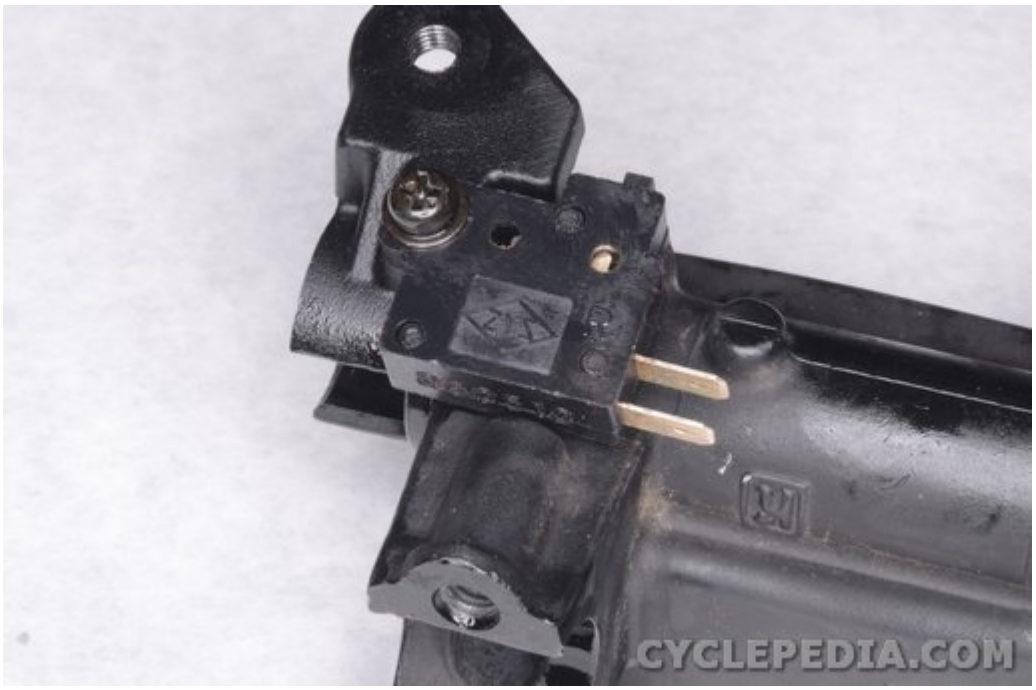
Note: The master cylinders can not be repaired. Replace the assembly with a new one if needed.

Removal

Brake Light Switches



Disconnect the rear brake light switch connectors from the switch on the left master cylinder.



To remove the left master cylinder brake light switch take out the screw with a #2 Phillips screwdriver.

The right side (front brake) master cylinder has a different style brake switch.

Compress the tabs and remove the switch from the master cylinder.

Reservoir Caps

Remove the reservoir cap screws with a #2 Phillips screwdriver.

Lift off the reservoir cap.

Remove the rubber diaphragm.

Master Cylinders

If the brake hoses are to be disconnected drain the brake fluid. See the Brake Fluid topic for more information. Remove the brake hose banjo bolt and the two sealing washers.

Loosen the brake master cylinder perch bolts with an 8 mm socket. Free the perch from the handlebar and remove the master cylinder.

Brake Levers

Hold the pivot bolt with a 10 mm socket and loosen the pivot nut with a 10 mm socket. Remove the nut and bolt.

Free the brake lever from the master cylinder.

Installation

Note: Do not splash brake fluid onto any rubber, plastic and coated parts. When working with brake fluid, use shop towels to cover these parts.

Brake Levers

Apply a light coat of waterproof grease to the pivot section of the brake lever pivot bolts.

Fit the brake lever into place.

Insert the pivot bolt from above and snug it down. Thread on the nut and tighten it securely while holding the bolt from turning. Make sure the lever moves smoothly.

Master Cylinders

Fit the master cylinder perch into place on the handlebar. Install the two mounting bolts and tighten them to specification with an 8 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Master cylinder holder bolt	6	1.2 (12, 7)
Secondary master cylinder holder and	6	1.2 (12, 7)

Connect the brake hose to the master cylinder. Use new sealing washers to each side of the hose fittings. Tighten the banjo bolt to specification.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Master cylinder holder bolt	6	1.2 (12, 7)
Secondary master cylinder holder and	6	1.2 (12, 7)

When all the brake hoses are connected, fill the master cylinders with fresh brake fluid from a tightly sealed container and bleed the brakes. See the Brake Fluid topic for more information.

Make sure the brakes work properly before riding.

Reservoir Caps

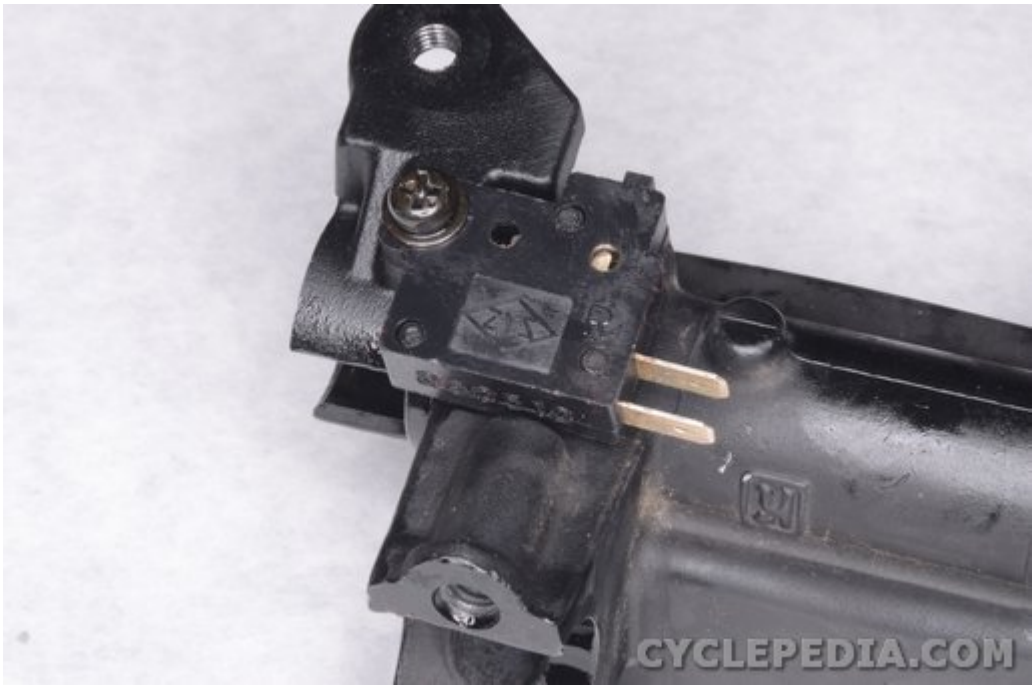
Install the rubber diaphragm (compressed) and the cap.

Install the reservoir cap screws and tighten them to specification with a #2 Phillips screwdriver.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Master cylinder cap screw	4	0.15 (1.5, 1.1)

Make sure the brakes work properly before riding.

Brake Light Switches



Install the left master cylinder brake light switch. Tighten the screw securely with a #2 Phillips screwdriver.

Plug in the rear brake light switch connectors to the switch on the left master cylinder.

Insert the right master cylinder brake light switch and be sure it locks into place.

10.Wheels

This chapter covers the location and servicing of the wheel components for the KYMCO MXU 700i and MXU 500i models.

1.Wheels 10-1
2.Wheel Bearings 10-19

TROUBLESHOOTING

Front wheel wobbling

• Bent rim
• Excessive wheel bearing play
• Bent spoke plate
• Faulty tire
• Improperly tightened axle nut

Rear wheel wobbling

• Bent rim
• Faulty tire
• Axle not tightened properly

Wheels and Wheel Hubs

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

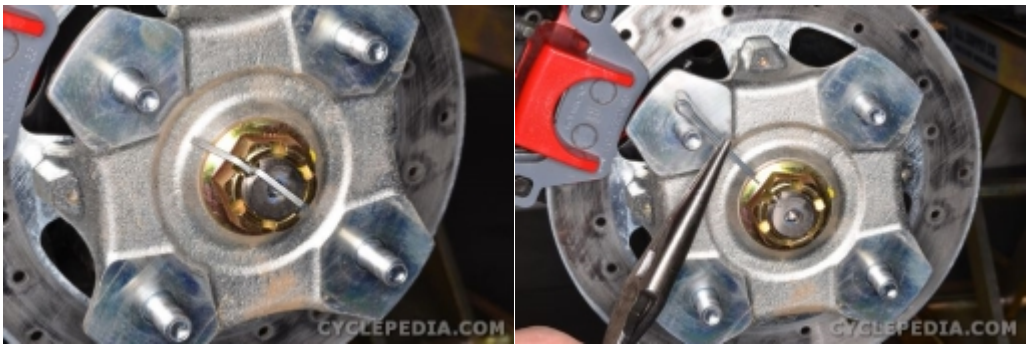
Front Wheel Removal

Break the wheel nuts loose with a 17 mm socket.

Use a jack to raise the front wheels off the ground.

Remove the four wheel nuts. Remove the front wheel.

Front Wheel Hub Removal



Remove the cotter pin and discard it.

Apply the front brakes and remove the axle nut with a 30 mm socket.

Remove the caliper. See the Front Brake Calipers topic for more information.

Note: Do not use the front brake while the caliper and brake pads are not installed on the vehicle.

Slide off the wheel hub assembly.

Front Wheel Hub Installation

Apply grease to the wheel hub splines.

Slide on the wheel hub assembly.

Thread on the wheel hub nut.

Apply the front brakes and tighten the axle nut to specification with a 30 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)	Remarks
Front wheel hub and front halfshaft(CVJ)	22	28 (280, 202)	Castle nut

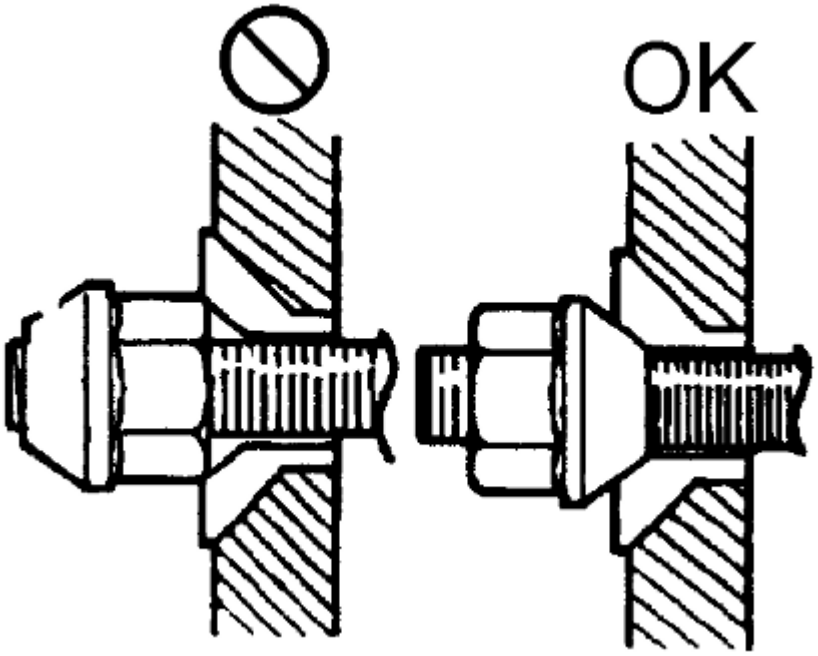
Install a new cotter pin and bend it to secure the nut.

Front Wheel Installation

Place the wheel on the hub.

Make sure the tire rotation direction is correct. The arrow indicates the direction in which the tire should turn going forward.

Thread on the wheel nuts with their curved side facing toward the wheel.



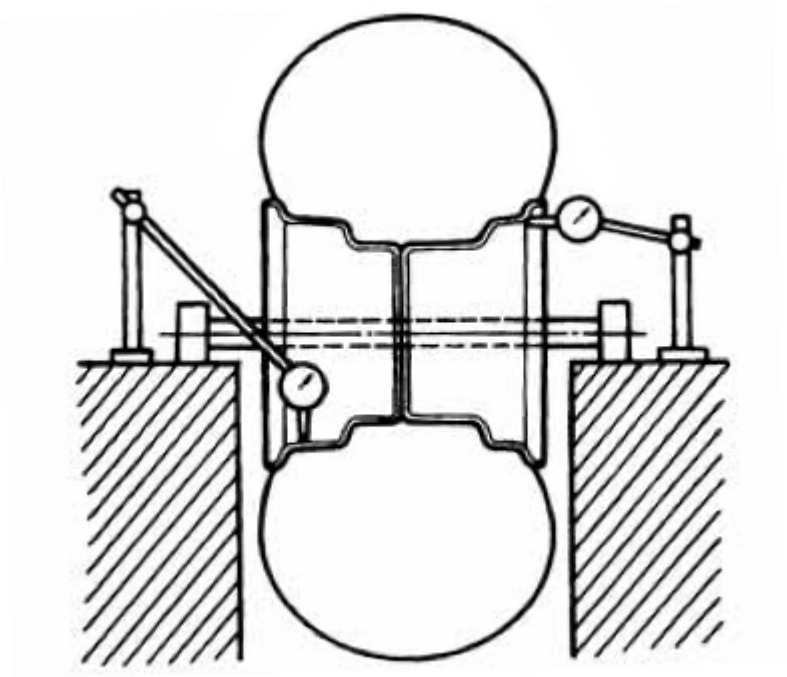
The wheel nuts can only be installed as shown.

Tighten the wheel nuts with a 17 mm socket. Lower the front wheels to the ground and torque the nuts to specification.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Front/rear wheel and hub	10	6.1 (61, 44)

Wheel Inspection

Check the wheels for damage.



Measure the wheel runout with a wheel stand and dial gauge. The lateral and vertical runout limits are both 2 mm (0.08 in).

Rear Wheel Removal

Brake the wheel nuts loose a 17 mm socket.

Use a jack to raise the rear wheels off the ground.

Remove the four wheel nuts. Remove the rear wheel.

Rear Wheel Hub Removal

Remove the cotter pin and discard it.

Apply the rear brakes and remove the axle nut with a 30 mm socket.

Slide off the wheel hub assembly.

Rear Wheel Hub Installation

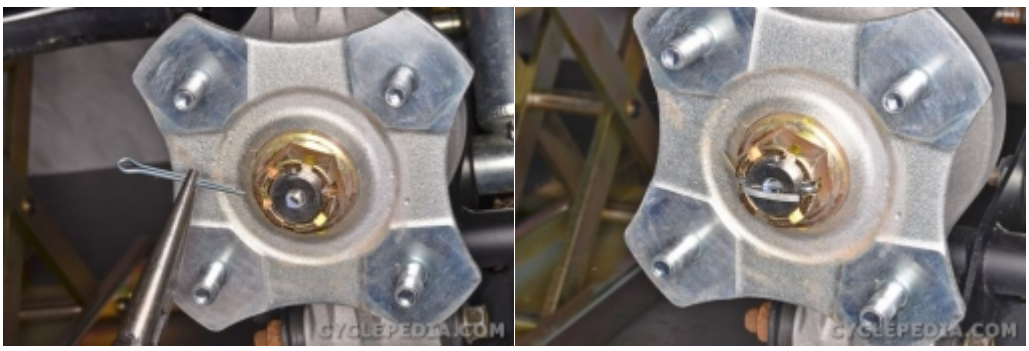
Apply grease to the wheel hub splines.

Slide on the wheel hub assembly.

Thread on the wheel hub nut.

Apply the rear brakes and tighten the axle nut to specification with a 30 mm socket.

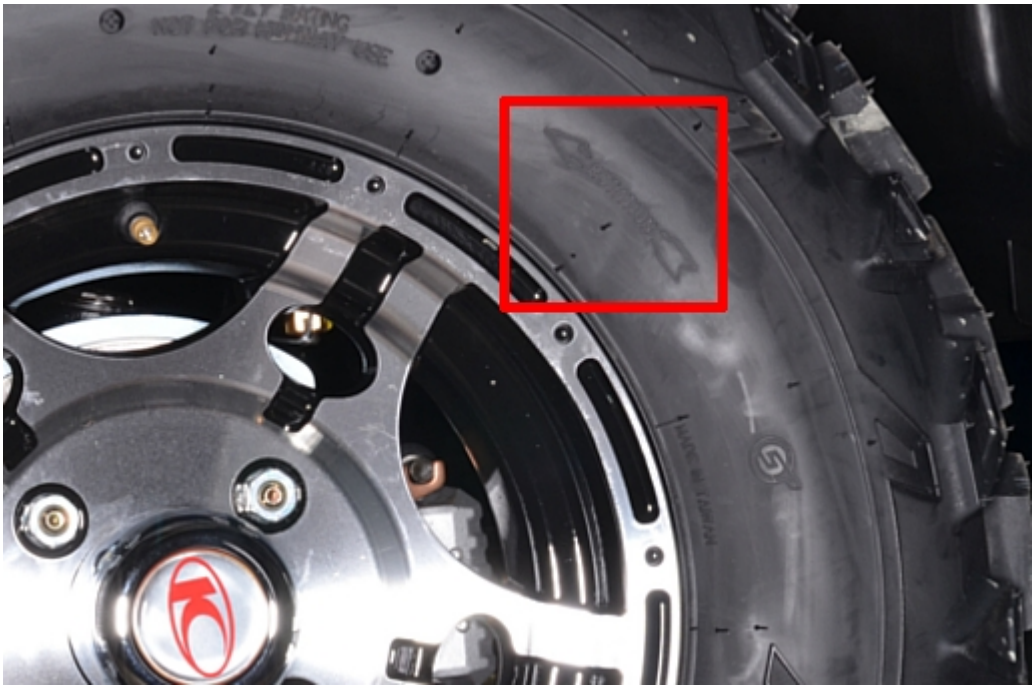
Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)	Remarks
Rear wheel hub and rear halfshaft(CVJ)	22	28 (280, 202)	Castle nut



Install a new cotter pin and bend it to secure the nut.

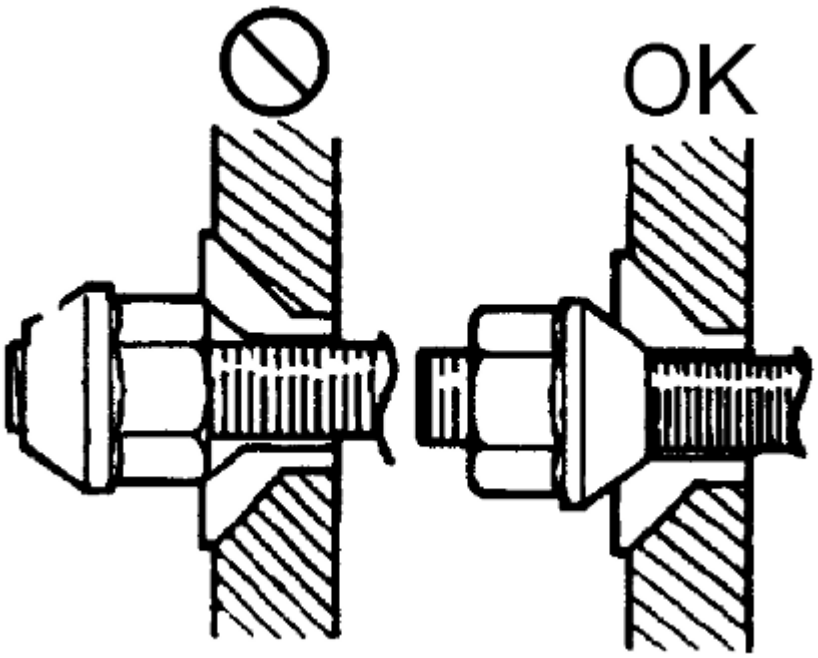
Rear Wheel Installation

Place the wheel on the hub.



Make sure the tire rotation direction is correct. The arrow indicates the direction in which the tire should turn going forward.

Thread on the wheel nuts with their curved side facing toward the wheel.



The wheel nuts can only be installed as shown.

Tighten the wheel nuts with a 17 mm socket. Lower the rear wheels to the ground and torque the nuts to specification.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Front/rear wheel and hub	10	6.1 (61, 44)

Wheel Bearings

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Front Bearings

Remove the front wheels. See the Wheels and Wheel Hubstopic for more information.

Remove the steering knuckle. See the Steering Knuckles topic for more information.

Check that the bearings rotate smoothly and do not bind. Replace as needed.

Remove the snap ring with a pair of snap ring pliers.

Drive the bearing out with a bearing driver tool from the inside out. Heat the area around the bearing to aid in removal and use a press if available.

Remove the bearing.

Note: Place the new bearing in a freezer for at least a half hour before installation. Heat the knuckle.

Fit the bearing into place.

Support the knuckle so that it sits level. Drive in a new bearing with a suitable driver with the same outside diameter as the bearing. Use a press if available. The manufactures markings on the bearing must face out.

Install the snap ring with a pair of snap ring pliers. Be sure it fits securely into its groove.

Install the steering knuckle. See the Steering Knuckles topic for more information.

Install the front wheels and hubs. See the Wheels and Wheel Hubs topic for more information.
Check the toe-in. See the Suspension and Steering Inspection topic for more information.

Rear Bearings

Remove the rear wheels and hubs. See the Wheels and Wheel Hubs topic for more information.

Remove the shock absorbers. See the Rear Shock Absorbers topic for more information.

Remove the rear knuckle. See the Rear Suspension Arms topic for more information.

Inspect the knuckle bearing by turning it with a finger if the bearing doesn't turn smoothly it must be replaced.

Remove the bearing snap ring with snap ring pliers.

Drive out the bearing from the half shaft side of the knuckle. Heat the knuckle around the bearing to aid removal. Use a press if available.

Special Tool -

Oil Seal and Bearing Driver: A120E00014

Place the new knuckle bearing in a freezer for at least a half hour before installation.

Heat the knuckle around the bearing cavity to aid installation. Drive in the new knuckle bearing from the wheel hub side of the knuckle.

Install the new bearing retainer snap ring into the groove with snap ring pliers.

Install the rear knuckle. See the Rear Suspension Arms topic for more information.

Install the shock absorbers. See the Rear Shock Absorbers topic for more information.

Install the rear wheels. See the Wheels and Wheel Hubs topic for more information.

11.Steering

This chapter covers the location and servicing of the steering components for the KYMCO MXU 700i and MXU 500i models.

1.Handlebar 11-1
2.Steering Knuckles 11-2
3.Steering Shaft 11-3
4.Tie-Rods 11-4

Hard Steering (Heavy)

- Insufficient tire pressure

Steers to one side or does not track straight

- Uneven front shock absorbers
- Bent front arm
- Bent steering knuckle

Front wheel wobbling

- Bent rim

- Excessive wheel bearing play
- Bent spoke plate
- Faulty tire
- Improperly tightened axle nut

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Handlebar

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Instrument Display and Cover

See the Instrument Cover topic.

Brake Master Cylinders

See the Master Cylinders topic.

Bar-Ends

Loosen the bar-end screw with a 6 mm Allen.

Remove the bar-end and weight from the handlebar.

Throttle and Switchgear

Remove the front fender upper cover. See the Front Fender topic for more information.

Free the wire bands from the handlebar.

Remove the three throttle cover screws with a #2 Phillips screwdriver.

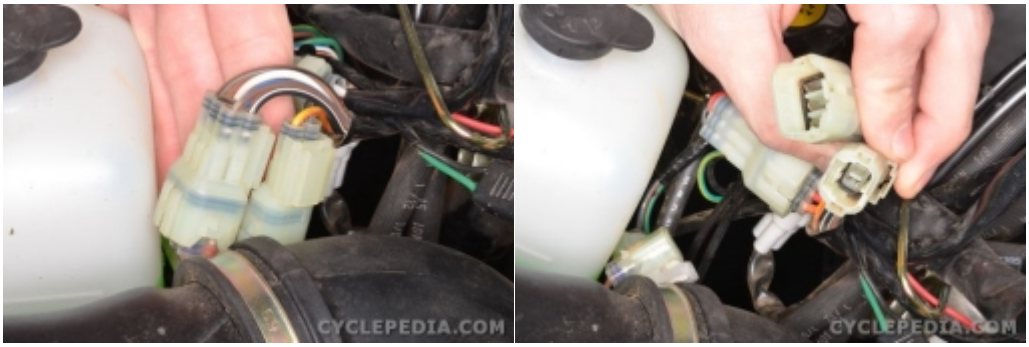
Lift off the throttle housing cover.

Free the end of throttle cable from the throttle lever.

Unscrew the throttle cable from the throttle housing.

Unplug the 2WD/4WD switch connector.

Remove the two throttle mounting screws with a #2 Phillips screwdriver. Separate the throttle perch from the handlebar.



Unplug the left handlebar switch connectors.

Loosen the switch housing screws with a #2 Phillips screwdriver.

Free the left switchgear from the handlebar.

Handlebar

Free the cables, hoses, and wires from the guides and wire bands.

Remove the four handlebar clamp bolts.

Lift off the instrument bracket.

Lift off the handlebar clamps.

Lift off the handlebar.

Grips

If you plan to replace the grips you can slice them lengthwise with a razor blade and peel them off. To remove the grips without cutting them grip end bolts, then use a screwdriver to open a gap between the grip and the handlebar. Spray in contact cleaner to break up the grip cement. Use compressed air to expand the grip so it can be easily slid off the end of the handlebar. Note the relationship between the angle of the grip and the bar so that the new grip can be installed with the correct angle.

NOTE: Always wear safety glasses when using compressed air and never point it directly at yourself or anyone else.

Before installing the grips to the handlebar, wipe down the area with a brake or parts cleaner that will dry without leaving a residue. When you are sure the area is dry apply grip cement to the bar or tube. Install the grips at an angle of your preference. Install the grip end bolts and tighten them to specification.

Installation

Handlebar

Fit the handlebar into place.

Set the handlebar clamps into place.

Set the instrument bracket into place.

Install the four handlebar clamp bolts.

Make sure the handlebar is positioned so that the punch mark lines up as shown.

Tighten the handlebar clamp bolts evenly to specification with a 12 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
HANDLEBAR AND STEERING POST	M8 X 1.25	2.4-3.2	24-32	20

Route the cables, hoses, and wires through the guides and secure them with the wire bands as shown.

Throttle and Switchgear

Fit the left switch gear onto the handlebar. Guide the post into its hole.

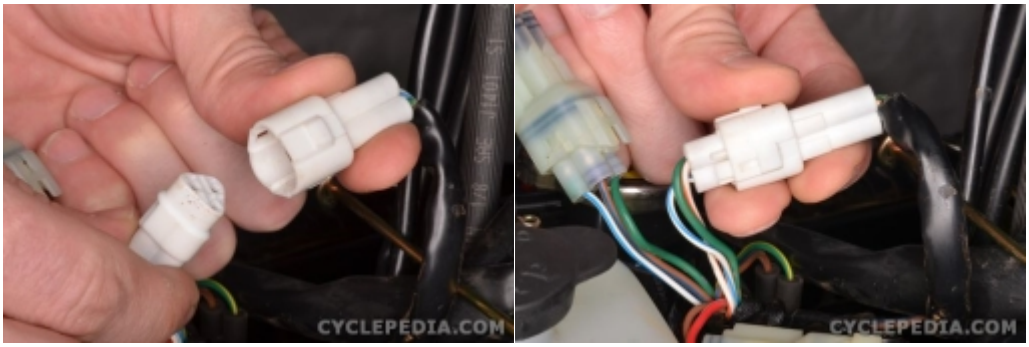
Install the two switch gear housing screws and tighten them securely with a #2 Phillips screwdriver.

Plug in the left handlebar switch connectors.

Fit the throttle housing and 2WD/4WD switch into place. Install the two throttle housing perch screws and tighten them securely with a #2 Phillips screwdriver.

Thread the throttle cable into the throttle housing.

Connect the end of the throttle cable to the throttle lever.



Plug in the 2WD/4WD switch connector.

Install the throttle housing cover. Install the three throttle housing cover screws and tighten them securely.

Secure the wires to the handlebar with wire bands as shown.

Bar-Ends

Slide the bar-end and weight into the handlebar.

Tighten the bar-end screw with a 6 mm Allen to secure the bar-end.

Master Cylinders

See the Master Cylinders topic.

Instrument Display and Cover

See the Instrument Cover topic.

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Steering Knuckles

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

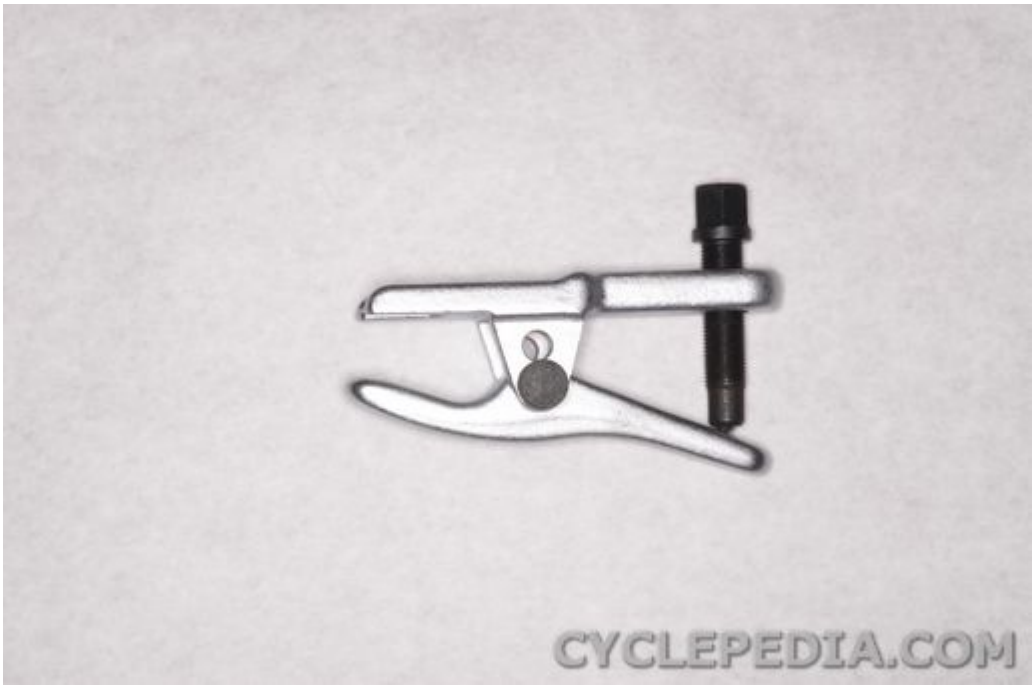
Make sure the vehicle is securely supported with the front end off the ground.

Remove the front wheels and hubs. See the Wheels and Wheel Hubs topic for more information.

Remove the tie rod ends from the steering knuckles. See the Tie Rods topic for more information.

Remove the two steering knuckle bolts with a 14 mm socket.

Remove the steering knuckle from the upper and lower A-arms.



Use the ball joint separator tool to separate the suspension arm joints from the knuckle if needed.

Note: Use a ball joint remover if needed.

To remove the front drive shafts see the Drive Shafts topic.

To replace the bearings in the knuckle, see the Wheel Bearings topic.

Installation

Install the steering knuckle onto the drive shaft, upper and lower A-arms. Guide the A-arm ball joint into the knuckle at the bottom.

Install the two steering knuckle bolts and tighten to specification with a 14 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
FRONT KNUCKLE AND FRONT UPPER/LOVER ARM	M10 X1.25	4.8	48	34

Install the tie rod ends into the steering knuckles. See the Tie Rods topic for more information.

Install the front wheels and hubs. See the Wheels and Wheel Hubs topic for more information.

Check the toe-in. See the Suspension and Steering Inspection topic for more information.

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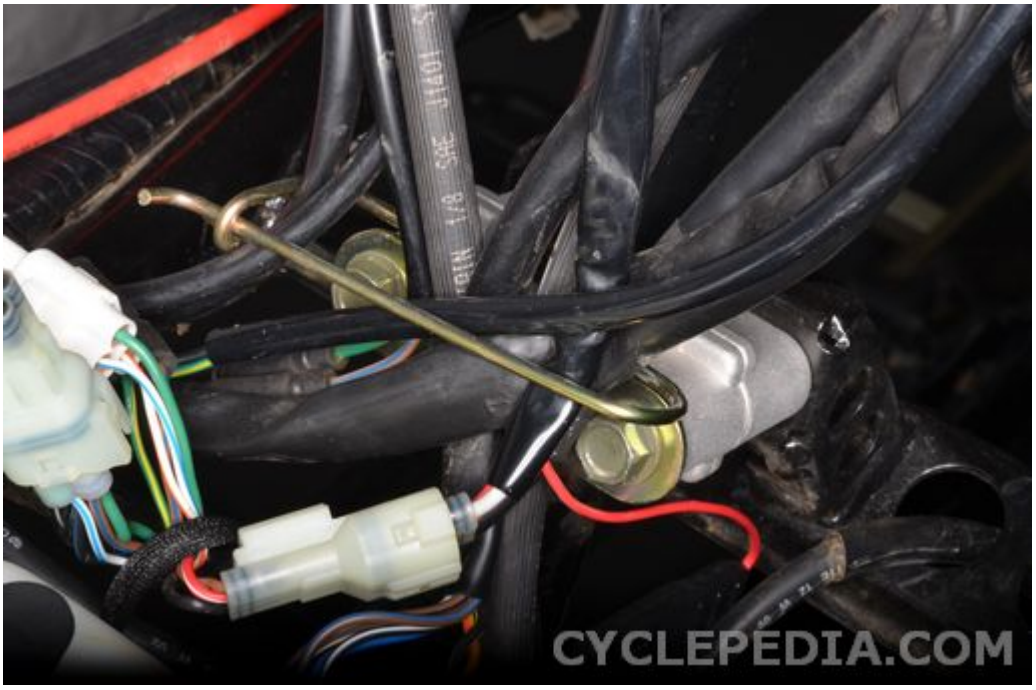
Steering Shaft

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Remove these components	
Component	Topic
Front rack	Racks
Side covers	Side Covers
Fuel tank	Fuel Tank
Mudguards	Mudguards and Footrests
Front fender	Front Fender
Handlebar	Handlebar

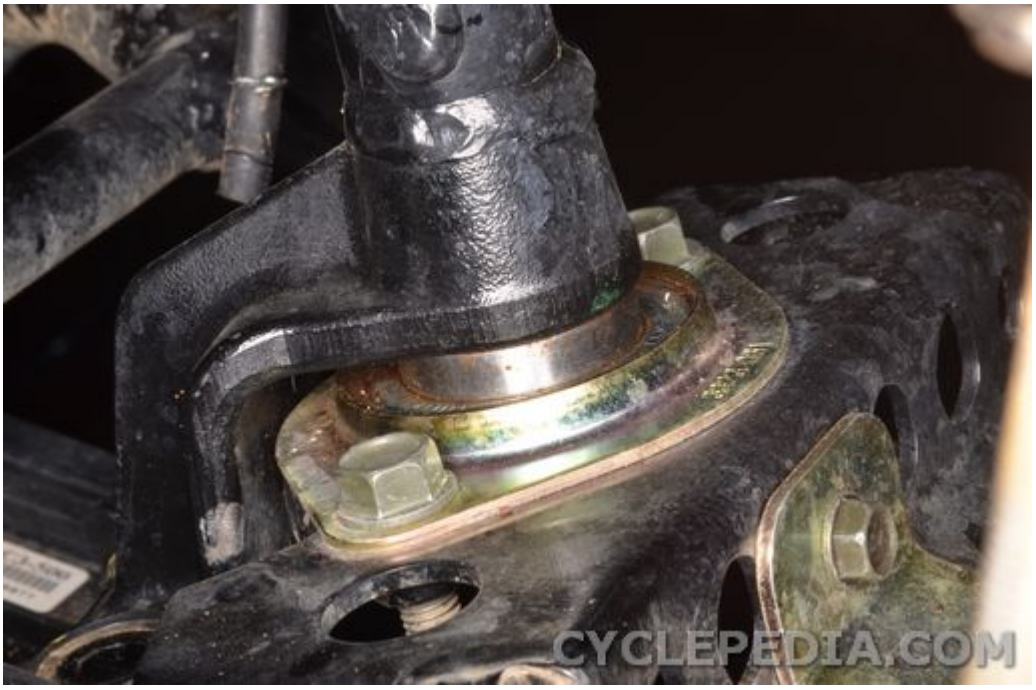


Open the guide and free the wires, throttle cable and brake hoses.

Free the inner ends of the tie-rods from the steering shaft. See the Tie-Rods topic for more information.

Loosen and remove the two steering shaft bushing bolts with a 10 mm socket.

Remove the steering shaft bushing cap and the bushing.



Remove the two steering shaft bearing flange bolts with a 12 mm socket.

Lift the steering shaft up and free the bearing from the frame.

Lift the steering shaft up and out of the frame.

Inspect the steering shaft for bends and damage.

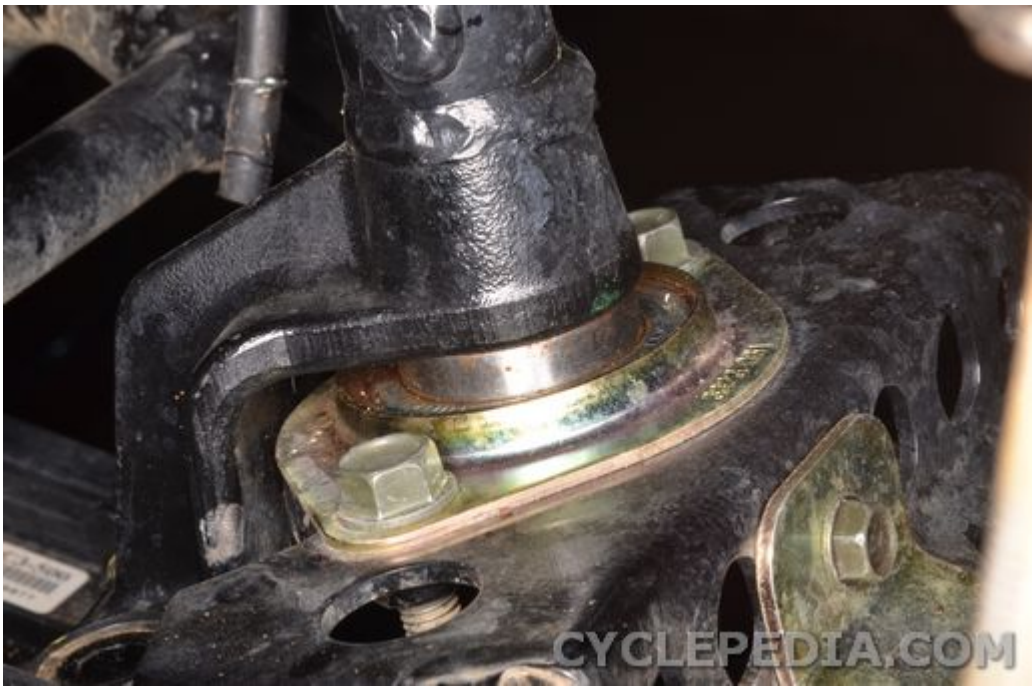
If the steering shaft bearing needs to be replace remove the bolt with a 14 mm socket.

Installation

Install the bearing plate, bearing, washer and bolt. Tighten the bolt to specification with a 14 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Steering post lower pivot	10	5.5 (55, 40)

Fit the steering shaft into place. Guide the bearing into its socket in the frame.



Thread in the steering shaft bearing flange bolts. Tighten the bolts to specification with a 12 mm socket.

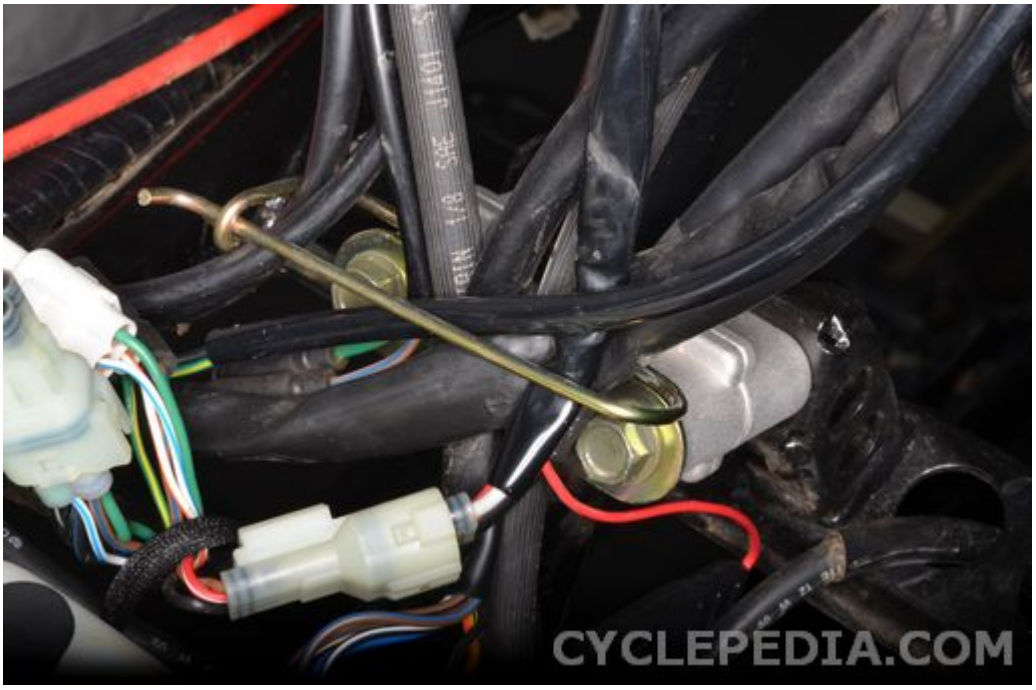
Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Bearing flange and frame	10	2.8 (28, 20)

Lubricate the steering shaft bushing with waterproof grease. Install the bushing.

Install the bushing cap and the two steering shaft bushing bolts.

Tighten the steering shaft bushing bolts securely with a 10 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Upper/lower housing and frame	8	2.7 (27, 19)



Route the wires, throttle cable and brake hoses through the guide and close the guide.

Connect the inner ends of the tie-rods to the steering shaft. See the Tie-Rods topic for more information.

Check the toe-in. See the Suspension and Steering Inspection topic for more information.

Install these components	
Component	Topic
Front fender	Front Fender
Front rack	Racks
Mudguards	Mudguards and Footrests
Fuel tank	Fuel Tank
Side covers	Side Covers
Handlebar	Handlebar

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Tie-Rods

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

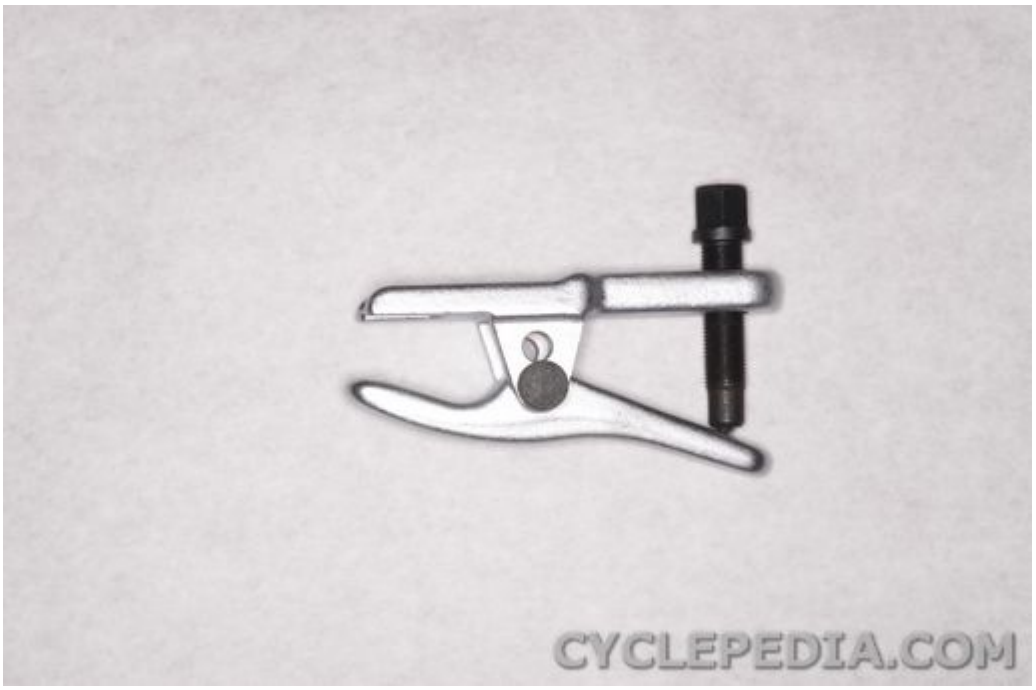
Removal

Remove the front wheels. See the Wheels and Wheel Hubs topic for more information.

Remove the cotter pin from the outer tie-rod nut and discard it.

Hold the tie-rod joint with a 14 mm wrench and loosen the nut with a 17 mm socket.

Remove the tie-rod end nut. Free the tie-rod end from the steering knuckle.

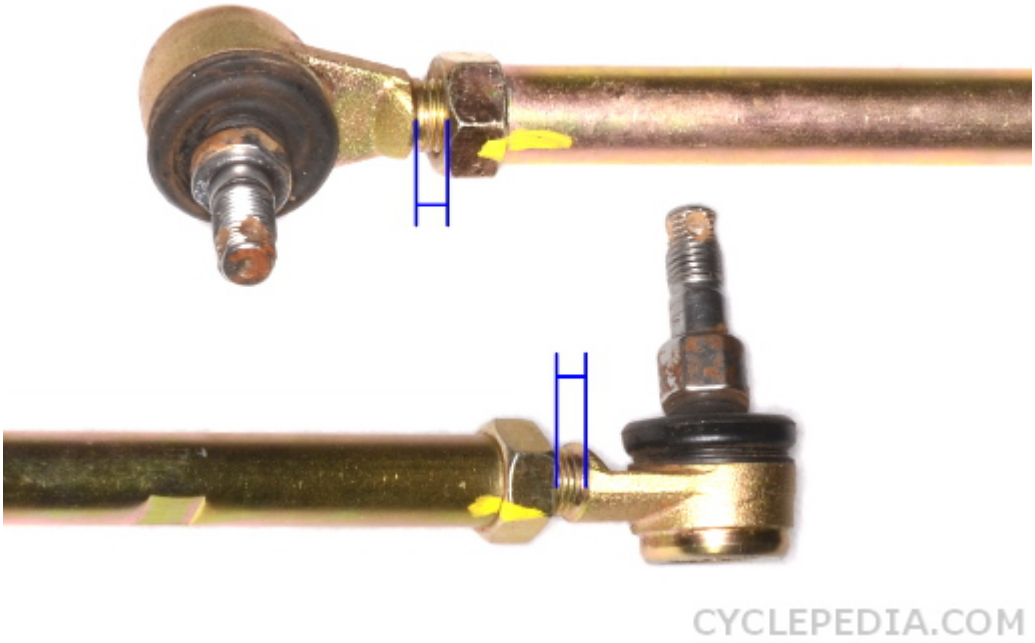


Use the special ball joint separator tool if needed to separate the end of the tie-rod form the knuckle If needed.

Remove the cotter pin from the inner tie-rod nut and discard it.

Hold the tie-rod joint with a 14 mm wrench and loosen the nut with a 17 mm socket. Free the inner tie-rod joint from the steering shaft. Remove the tie-rod.

Inspect the tie-rods for damage. Make sure the joint boots are in good condition and the joints move smoothly. Replace the joints and boots as needed if they are in poor condition.



Both ends of the tie-rod should have the same amount of threads showing.

Installation

Fit the tie-rod into place.

The adjuster flat on the tie rod should sit on the outside.

Thread on the inner tie-rod joint nut. Hold the inner tie-rod joint with a 14 mm wrench and tighten the nut to specification with a 17 mm socket. Install a new cotter pin and bend it to secure the nut.

Item	Thread dia. (mm)	Torque

		Kgf-m (N-m, ft-lb)
Steering stem and tie-rod	10	4.2 (42, 30)

Install the outer tie-rod end into the steering knuckle. Install the tie-rod end nut.

Hold the tie-rod joint with a 14 mm wrench and tighten the nut to specification with a 17 mm socket.

Item	Thread dia. (mm)	Torque Kgf-m (N-m, ft-lb)
Steering knuckle and tie-rod	10	4.2 (42, 30)

Install a new cotter pin onto the tie-rod joint nut.

Install the front wheels and hubs. See the Wheels and Wheel Hubs topic for more information.

Check the toe-in. See the Suspension and Steering Inspection topic for more information

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12.Front Suspension

This chapter covers the location and servicing of the front suspension components for the KYMCO MXU 700i and MXU 500i models.

A-arms 12-2
Front Shock Absorbers 12-11

TROUBLESHOOTING

Hard steering (heavy)

• Insufficient tire pressure

Steers to one side or does not track straight

• Uneven front shock absorbers
• Bent front arm
• Bent steering knuckle

Front shock absorber noise

• Slider bending
• Loose arm fasteners
• Lack of lubrication

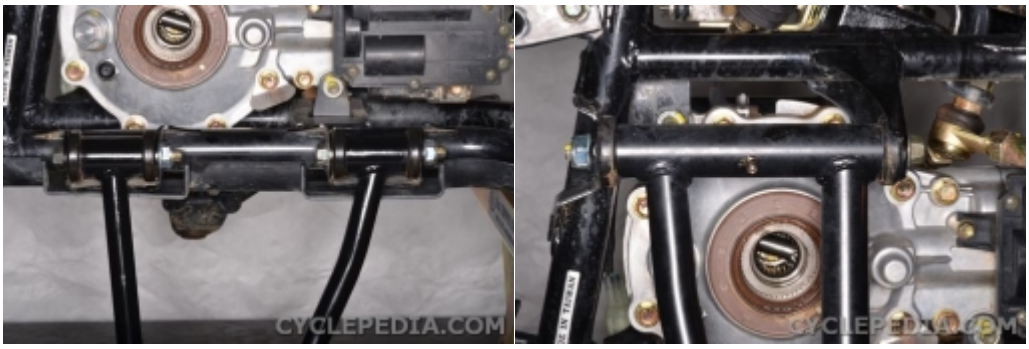
Soft front shock absorber

• Weak shock springs
• Insufficient damper oil

A-arms

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

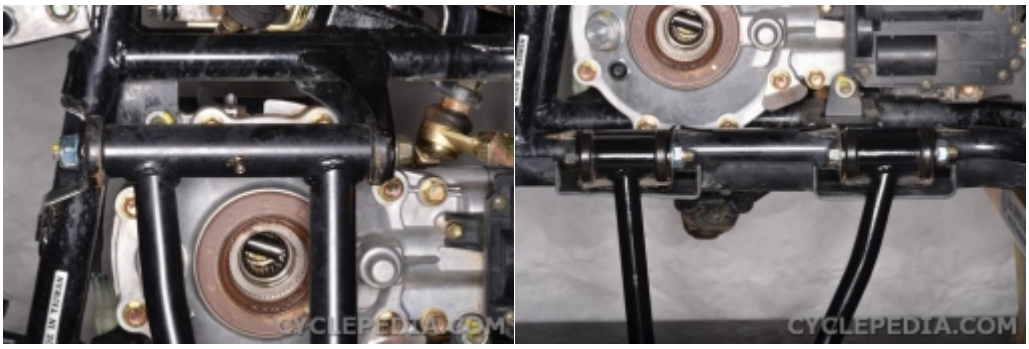


Move the suspension arms up and down. Also, try to move them front to back. If there is excessive play or noise, the bushings may need to be replaced.

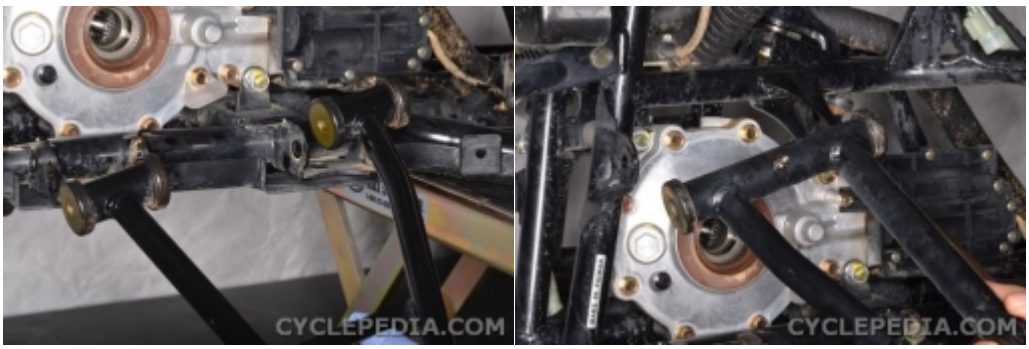
Removal

Remove these components	
Component	Topic
Front wheels and hubs	Wheels and Wheel Hubs
Steering knuckles	Steering Knuckles
Front shock absorbers	Front Shock Absorbers

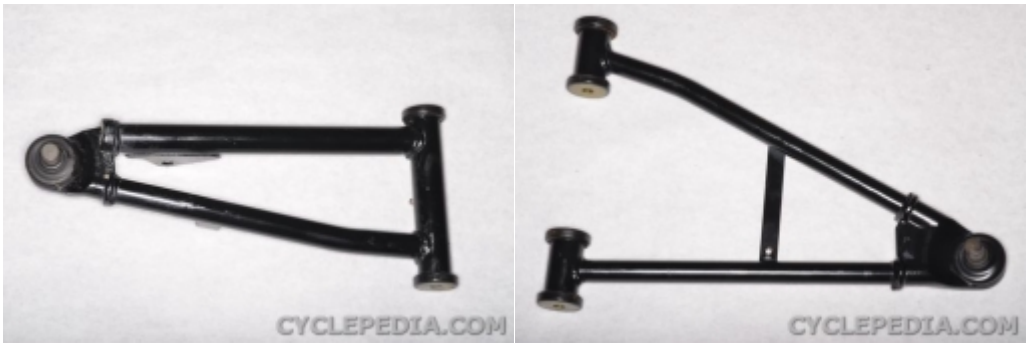
Remove the brake hose stay and free the brake hoses from the upper A-arms.



The lower A-arms have two pivot bolts and nuts. The upper A-arms have a single pivot bolt and nut. Hold the bolt with a 14 mm wrench and loosen the nut with a 17 mm socket. Remove the A-arm pivot bolts and nuts.



Remove the A-arms.

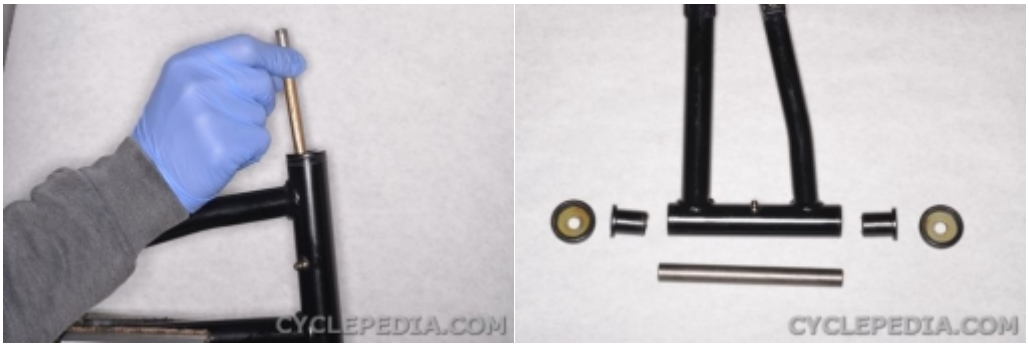


Check the suspension arms for signs of damage.

Bushing Replacement

Upper A-arm

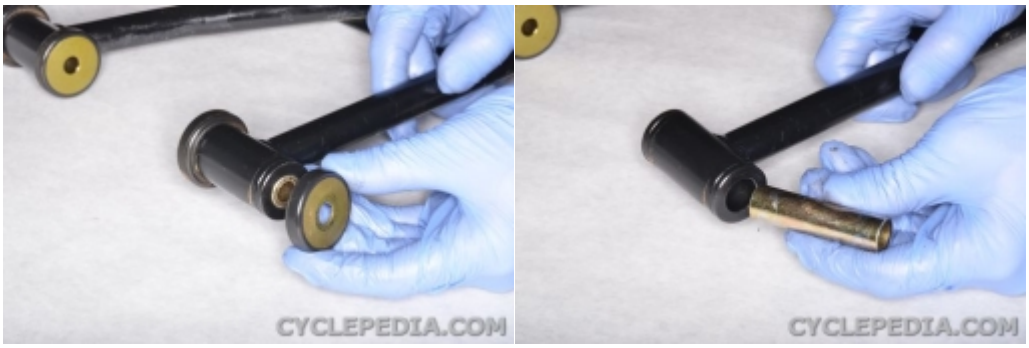
Remove the dust seals from the upper A-arm pivots. Remove the collars. Inspect the collars and bushings.



Remove the bushings with a suitable bearing puller, or tap them out using a drift pin and a hammer.

Press in the new bushings with a press, or tap them in with a soft-blow hammer.

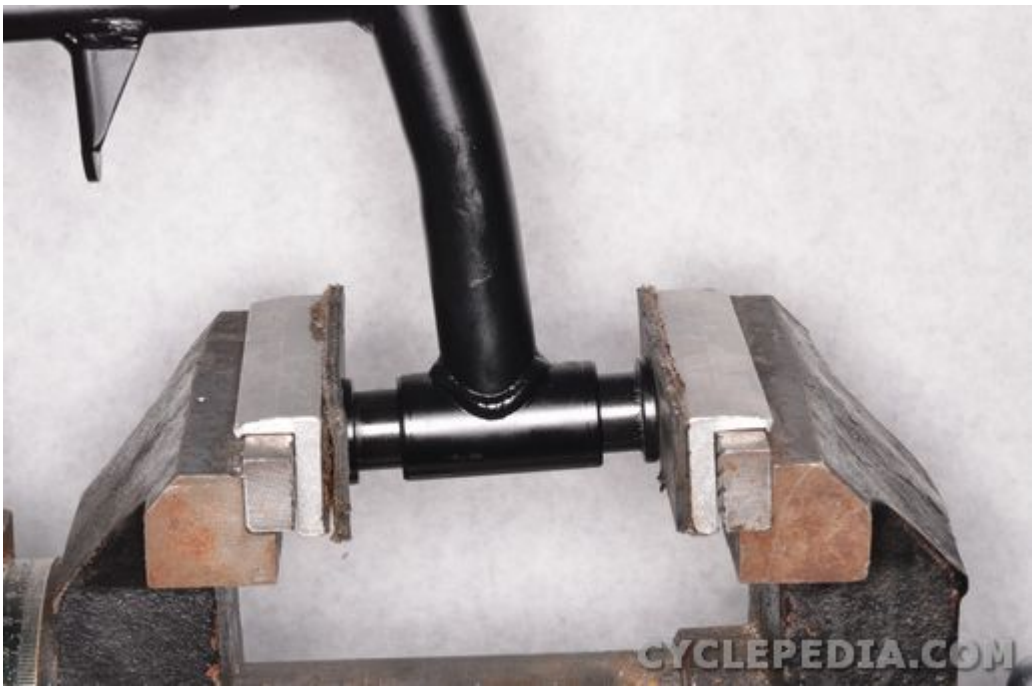
Lower A-arm



Remove the dust seals from the lower A-arm pivots. Remove the collars.

Inspect the collars and bushings.

Remove the bushings with a suitable bearing puller or tap the bushings out with a drift pin and hammer.

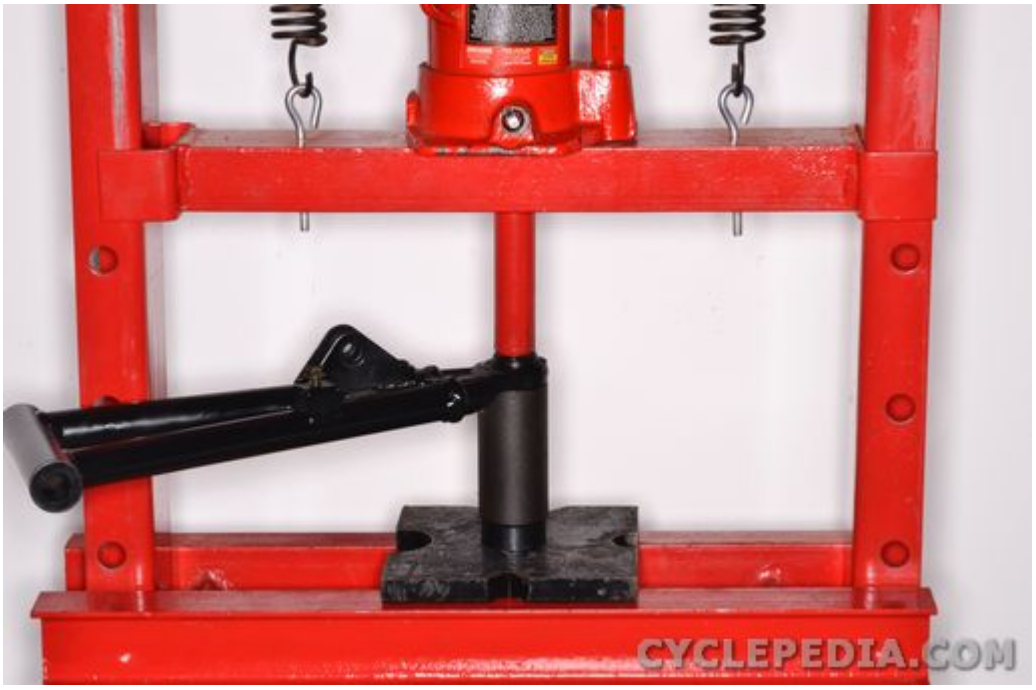


Install the new bushings with a vise or a press.

Knuckle Ends

Check the knuckle ball joint boot for wear or damage and replace as needed.

Remove the snap with snap ring pliers on the back of the ball joint.



Support the A-arm with a suitable tool as shown that will allow room for the ball joint to fall out. Press out the ball joint.

Clean the ball joint mount in the A-arm.

Apply green Loctite #609 to the entire outside diameter of the bail joint.

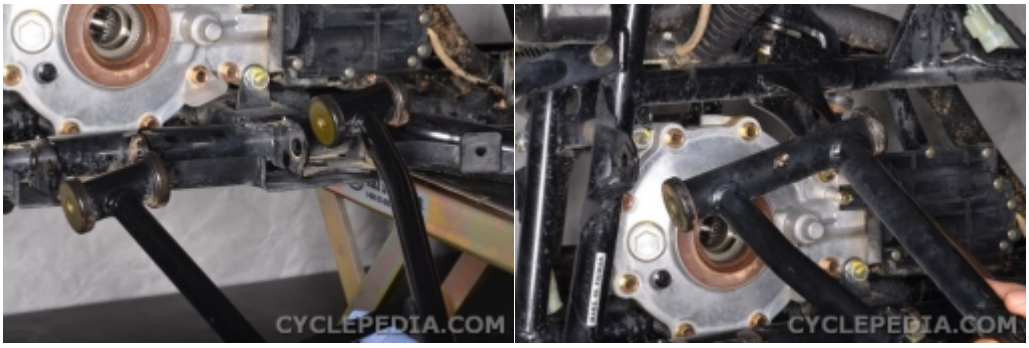
Support the A-arm with a suitable tool as shown that will allow room for the ball joint to be installed. Press the ball joint into the A-arm.

Install the new snap ring on the back of the knuckle end with snap ring pliers. Be sure the snap ring sits in the groove properly.

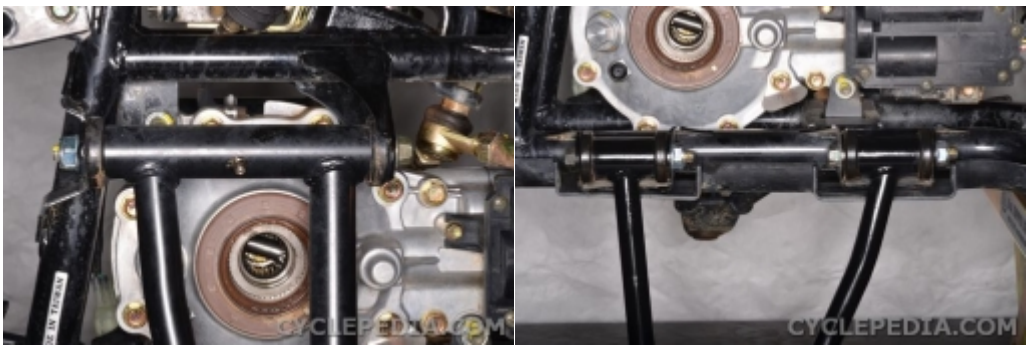
Installation

Use new locknuts with the suspension pivot bolts.

Install the collars and dust seals.



Be sure to return the A-arms to their correct positions.



Install the A-arms. The ball joints must face up on the lower arms and down on the upper arms.

Insert the A-arm mounting bolts from the front. Hold the bolts with a 14 mm socket and tighten the nuts to specification with a 17 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
FRONT UPPER/LOWER ARM AND FRAME	M10 X1.25	4.8	48	35

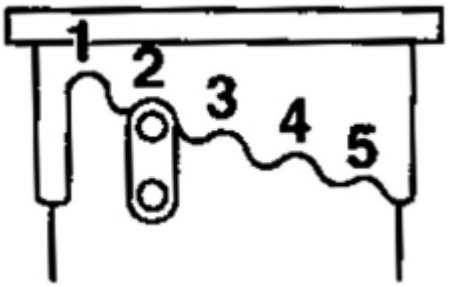
Fit the brake hose stay to the upper A-arm and install the bolt securely.

Install these components	
Component	Topic
Front shock absorbers	Front Shock Absorbers
Steering knuckles	Steering Knuckles
Front wheels and hubs	Wheels and Wheel Hubs

Front Shock Absorbers

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Preload



The shock absorbers have adjustable preload collars, just like the rear shocks.

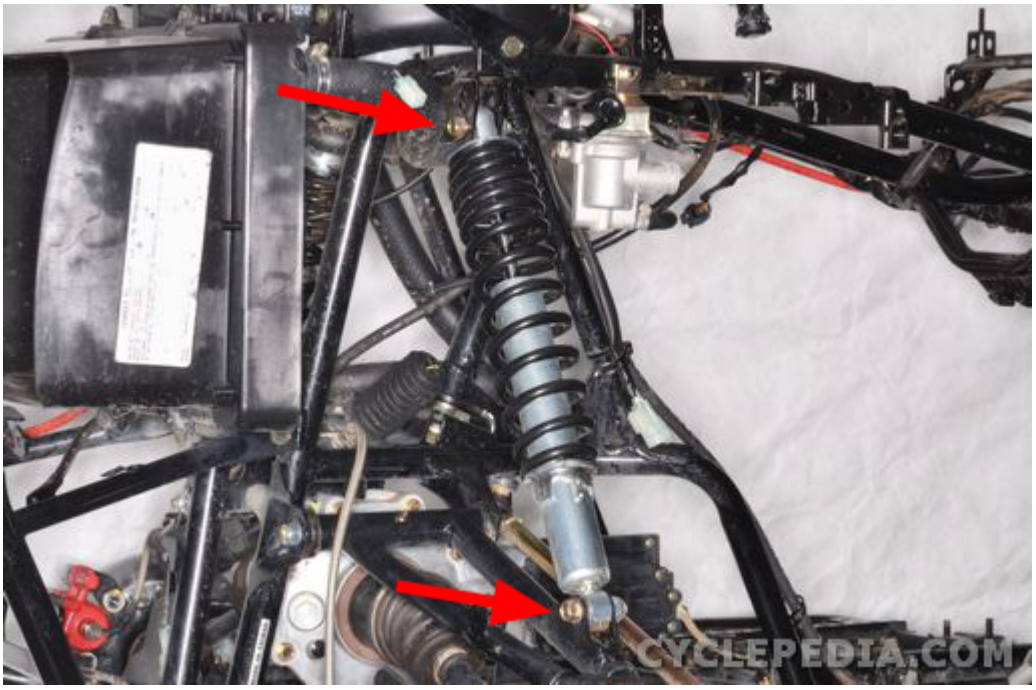
Turn the preload collar with a pin spanner to adjust the spring preload. Increase the amount of preload for heavy loads.

Removal

Support the front of the vehicle with a suitable stand or jack so that the front wheels are off of the ground.

Remove the front wheels. See the Wheels and Wheel Hubs topic for more information.

Note: The front shock absorber removal procedure is the same for both sides.



Hold the lower shock absorber mounting bolt with a 14 mm wrench and loosen the nut with a 17 mm socket. Remove the lower shock absorber mounting nut and bolt. Hold the upper shock absorber mounting bolt with a 14 mm wrench and loosen the nut with a 17 mm socket. Remove the upper shock absorber mounting nut and bolt.

Remove the shock absorber.

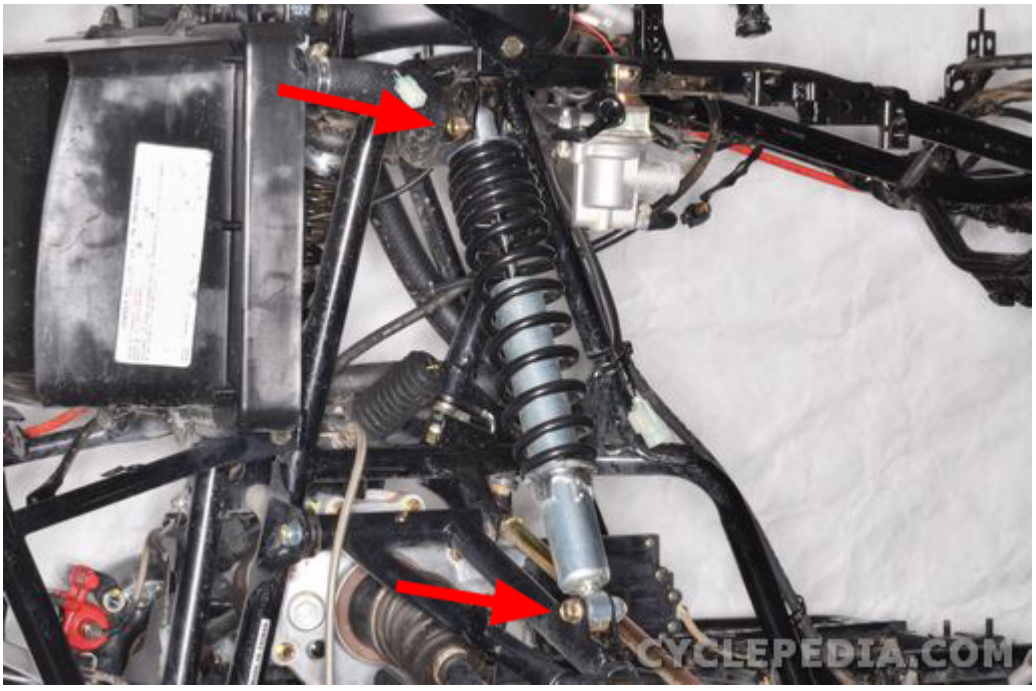
Inspection

Inspect the shock absorber for damage, leaks or other wear. Replace the shock absorber with a new one as needed.

Installation

Use new locknuts with the suspension pivot bolts.

Install the shock absorber.



Install the upper and lower mounting bolts and nuts. Insert the bolts from the front.

Hold the upper shock absorber mounting bolt with a 14 mm wrench and tighten the nut to specification with a 17 mm socket. Hold the lower shock absorber mounting bolt with a 14 mm wrench and tighten the nut to specification with a 17 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
FRONT SHOCK UPPER JOINT AND FRAME	M10 X1.25	4.8	48	35
FRONT UPPER/LOWER ARM AND FRAME	M10 X1.25	4.8	48	35

Install the front wheels. See the Wheels and Wheel Hubs topic for more information.

EPS (Only EPS Model)

This chapter covers the location and servicing of the steering components for the KYMCO MXU 500i EPS and MXU 700i EPS models.

EPS Operation

The EPS module calculates steering assist by sensing the difference between the input torque of the steering and the output torque required to turn the wheels, and then provides assist by energizing an electric motor. The process provides a smooth seamless assist.

The system is continuously running diagnostic checks and monitoring factors such as battery voltage, ground speed and engine speed. In the event an internal or external issue that affects the EPS system is detected, the system will illuminate a fault indicator and transition to a normal mechanically coupled steering system.

Hard Steering (Heavy)

- Insufficient tire pressure
- EPS does not work

GENERAL SPECIFICATIONS

Torque Specification

No.	Item	Torque			Remark
		kgf.m	N.m	ft.lb	
1	Handlebar To Steering Post	2.4~3.0	24~30	17.4~21.7	M10x1.25
2	Houing With Frame	2.4~3.0	24~30	17.4~21.7	M8x1.25
3	Steering Post with EPS unit	2.4~3.0	24~30	17.4~21.7	M10x1.25
4	EPS Unit With Frame	2.4~3.0	24~30	17.4~21.7	M8x1.25
5	EPS Output Shaft And Pitman Arm	11~13	110~130	79.6~94	M16x1.5
6	Wheels (Aluminum/ Steel)	5.6~6.5	56~65	40.5~47	M10x1.25
7	Shock Mounting Bolts	4.1~5.6	41~56	29.7~40.5	M10x1.25

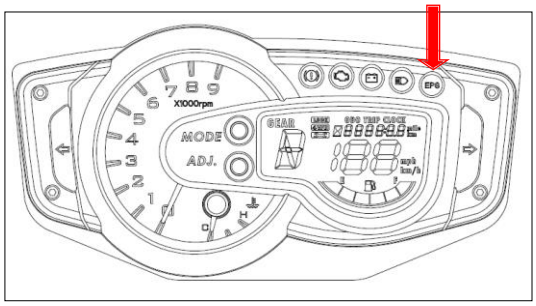
General Specification:

No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	6mm Bolt and Nut	0.8~1.2	8~12	5.8~8.7
2	8mm Bolt and Nut	1.8~2.5	18~25	13~18.1
3	10mm Bolt and Nut	3.4~4.0	30~40	24.6~28.9
4	12mm Bolt and Nut	5.0~6.0	50~60	36.2~43.4
5	14mm Bolt and Nut	6.0~8.0	60~80	43.4~57.9

General Safaty:

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

EPS indicator (EPS Model only)



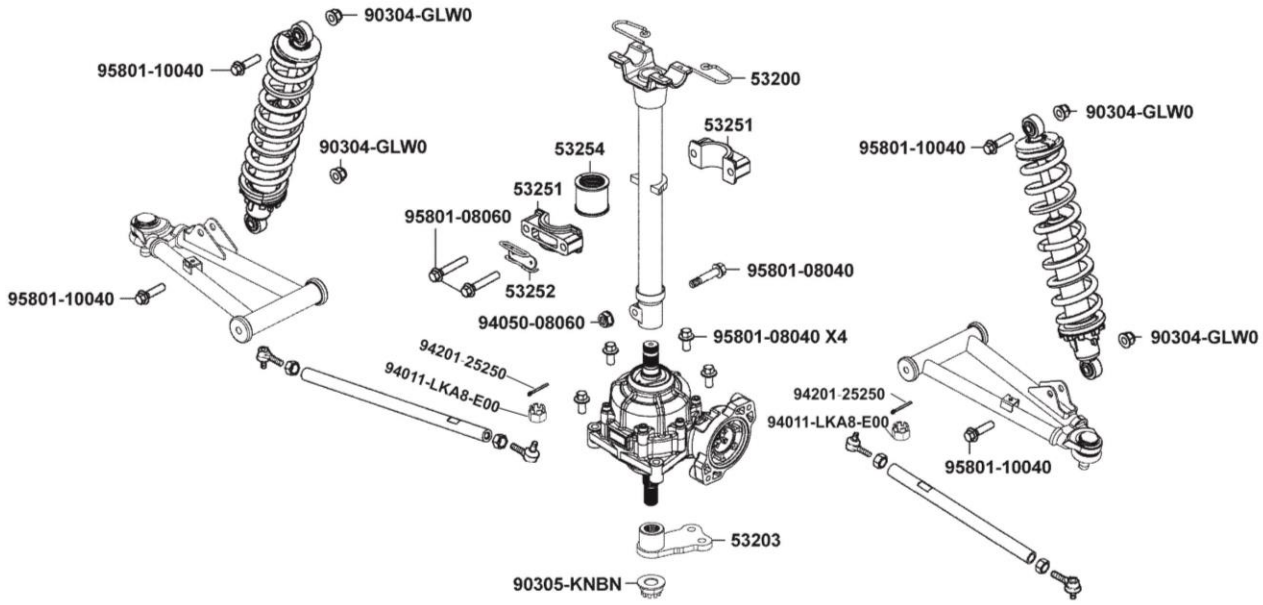
The EPS indicator illuminates when the key is turned to the ON position and will goes off after 3 seconds. If the light remains on, the EPS system is inoperative.

Electronic power steering engages when the ignition key is turned to the ON position. EPS remains engaged whether the vehicle is moving or idle.

NOTE:

KYMCO recommends steering component repair and adjustment be performed by an authorized KYMCO Dealer. Only a qualified technician should replace worn or damaged steering parts. Use only genuine KYMCO replacement parts.

Explore View



⚠CAUTION

- If the EPS control module is replaces, Set the EPS system to the netral position. If not set to the neutral position, the system may not operate correctly.
- Do not drop the EPS control module. Replace the EPS control module if it subjected to an impact.

Power Steering Unit Removal

EPS Removal

Instrument Display and Cover

Remove the two screws with a #2 Phillips screwdriver.

IMPORTANT: Take note of wire harness and throttle cable routing for reassembly purposes.

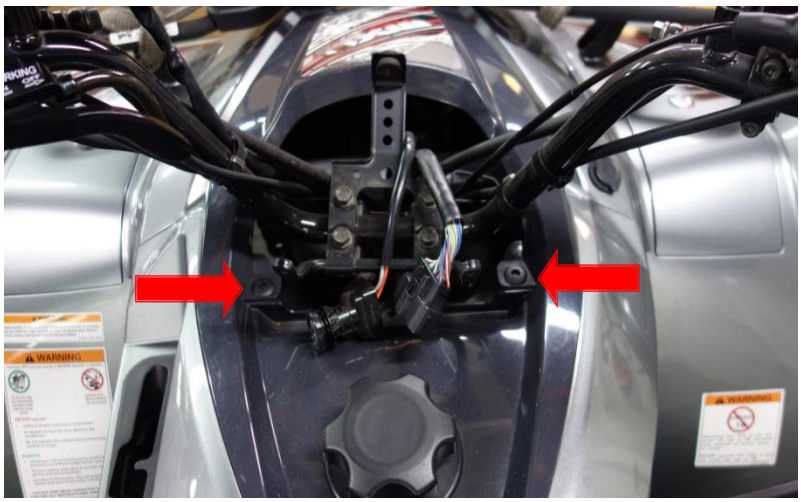
Slide the instrument cover forward and free it from the rubber grommet.

Unplug the connector from the back of the instrument display.

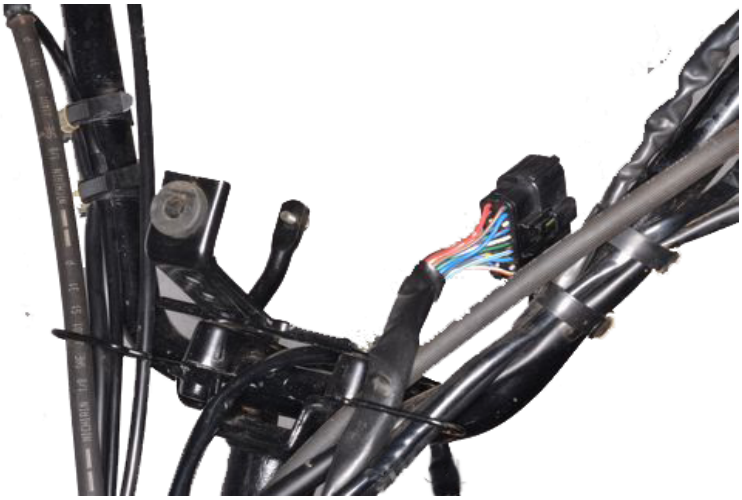
Unscrew the ring around the main switch.

IMPORTANT: Take care not to bend the throttle cable or brake line while the handlebar is removed.

Remove the main switch from the instrument cover.

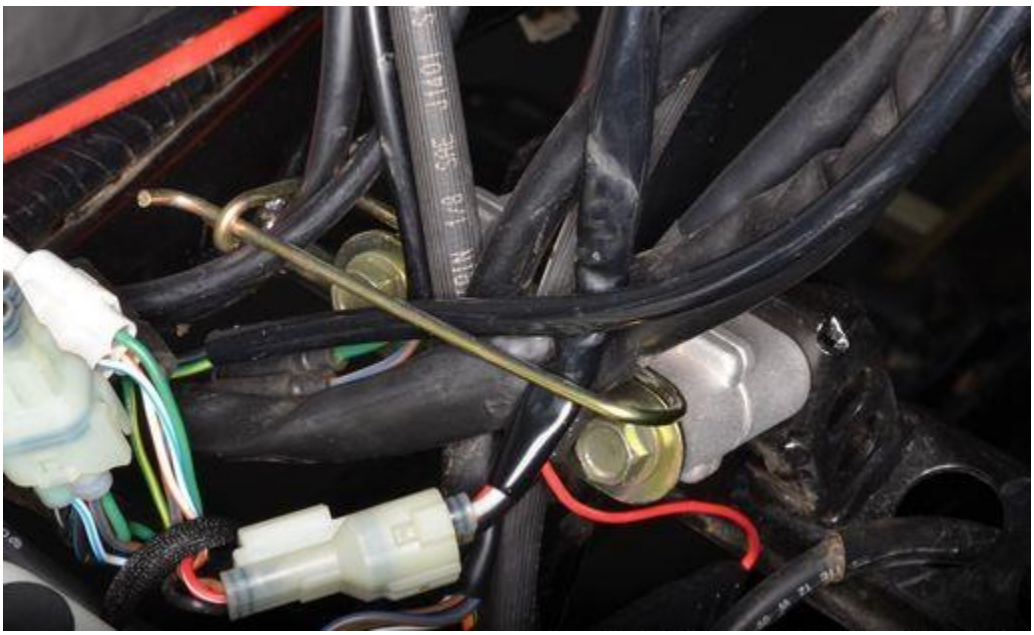


Removal the front cover



Free the cables, hoses, and wires from the guides and wire bands.

Carefully remove the four handlebar clamp bolts from the steering post.



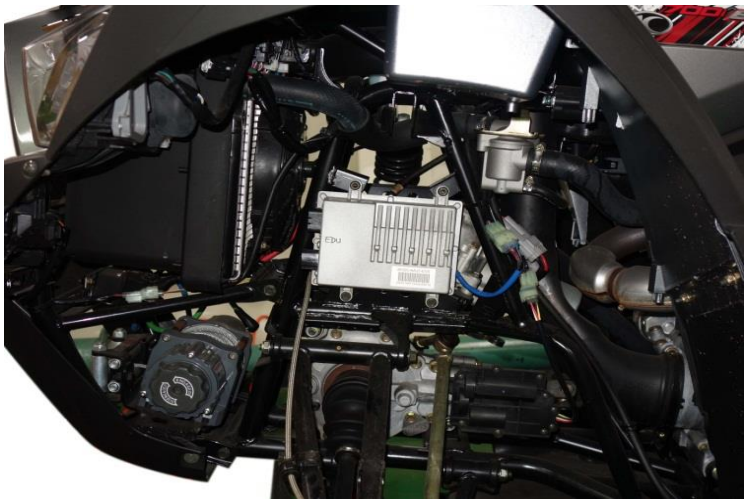
Open the guide and free the wires, throttle cable and brake hoses.

Loosen and remove the two steering shaft bushing bolts with a 10 mm socket.

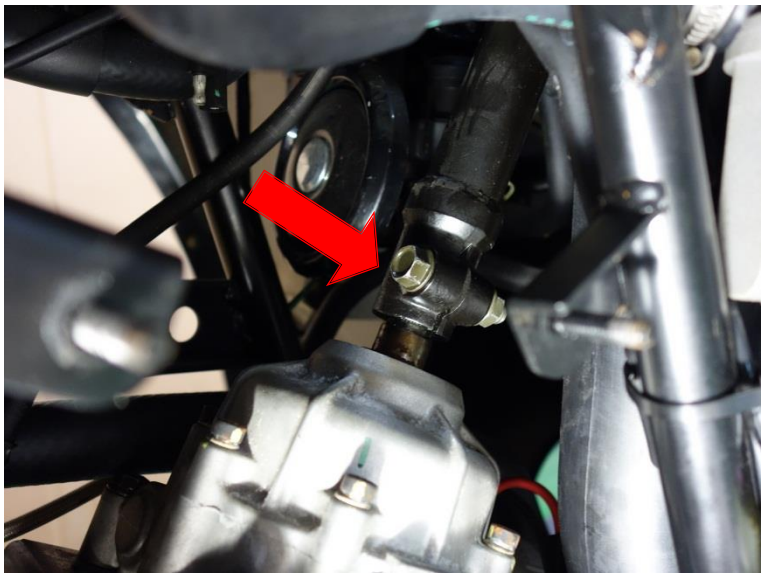
Remove the steering shaft bushing cap.

Remove both wheel

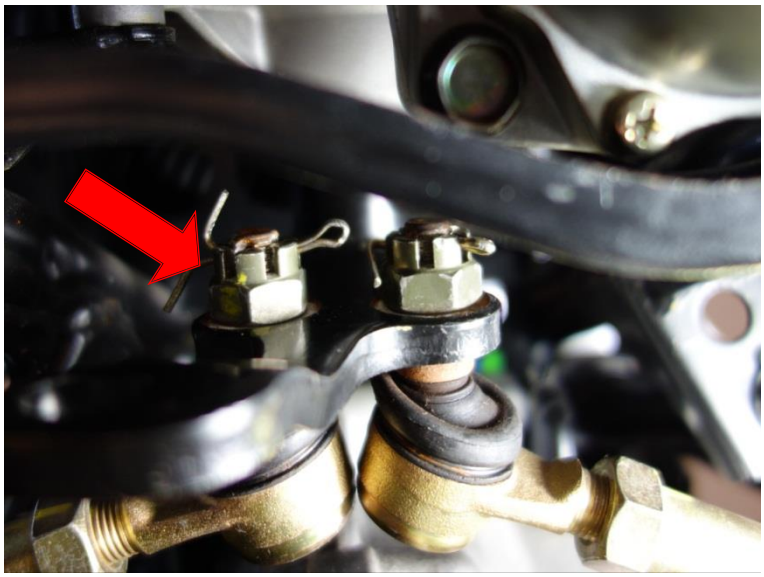
Remove both side inner fender trim clips and front shcok absorber mounting nuts and bolts



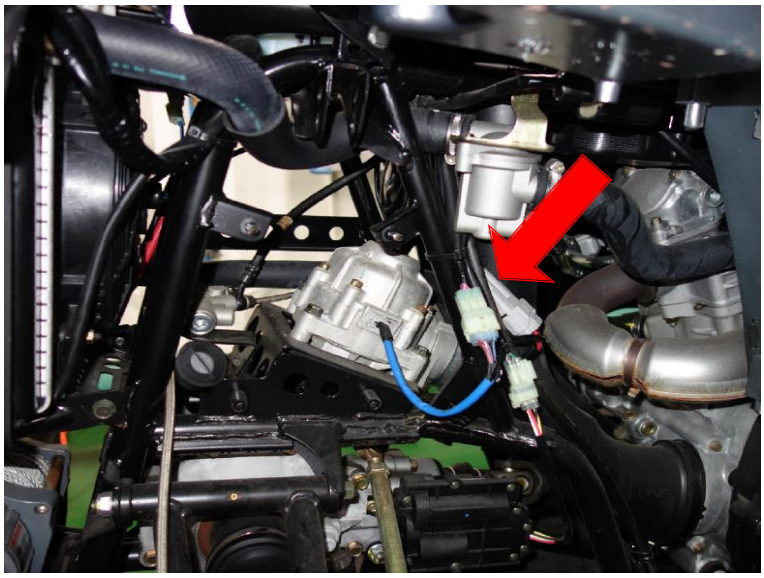
Remove the EPS MCU unit mounting bolts and nuts



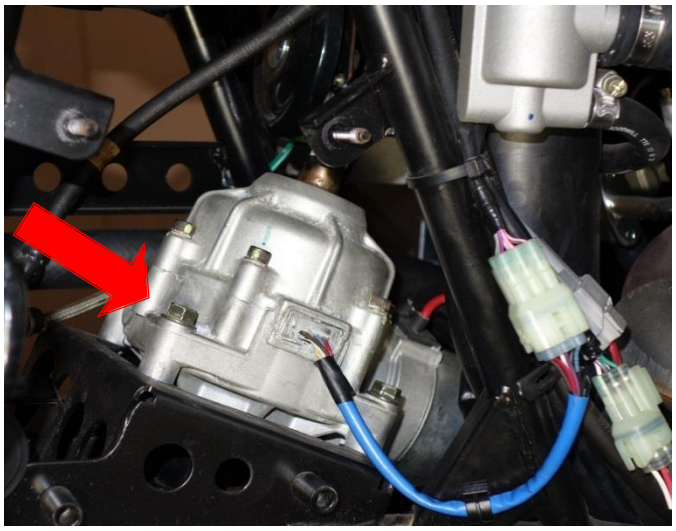
Remove the bolt retaining the steering post to the power steering unit. Then lift the upper steering post up from the power steering unit.



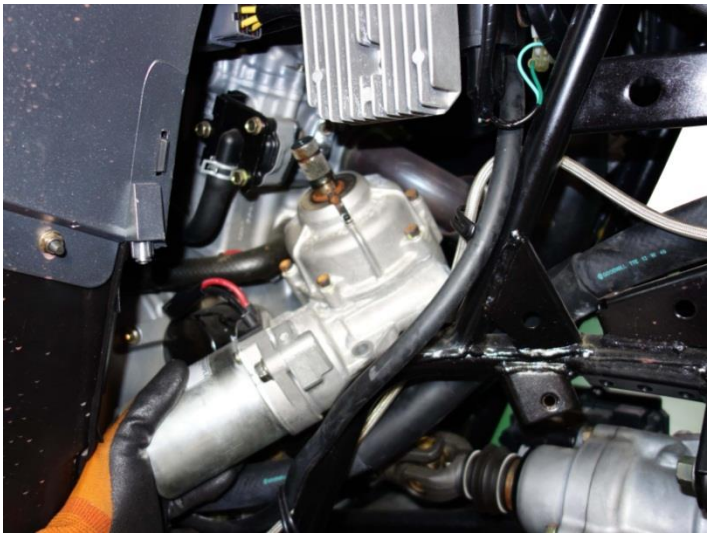
Free the inner ends of the tie-rods from the power steering unit.



Disconnect the electrical harness from the power steering unit.



Remove the (4) mounting fasteners that retain the power steering unit to the frame.



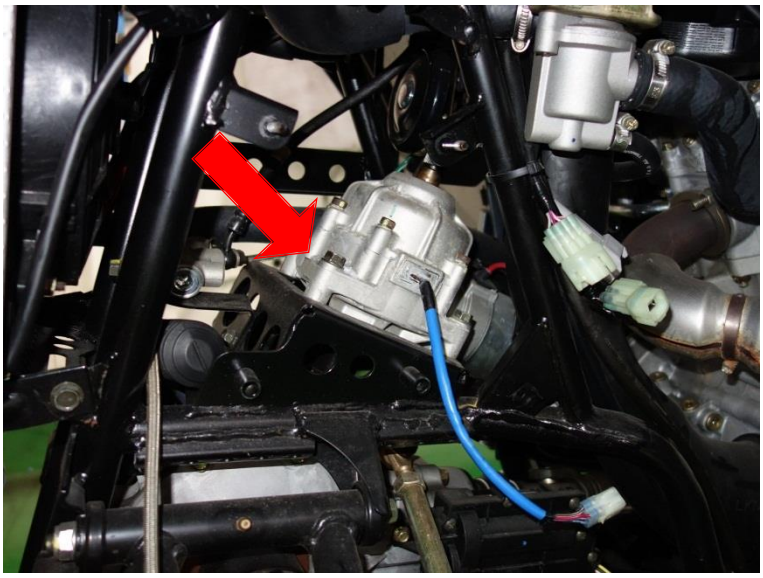
Take out the power steering unit through the front right wheel area.

Carefully lift the power steering unit up to disengage the lower steering coupler and remove it from the chassis.

⚠CAUTION
Striking the steering post can permanently damage the EPS unit and cause a Power Steering Fault.

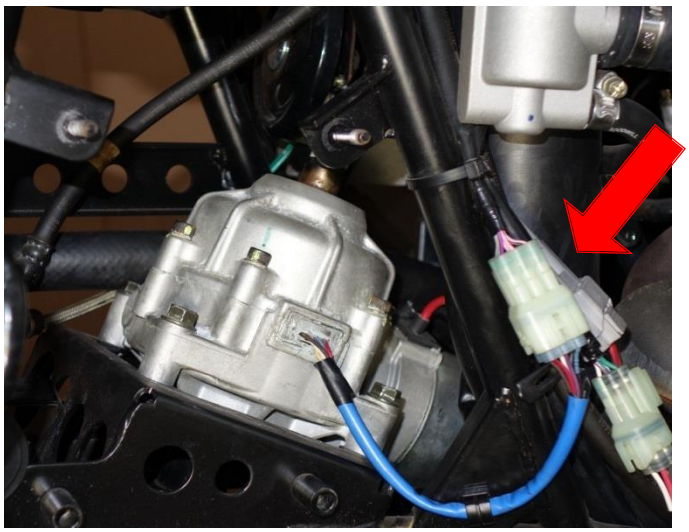
EPS Installation

Position the vehicle so the front wheels are pointing straight forward.
Clean the steering post so the alignment mark is visible. Mark the skip tooth spline on the power steering shaft

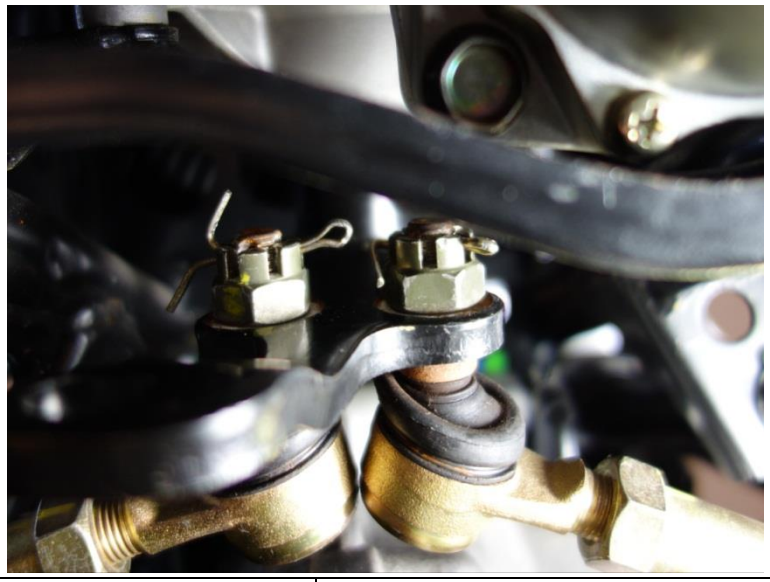


No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	M8x1.25	2.4~3.0	24~30	17.4~21.7

Align mounting holes and install the power steering unit. Install the (4) mounting bolts and torque bolts to specification.

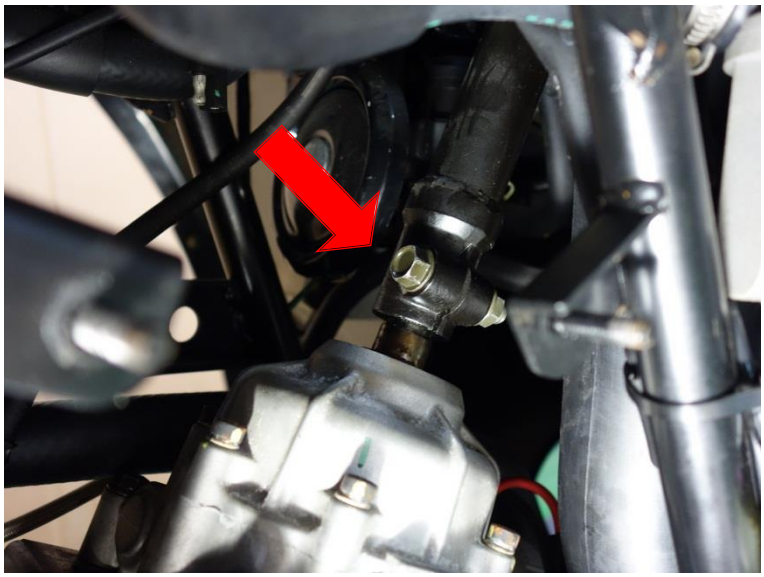


Reconnect the (3) electrical harnesses to the power steering unit.



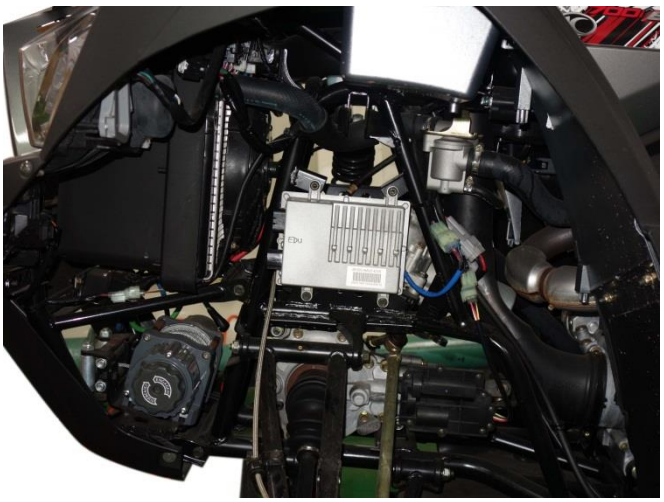
No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	M10x1.25	3.5~4.8	35~48	25.3~34.7

Reinstall the inner ends of the tie-rods with the power steering unit.



No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	M8x1.25	1.5~2.5	15~25	10.8~18.1

Align the mark on the steering post with the skip tooth spline on the power steering shaft upon installation. Apply anti-seize to the shaft splines to aid assembly.



No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	Bolt	0.8~1.2	8~12	5.8~8.7
2	Nut	0.8~1.2	8~12	5.8~8.7

Install the EPS MCU unit mounting bolts and nuts

No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	M10x1.25	4.1~5.6	41~56	29.7~40.5

Install both side inner fender trim clips and front shcok absorber mounting nuts and bolts

No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	M10x1.25	5.6~6.5	56~65	40.5~47

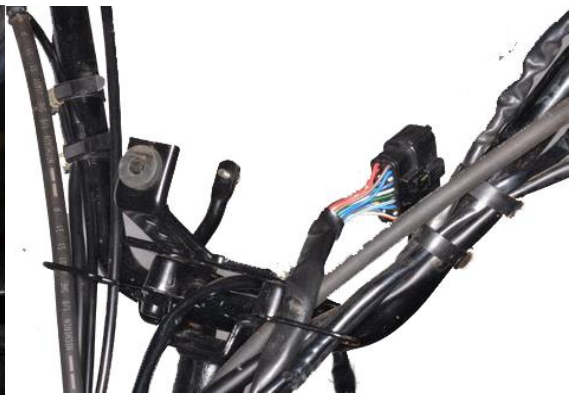
Reinstall both wheel

No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	Bolt (M8x1.25) x2	2.4~3.2	24~32	17.4~23.1

Install the steering post bushing bracket and torque the (2) fasteners to specification.

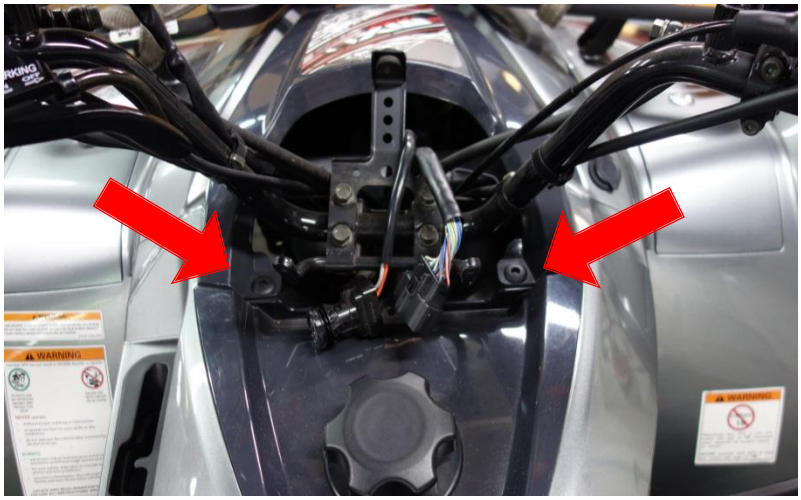
No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	Bolt(M8x1.25) x 4	2.4~3.0	24~30	17.4~21.7

Install the four handle clamp bolts and make sure the handlebar is positioned so that the punch mark lines up a show.



Fit and route the wires, throttle cable and brake hoses as show.

Turn the ignition key to the “ON” position and move the handlebar from left to right several times to ensure the power steering doesn’t bind.



Install front cover with trim clips.

Install the ignition switch

Plug the connector from the back of the instrument display.

Slide the instrument cover backward and install it with the rubber grommet.Then installation the two screws with a #2 Phillips screwdriver.

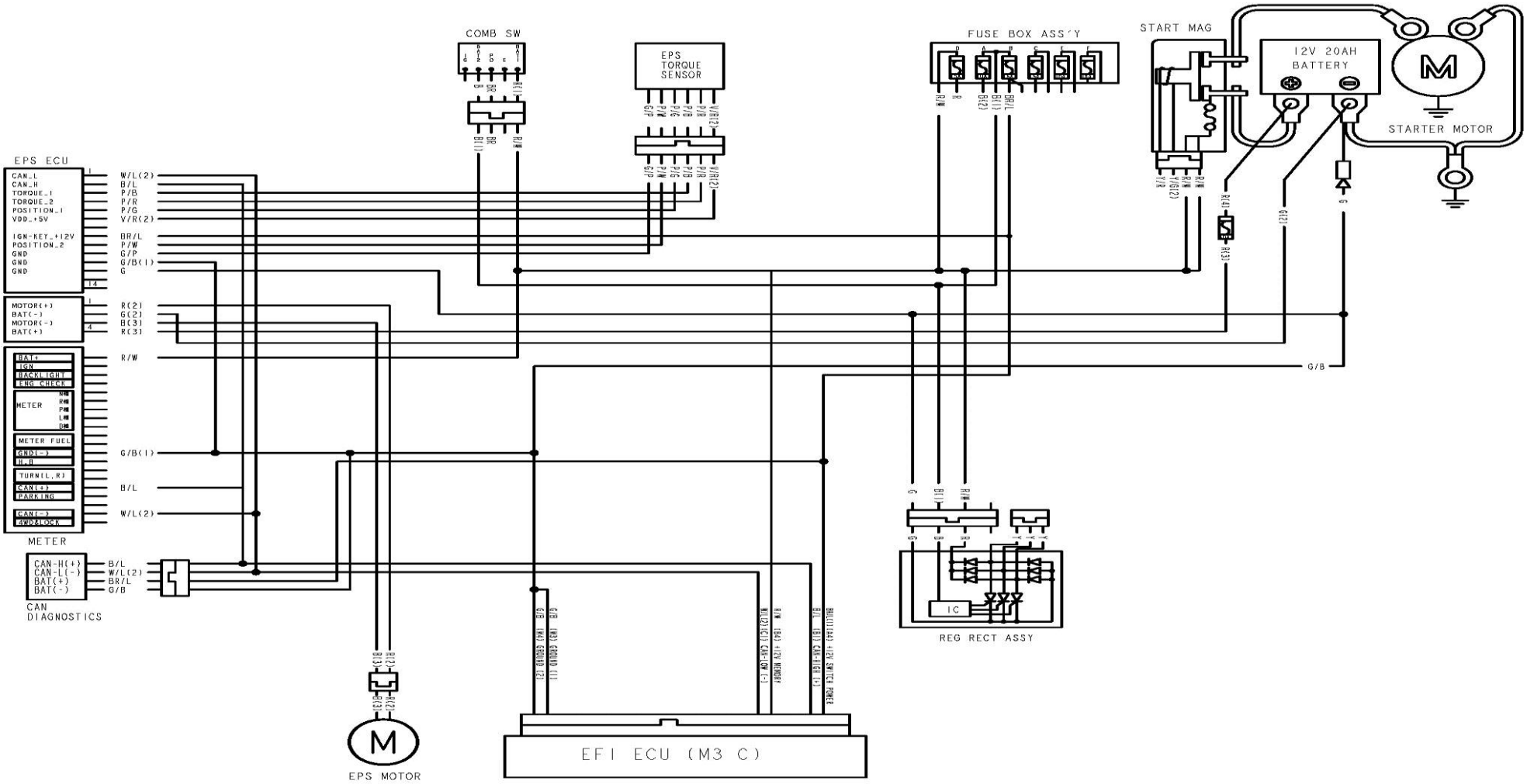
No.	Item	Torque		
		kgf.m	N.m	ft.lb
1	M5x0.8	0.35~0.5	3.5~5	2.5~3.6

Symptom Troubleshooting

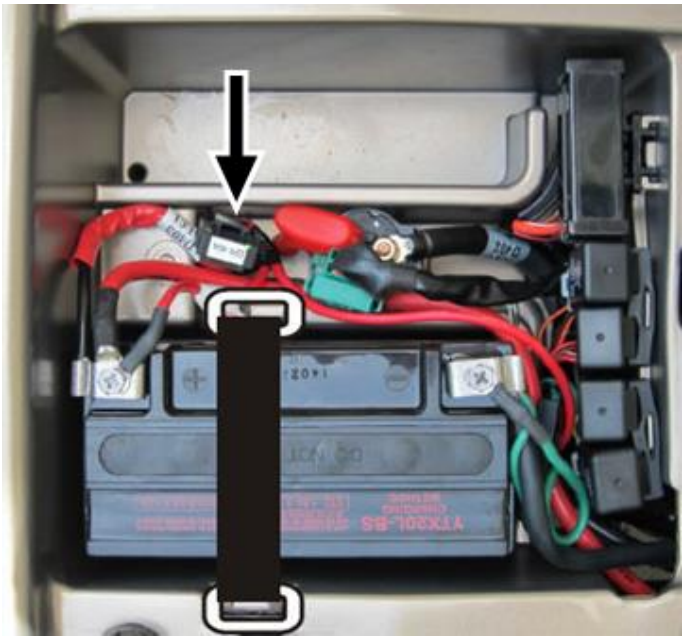
EPS indicate light go on, and diagnostic procedure

DTC	Hint	Inspection	Detection Condition	Action
Ox232	Byte [0]	Torque sensor	Sensor malfuntion	Check voltage:2.5±0.1V (at neutral position setting)Replace EPS unit
	Byte [1]	Speed sendor	disable	
	Byte [2]	Battery	Battery over the normal range (9~16V)	Check battery voltage or charging system
	Byte [3]	Current sensor	Can not detect current	Replace EPS MCU unit
	Byte [4]	MCU	MCU malfuntion	Replace EPS MCU unit
	Byte [5]	Motor	EPS motor malfuntion	Replace EPS motor
	Byte [6]	MCU Relay	MCU relay malfuntion	Replace EPS MCU unit
	Byte [7]	Motor driver	MCU motor control modular malfuntion	Replace EPS MCU unit

EPS Circuit Diagram (Only EPS Model)



There is 40 A fuse for the power steering system in the battery box. If the fuse is blown, steering becomes heavy. Replace the blown fuse with a fuse of the same specific amperage and type.

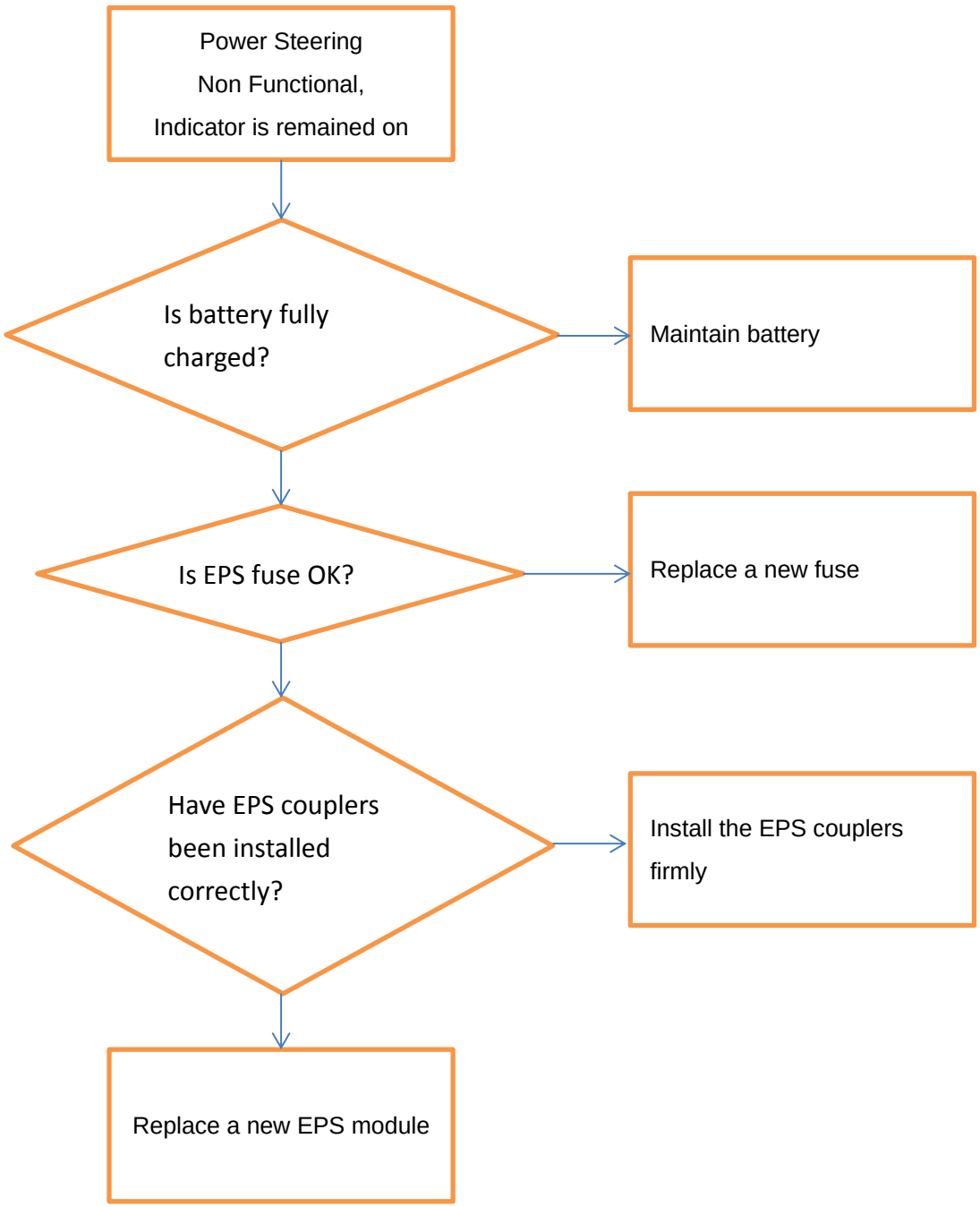


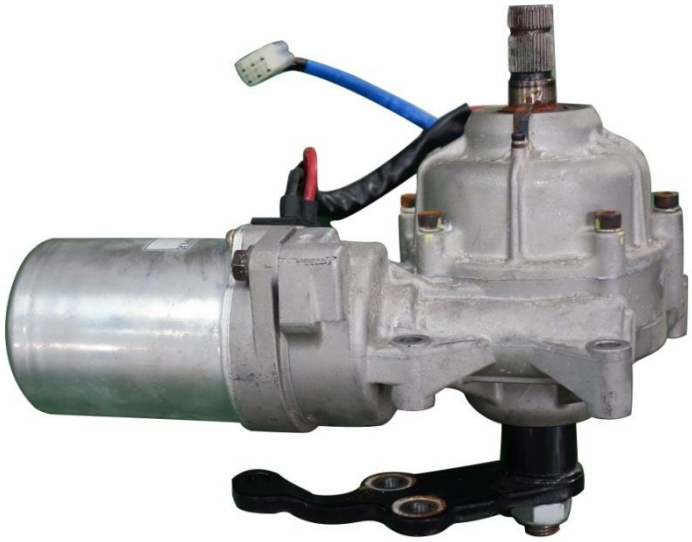
40A of fuse

NOTE:

The electrical system can produce electrical shocks. When replacing the 40 A fuse, first remove the cables from the battery terminals to avoid electric shock.

EPS Troubleshooting for user





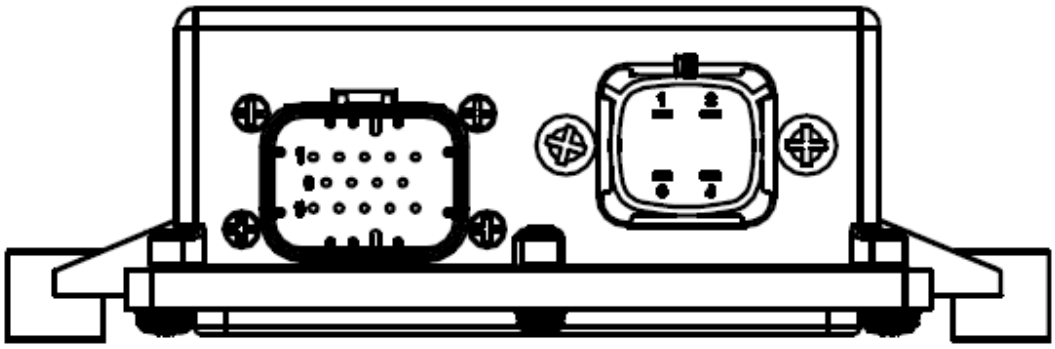
NOTE:

The EPS module is not maintainable, when the EPS problem occurs, check the battery voltage, fuse and the couplers. If the problem remained, replace the EPS whole module. Do not try to dismantle the components of the EPS module for repair.

EPS Troubleshooting for dealar

Terminal Table:

EPS control module wiring harness side



Pin ID

1	**2**	**3**	**4**	**5**
6	**7**	**8**	**9**	
10	**11**	**12**	**13**	**14**

Signal name

CAN_L	CAN_H	TORQUE_1	TORQUE_2	POSITION_1
VDD_5V	NC	IGN_KEY	POSITION_2	
GROUND	GND	GND	NC	NC

Pin ID for EPS motor and power

1	**2**
3	**4**

EPS motor connector signal name

MOTOR_Voltage (+)	Battery_Voltage (-)
MOTOR_Voltage (-)	Battery_Voltage (+)

Verify the symptom, and perform troubleshooting according to the appropriate number.

No.	Symptom
1	EPS waring light does not illuminate with ignition switch at on
2	EPS waring light does not go out even through engine has started

No.	Symptom
1	EPS waring light does not illuminate with ignition switch at on
Troubleshooting hints ● EPS waring light circuit malfunction in the instrument . ● An error originates from the EPS control module. ■ EPS control module malfunction	

Step	Inspection		EPS waring light does not illuminate with ignition switch at on
1	Inspect Pin ID/ Data in EPS control module: ~Is the EPS lamp on while the ignition switch is turned to the on position?	Yes	EPS warning light circuit malfunction in the instrument.
		No	EPS control module malfunction. Replace the EPS control module

No.	Symptom
2	EPS waring light does not go out even through engine has started

Troubleshooting hints

- EPS system malfunction
  - Wiring harness malfunction
  - Connector condition malfunction
  - Torque sensor malfunction
  - EPS motor malfunction
  - Fuse malfunction
  - EPS control module malfunction
- EPS control module detects an EPS system malfunction even though the EPS system is normal.
- Can communication line malfunction
  - Vehicle speed signal malfunction
  - Engine speed signal malfunction
  - CAN wiring harness malfunction
- EPS warning light circuit malfunction in the instrument
- Can wiring harness malfunction
  - Malfunction in wiring harness between EPS control module and instrument

13.Rear Suspension

This chapter provides the rear suspension specifications for the KYMCO MXU 700i and MXU 500i models.

Shock Absorbers 13-2
Suspension Arms 13-6

TROUBLESHOOTING

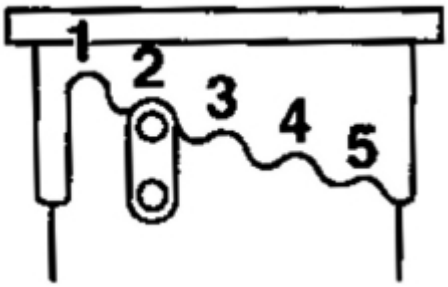
Soft rear shock absorber

• Weak shock absorber spring
• Faulty damper

Rear Shock Absorbers

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Preload



The shock absorbers have adjustable preload collars.

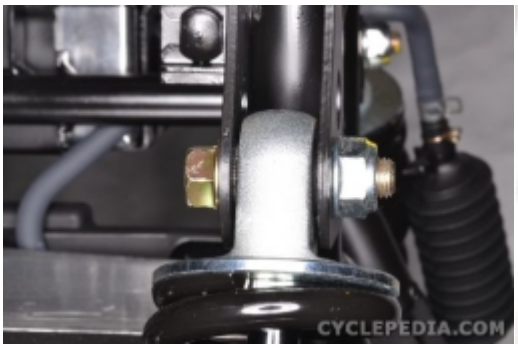
Turn the preload collar with a pin spanner to adjust the spring preload.

Increase the amount of preload for heavy loads.

Removal

Support the back of the frame so that the vehicles weight is not resting on the rear suspension.
Remove the rear wheels. See the Wheels and Wheel Hubs topic for more information.

The rear shock absorbers are mounted to the frame and the lower suspension arms.



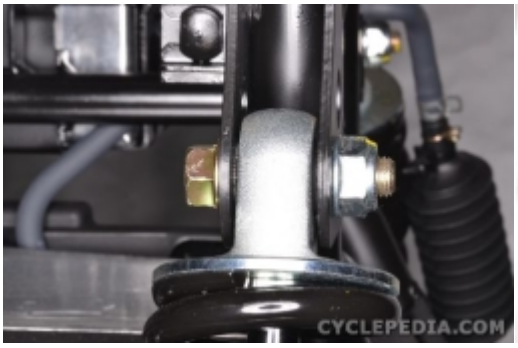
Hold the rear shock absorber mounting bolts with a 14 mm socket and loosen the nuts with a 17 mm socket. Remove the upper and lower shock absorber mounting nuts and bolts.
Remove the shock absorber.

Inspection

Inspect the shock absorber for damage and leaks. Replace as needed.

Installation

Use new locknuts with the suspension pivot bolts.



Install the shock absorber. Insert the rear shock absorber mounting bolts from the front. Thread on the nuts.

Hold the shock absorber mounting bolts with a 14 mm socket and tighten the nuts to specification with a 17 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
REAR SHOCK UPPER JOINT AND FRAME	M10 X1.25	4.8	48	35
REAR SHOCK JOINT AND REAR LOWER ARM	M10 X1.25	4.8	48	35

Install the rear wheels. See the Wheels and Wheel Hubs topic for more information.

Rear Suspension Arms

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Removal

Support the back of the frame so that the vehicle weight is not resting on the rear suspension.

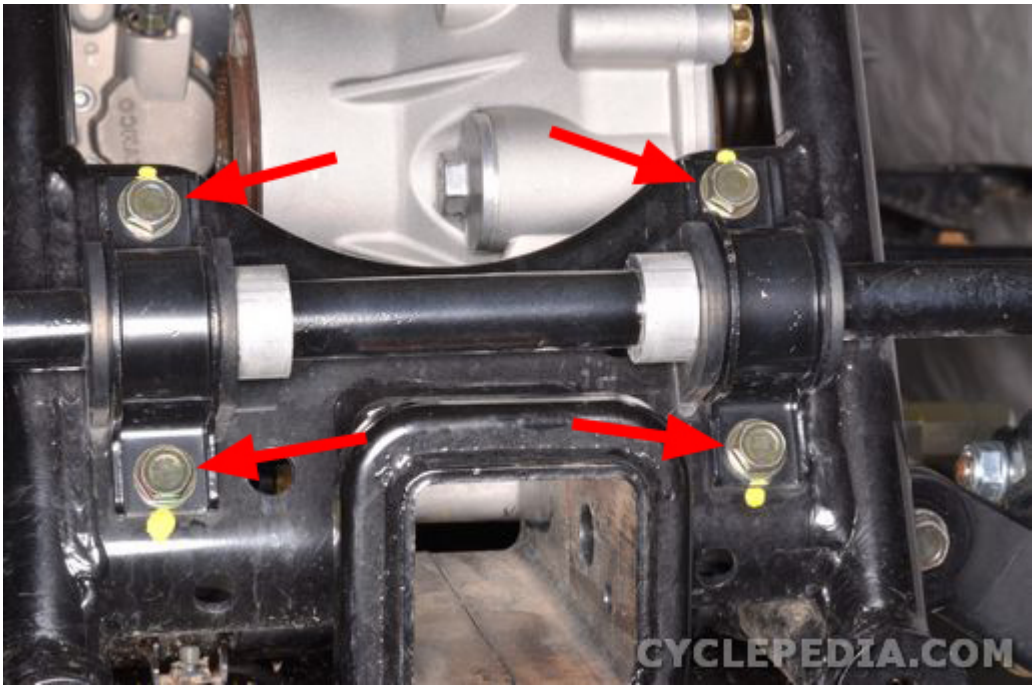
Remove the rear wheels and hubs. See the Wheels and Wheel Hubs topic for more information.

Remove the shock absorbers. See the Rear Shock Absorbers topic for more information.

Tie-Rods and Stabilizer Bar

The stabilizer bar tie-rods connect the stabilizer bar to the upper rear suspension arms.
Hold the tie-rod joints with a 12 mm socket and loosen the nuts with a 17 mm socket.

Remove the tie-rods. Note their locations so they can be returned to their original positions.



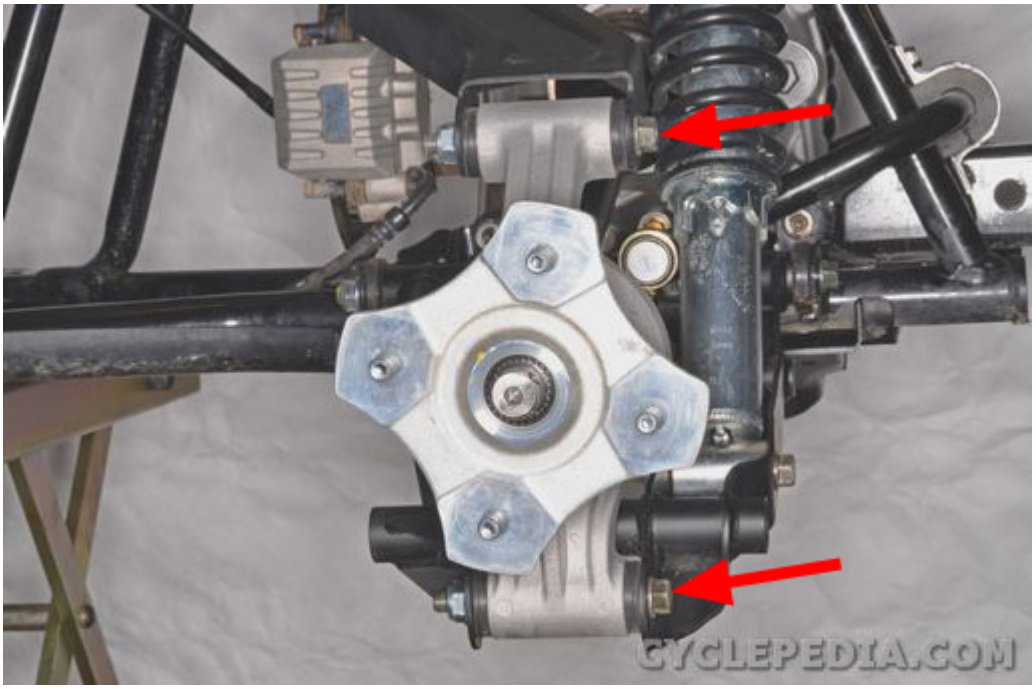
Remove the two bolts for each stabilizer bushing mount. Remove the stabilizer bar and bushings.

Insect the tie rod ball joints and boots for wear and damage. Move the ball joint by hand and make sure it moves smoothly. Replace the stabilizer ball joint as needed.

Inspect the stabilizer bar and bushings. Replace the components as needed.

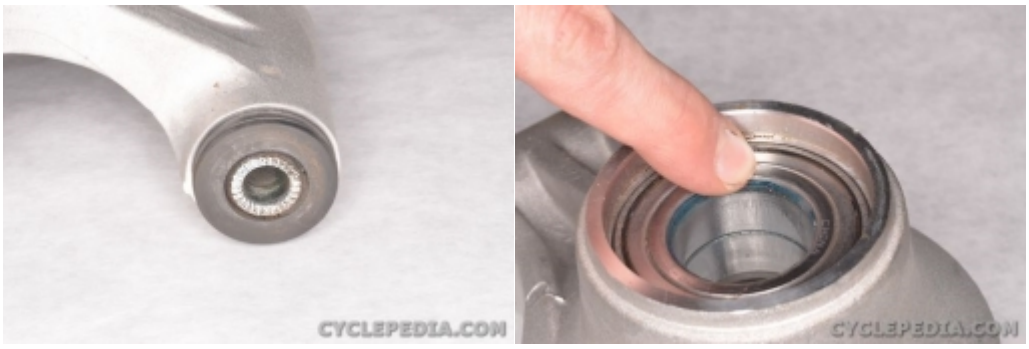
Rear Knuckles

Remove the rear brake caliper. See the Rear Brake Caliper topic for more information.



The rear knuckles mount to the A-arms with a nut and bolt at the top and bottom. Hold the rear knuckle arm bolts with a 14 mm wrench and loosen the nuts with a 17 mm socket. Remove the rear knuckle nuts and bolts.

Free the rear knuckle from the rear arms and the half shaft.

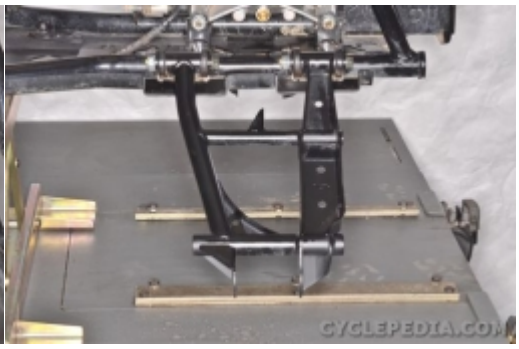


Inspect the knuckle and bearing.

Knuckle Bearing Replacement

To replace the bearings, see the Wheel Bearings topic for more information.

Rear Suspension Arms



Move the suspension arms up and down. Also, try to move them front to back. If there is excessive play, the bushings may need to be replaced.

The lower suspension arms are each held to the frame with two pivot bolts and nuts. The upper suspension arms have one pivot bolt and nut each.

Hold the bolts with a 14 mm socket and loosen the nuts with a 17 mm socket.

Remove the pivot bolts and nuts. Remove both suspension arms in the same manner.

Inspect suspension arms for signs of damage.

Remove the dust seals and collars.

Inspect the bushings and collars.

Replace the bushings as needed. Replace the bushings in the same manner as the front A-arms. See the A-arms topic for more information.

Installation

Use new locknuts with the suspension pivot bolts.

Rear Suspension Arms

Install the pivot collars and dust seals.

Fit the rear suspension arms into place.

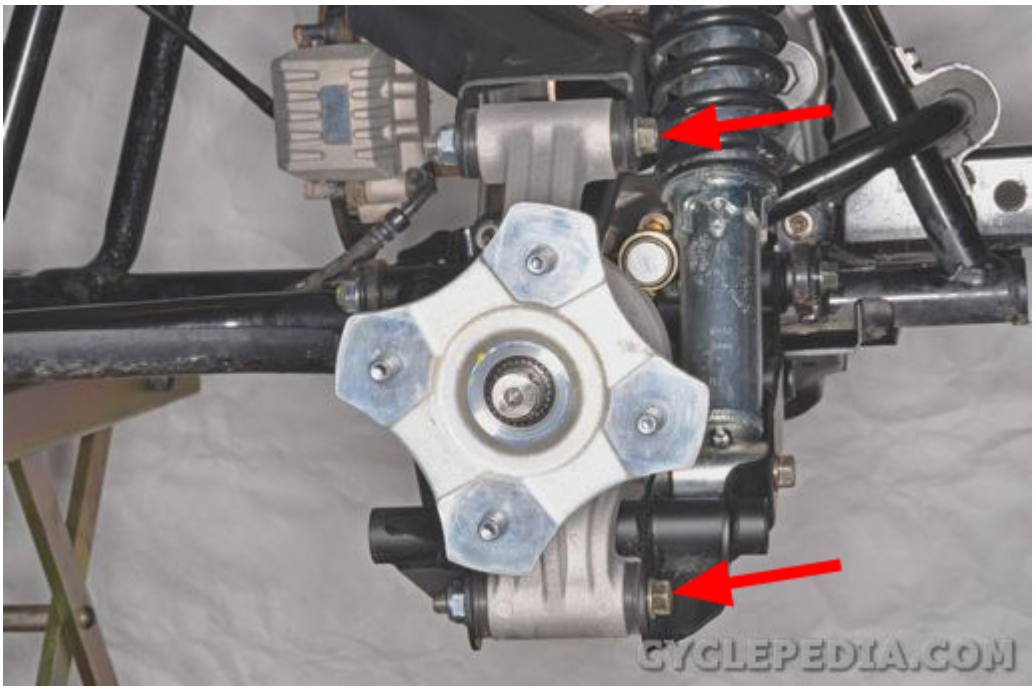
Install all of the pivot bolts from the front and thread on the nuts.

Hold the bolts with a 14 mm socket and tighten the nuts to specification with a 17 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
REAR UPPER/LOWER ARM AND FRAME	M10 X1.25	4.8	48	35

Rear Knuckles

Grease the drive shaft splines. Fit the knuckle into place in its original position. Guide the half shaft through the bearing in the knuckle.

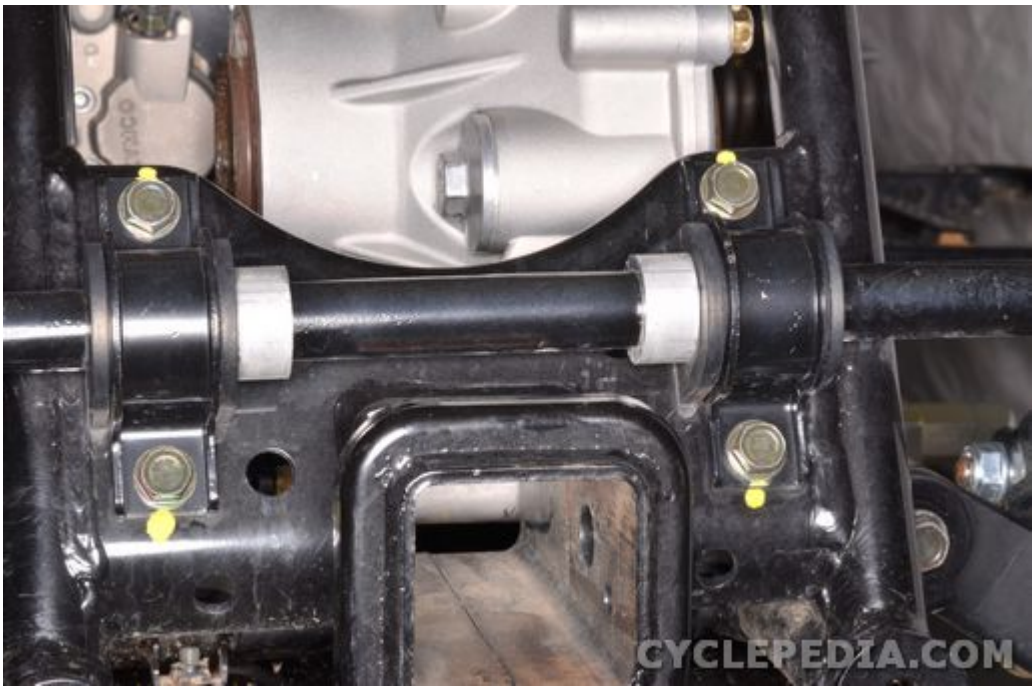


Insert the rear knuckle bolts from the front and thread on the nuts. Hold the bolts with a 14 mm wrench and tighten the nuts to specification with a 17 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		kgf-m	Nm	ft-lb
REAR KNUCKLE AND REAR UPPER/LOVER ARM	M10 X1.25	4.8	48	35

Stabilizer Bar / Sway Bar

Fit the stabilizer bar and bushings into place.



Install the two bolts for each stabilizer bushing mount.

ITEM	N-m	kgf-m	ft-lb
Stabilizer and frame	27	2.7	19

Fit the stabilizer tie-rods into place in their original positions.

Thread on new tie-rod nuts.

Hold the tie-rod joints with a 12 mm socket and tighten the nuts to specification with a 17 mm socket.

ITEM	N-m	kgf-m	ft-lb
Stabilizer tie-rod joint nut	55	5.5	40

Install the shock absorbers. See the Rear Shock Absorbers topic for more information.

Install the rear wheels. See the Wheels and Wheel Hubs topic for more information.

14.Electrical Systems

This chapter covers the location and servicing of the electrical systems for the KYMCO MXU 700i and MXU 500i models.

1.Electrical Specifications 14-19
2.Battery 14-21
3.Charging System 14-26
4.Fuses 14-40
5.Ignition System 14-46
6.Lights 14-64
7.Starter Motor 14-72
8.Starting System 14-78
9.Switches 14-87
10.Wiring Diagrams 14-101

CHARGING SYSTEM AND BATTERY

CAUTION

• The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.

• The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
—If electrolyte gets on your skin, flush with water.
—If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.

• Electrolyte is poisonous.

— If swallowed, drink large quantities of water or milk and call your local Poison Control Center or physician immediately, KEEP OUT OF REACH OF CHILDREN.

GENERAL INSTRUCTIONS

• Always turn off the ignition switch before disconnecting any electrical component.

• Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is tinned to "ON" and current is present.

• For extended storage, remove the battery. give it a full charge, and store it in a cool, dry place.

• For a battery remaining in a shorted vehicle, disconnect the negative battery cable from the battery.

• The battery caps should not be removed. Attempting to remove the sealing caps from the cells may damage the battery.

• The maintenance free battery must be replaced when it reaches the end of its service life.

• The battery can be damaged if overcharged or undercharged, or if left to discharge for long period. These same conditions contribute to shortening the "life span" of the battery. Even under normal use. the performance of the battery deteriorates after 2-3 years.

• Battery voltage may recover after battery charging, but under heavy load, the battery voltage will drop quickly and eventually die out. For this reason, the charging system is often suspected as the problem. Battery overcharge often results from problems in the battery itself, which may appear to be an overcharging symptom. If one of the battery cells is shorted and battery

voltage does not increase, the regulator/rectifier supplies excess voltage to the battery. Under these conditions, the
electrolyte level goes down quickly.

• Before troubleshooting the charging system, check for proper use and maintenance of the battery. Check if the battery is frequently under heavy load, such as having the headlight and taillight on for long periods of time without riding the vehicle.

• The battery self-discharge when the vehicle is not in use. for this reason, charge the battery every 2 weeks to prevent sulfate from occurring.

• Filling a new battery with electrolyte will produce some voltage, but in order to achieve its maximum performance, always charge the battery. Also, the battery life is lengthened when it is initially charged.

• When checking the charging system, always follow the steps in the troubleshooting flow chart.

TROUBLESHOOTING

Problem: Magneto does not charge	
Condition	Remedy
1. Lead wires/connections shorted - loose - open	1. Repair - replace - tighten lead wires
2. Magneto coils shorted - grounded - open	2. Replace magneto coils
3. Regulator/rectifier defective	3. Replace regulator/rectifier
Problem: Magneto charges, but charging rate is below the specification	
Condition	Remedy
1. Lead wires shorted - open - loose (at terminals)	1. Repair - tighten lead wires
2. Stator coils (magneto) grounded - open	2. Replace stator coils
3. Regulator/rectifier defective	3. Replace regulator/rectifier
4. Battery voltage low	4. Recharging battery
5. Cell plates (battery) defective	5. Replace battery

Problem: Magneto overcharges	
Condition	Remedy
1. internal battery short circuited	1. Replace battery
2. Regulator/rectifier damaged - defective	2. Replace regulator/rectifier
3. Regulator/rectifier poorly grounded	3. Clean - tighten ground connection
Problem: Charging unstable	
Condition	Remedy
1. Lead wire intermittently shorting	1. Replace lead wire
2. Magneto internally shorted	2. Replace magneto
3. Regulator/rectifier defective	3. Replace regulator/rectifier

BATTERY CHARGING

• This model comes with a maintenance free (MF) battery. Remember the following about MF batteries.
— Use only the electrolyte that comes with the battery.
— Use all of the electrolyte
— Seal the battery properly
— Never open the seals again

• For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.

IGNITION SYSTEM

GENERAL INSTRUCTIONS

• Some electrical components may be damaged if terminals or connectors are connected or disconnected while the ignition switch is “ON” and current is present.

• The ignition timing cannot be adjusted since the ignition control module is already adjusted in factory.

• The ignition control module or ECU maybe damaged if dropped or the connector is disconnected when the key is "ON", the excessive voltage may damage the ignition control module or ECU. Always turn off the ignition switch before servicing.

• A faulty ignition system is often related to poor connections. Check those connections before proceeding.

• Make sure the battery is adequately charged. Using the starter motor with weak battery results in a slower engine cranking speed as well as no spark at the spark plug.

• Use a spark plug of the correct heat range. Using spark plug with an incorrect heat range can damage the engine.

TROUBLESHOOTING

Low peak voltage

• Cranking speed is too low (battery is undercharged).
• Poorly connected connectors or an open circuit in the ignition system.
• Faulty ignition-coil.
• Faulty ignition control module.

No peak voltage

• Short circuit in engine stop switch or ignition switch wire.
• Faulty engine stop switch or ignition switch.
• Loose or poorly connected ignition control module connectors.
• Open circuit or poor connection in ground wire of the ignition control module.
• Faulty ignition pulse generator/crank position sensor.
• Faulty ignition control module.

Peak voltage is normal, but no spark jumps at the plug

• Faulty spark plug or leaking ignition coil secondary current.
• Faulty ignition coil.

Starting System

GENERAL INSTRUCTIONS

• Always turn the ignition switch to "OFF" before servicing the starter motor. The motor could suddenly start, causing serious injury.

• The starter motor can be serviced with the engine in the frame.

• When checking the starter system, always follow the steps in the troubleshooting flow chart.

• A weak battery may be unable to turn the starter motor quickly enough, or supply adequate ignition current.

• If the current is kept flowing through the starter motor to turn it while the engine is not cranking over, the starter motor may be damaged.

TROUBLESHOOTING

Starter motor will not turn

• Fuse burned out
• Weak battery
• Faulty ignition switch
• Faulty starter clutch or gear
• Faulty starter relay

• Poorly connected, broken or shorted wire
• Faulty starter motor

Lack of power

• Weak battery
• Loosed wire or connection
• Foreign matter stuck in starter motor

Starter motor rotates but engine does not start

• Faulty starter pinion
• Starter motor rotates in reverse
• Weak battery

LIGHTS, SWITCHES, AND FUEL PUMP

GENERAL INSTRUCTIONS

• Note the following when replacing the halogen headlight bulb

1. Wear clean gloves while replacing the bulb. Do not put finger prints on the headlight bulb, as they may create hot spots on the bulb and cause it to fail.
2. If you touch the bulb with your bare hands, clean it with a cloth moistened with alcohol to prevent its early failure.
3. Be sure to install the dust cover after replacing the bulb.

• Check the battery condition before performing any inspection that requires proper battery voltage.

• A continuity test can be made with the switches installed on the scooter.

• Route the wires and cables properly after servicing each component.

TROUBLESHOOTING

Lights do not come on when ignition switch is “ON”
• Burned bulb
• Faulty switch
• Poorly connected, broken or shorted wire

Temperature gauge does not register correctly

• Faulty temperature gauge
• Faulty thermosensor
• Broken or shorted wire between the temperature gauge and thermosensor

Fuel gauge does not work or shows wrong figures

• Faulty fuel gauge
• Faulty fuel unit
• Poorly connected wire between fuel gauge and fuel unit
• Fuse burned out

Specifications

General Specifications

Model No. MXU 500i		LDA0CA
Model No. MXU 700i		LAADAA(US)
Overall length		2210 mm
Overall width		1220 mm
Overall height		1265 mm
Wheel base		1297 mm
Engine type		4 stroke D.O.H.C.
Displacement	MXU 500i	498.5 cc
	MXU 700i	694.6 cc
Fuel used		92# nonleaded gasoline
Dry weight	Front wheel	170 kg
	Rear wheel	159 kg
	Total	329 kg
Curb weight	Front wheel	178 kg
	Rear wheel	169 kg
	Total	349 kg
Tires (standard models)	Front wheel	AT25 X 8-12
	Rear wheel	AT25 X 10-12
Ground clearance		265 mm
Min. turning radius		3450 mm

Tires (LE models)	Front wheel	AT 26 X 9-14
	Rear wheel	AT 26 X 11-14

Starting system	Electric

Type		Gasoline, 4-stroke
Cylinder arrangement		Single cylinder
Combustion chamber type		Semi-sphere
Valve arrangement	MXU 500i	DOHC, chain drive
	MXU 700i	SOHC, chain drive
Bore x stroke	MXU 500i	92 X 75 mm
	MXU 700i	102 X 85 mm
Compression ratio		10.5:1
Compression pressure		15 kg/cm^2 (213 psi)
Intake valve (at 1mm lift) MXU 500i	Opens	-1° BTDC
	Closes	48° ABDC
Exhaust valve (at 1mm lift) MXU 500i	Opens	45° BBDC
	Closes	5° ATDC
Intake valve (at 1mm lift) MXU 700i	Opens	-5° BTDC
	Closes	54° ABDC
Exhaust valve (at 1mm lift) MXU 700i	Opens	50° BBDC
	Closes	3° ATDC
Valve clearance (cold)	Intake	0.1 mm
	Exhaust	0.1 mm
Idle speed (rpm)	MXU 500i	1400 ± 100 rpm
	MXU 700i	1500 ± 100 rpm
Cooling type		Liquid cooled

Lubrication type	Forced pressure & Wet sump
Oil pump type	Trochoid
Oil filter type	Full-flow filtration
Oil capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)
Air cleaner type & No	Wet type element
Fuel capacity	16.5 L

Throttle body	TYPE	KYMCO PTA1
	VENTURE DIA	38 mm
Ignition System	Type	Full transistor digital ignition
	Ignition timing	5° at idle rpm (MXU 500i) 10° at idle rpm (MXU 700i)
	Spark plug	CR7E (NGK)
	Spark plug gap	0.6~0.7 mm
Battery	Capacity	12V18AH

Clutch type		Wet, centrifugal automatic
Clutch operation system		Automatic (V-belt)
Primary reduction system		V-belt
Secondary reduction system		Shaft drive
Forward drive high radio		8.770~30.067
Forward drive low radio		16.279~55.814
Reverse drive ratio		13.381~45.878
FR/RR tire rolling circumference		1995/1995
Tire pressure	Front (standard)	0.35 kgf/cm^2 (35 Kpa, 5.0 psi)
	Rear (standard)	0.32 kgf/cm^2 (32Kpa, 4.5 psi)
	Front (LE)	0.7 kgf/cm^2 (70 Kpa, 10 psi)
	Rear (LE)	0.97 kgf/cm^2 (97 Kpa, 14 psi)
Turning angle	Left	41°
	Right	41°

Brake system type	Front	Disk brake
	Rear	Disk brake
Suspension type	Front	Dual A-Arm
	Rear	Dual A-Arm

Lubrication Specifications

ITEM		STANDARD	SERVICE LIMIT
Recommended engine oil		KYMCO 4-stroke oil or equivalent motor oil API service classification SJ Viscosity: SAE 5W-50	—
Oil pump rotor	Tip clearance	0.15 max	0.2
	Body clearance	0.15 - 0.2	0.25
	Side clearance	0.04 - 0.09	0.12

Lubrication type	Forced pressure & Wet sump
Oil pump type	Trochoid
Oil filter type	Full-flow filtration
Oil capacity MXU 500i	3.6 L
Oil exchanging capacity MXU 500i	3.0 L
Oil capacity MXU 700i	2.4 L (oil change) 2.6 L (oil and filter change) 2.9 L (total)

Front gear box oil	
Recommended oil:	SAE 80
At disassembly:	270 cc
At change:	250 cc
Rear gear box oil	
Recommended oil:	SAE 80
At disassembly:	250 cc
At change:	230 cc

Fuel Injection Specifications

ITEM		SPECIFICATIONS
Throttle body identification number		PTA1
Throttle cable free play		3 ~ 5 mm
Fuel injector resistance (at 20°C/68°F)		10.6 - 15.9 Ω
Fuel pump resistance (at 20°C/68°F)	Float at full position	About 101 Ω
	Float at empty position	About 3 Ω
Fuel pump standard pressure (at 80 L/Hr)		300 ± 10 kPa (43.5 psi)
Water temperature sensor resistance	At -20°C/-4°F	28.6 KΩ
	At 40°C/104°F	1.46 KΩ/3.51 KΩ ±1 0%
	At 100°C/212°F	0.176 KΩ
T-MAP sensor resistance (20°C) (1 and 2 pins)		1613 - 2544 Ω
Inductive ignition coil		Primary: 0.55-0.75 Ω
Throttle position sensor (TPS) resistance (at 20°C/68°F)		3500-6500 Ω (1.2 pin)
Crank position sensor resistance		96 -144 Ω
Roll sensor voltage	Standard	0.4 -1.4 V
	Over 65° (fall down)	3.7- 4.4 V

Engine Specifications

MXU 500i Engine

Item		Standard mm (in)	Service Limit
Valve clearance (cold)	IN	0.1 mm (0.004 in)	-
	EX	0.1 mm (0.004 in)	-
Cylinder head compression pressure		15 kg/cm^2(1500 kPa, 213 psi)	-
Cylinder head warpage		-	0.05 (0.002)

Camshaft runout		-	0.05 (0.002)
Camshaft cam height	IN	37.2614 (1.4905)	37.11 (1.4844)
	EX	37.0084 (1.4803)	36.86(1.4744)
Valve rocker arm I.D.	IN	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)
	EX	10 - 10.015 (0.4 - 0.4006)	10.1 (0.404)
Valve rocker arm shaft O.D.	IN	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)
	EX	9.975 - 9.99 (0.399 - 0.3996)	9.9 (0.396)
Rocker arm to shaft clearance		0.009 - 0.042 (0.0004 - 0.0017)	0.1 (0.004)
Valve stem O.D.	IN	4.975 - 4.99 (0.199 - 0.1996)	4.925 (0.197)
	EX	4.955 - 4.97 (0.1982 - 0.1988)	4.915 (0.1966)
Valve guide I.D.	IN	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
	EX	5 - 5.015 (0.2 - 0.2006)	5.03 (0.2012)
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	0.08 (0.0032)
	EX	0.03 - 0.057 (0.0012 - 0.0023)	0.1 (0.004)

Item			Standard mm (in)	Service Limit
Cylinder	I.D.		92.005 - 92.015 (3.6802 - 3.6806)	92.1 (3.684)
	Warpage		0.01 (0.0004)	0.05 (0.002)
	Taper		0.01 (0.0004)	0.1 (0.004)
	Out-of-round		0.01 (0.0004)	0.1 (0.004)
Piston	Ring-to-groove clearance	top	0.03 - 0.065 (0.0012 - 0.0026)	0.08 (0.003)
		Second	0.015 - 0.05 (0.0006 - 0.002)	0.065 (0.0026)
	Ring end gap	top	0.15 - 0.3 (0.006 - 0.012)	0.5 (0.02)
		Second	0.03 - 0.45 (0.012 - 0.018)	0.65 (0.026)
		Oil side rail	0.2 - 0.7(0.008 - 0.028)	1 (0.04)
	Piston O.D.		91.96 - 91.98 (3.6784 - 3.6793)	91.9 (3.676)
	Piston O.D. measuring position		10 mm from bottom of skirt	-
	Piston-to-cylinder clearance		0.01 - 0.045 (0.0004 - 0.0018)	0.1 (0.004)
	Piston pin hole I.D.		22.002 - 22.008 (0.8801 -	22.04

		0.8803)	(0.8816)
Piston pin O.D.		21.994 - 22 (0.8798 - 0.88)	21.96 (0.8784)
Piston-to-piston pin clearance		0.002 - 0.014 (0.0001 - 0.0006)	0.02 (0.001)
Connecting rod small end I.D. bore		22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

Item	Standard mm (in)	Service Limit
Drive belt width	34.1 (1.364)	30.8 (1.232)
Clutch shoe thickness	1.5 (0.06)	1 (0.04)
Driven pulley spring	124.3 (4.972)	121.3 (4.852)
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)
	Connecting rod big end radial clearance		0 - 0.008 (0 - 0.00032)	0.05 (0.002)
	Runout		-	0.1 (0.004)

MXU700i Engine

Item		Standard mm (in)	Service Limit
Valve clearance (cold)	IN	0.1 mm (0.004 in)	-
	EX	0.18 mm (0.007 in)	-
Cylinder head compression pressure		15 kg/cm^2(1500 kPa, 213 psi)	-
Cylinder head warpage		-	0.05 (0.002)
Camshaft runout		-	0.05 (0.002)
Camshaft cam height	IN	37.9809 (1.4953)	-

	EX	37.3412 (1.4701)	-
Valve rocker arm I.D.	IN	12 - 12.018 (0.4724 - 0.4731)	-
	EX	12 - 12.018 (0.4724 - 0.4731)	-
Valve rocker arm shaft O.D.	IN	11.975 - 11.987 (0.471 - 0.4719)	-
	EX	11.975 - 11.987 (0.471 - 0.4719)	-
Rocker arm to shaft clearance		0.009 - 0.042 (0.0004 - 0.0017)	0.1 (0.004)
Valve stem O.D.	IN	5.975 - 5.99 (0.235 - 0.2358)	-
	EX	5.955 - 5.97 (0.2344 - 0.2350)	-
Valve guide I.D.	IN	6 - 6.012 (0.2362 - 0.2367)	-
	EX	6 - 6.012 (0.2362 - 0.2367)	-
Valve stem-to-guide clearance	IN	0.01 - 0.037 (0.004 - 0.0015)	-
	EX	0.03 - 0.057 (0.0012 - 0.0023)	-

Item		Standard
Valve Spring Free Length (IN and EX)	INNER	43 mm
	OUTER	37.5 mm

Item			Standard mm (in)	Service Limit
Cylinder	I.D.		102 - 102.01 (4.0158 - 4.0161)	102.1 (4.0197)
	Warpage		0.01 (0.0004)	0.05 (0.002)
	Taper		0.01 (0.0004)	0.1 (0.004)
	Out-of-round		0.01 (0.0004)	0.1 (0.004)
Piston	Ring-to-groove clearance	top	0.03 - 0.07 (0.0012 - 0.0028)	0.08 (0.003)
		Second	0.02 - 0.06 (0.0008 - 0.0024)	0.065 (0.0026)
	Ring end gap	top	0.25 - 0.35 (0.0098 - 0.0138)	0.5 (0.02)
		Second	0.7 - 0.9 (0.0276 - 0.0354)	-
		Oil side rail	0.2 - 0.7(0.008 - 0.028)	1 (0.04)
	Piston O.D.		101.975 - 101.985 (4.0148 - 4.0152)	-

	Piston O.D. measuring position	10 mm from bottom of skirt	-
	Piston-to-cylinder clearance	0.015 - 0.035 (0.0006 - 0.0014)	0.1 (0.004)
	Piston pin hole I.D.	23.006 - 23.012 (0.9057 - 0.9060)	23.04 (0.9071)
Piston pin O.D.		22.997 - 23 (0.9053 - 0.9055)	
Piston-to-piston pin clearance		0.006 - 0.015 (0.0002 - 0.0006)	0.02 (0.001)
Connecting rod small end I.D. bore		22.016 - 22.034 (0.8806 - 0.8814)	22.06 (0.8824)

Item	Standard mm (in)	Service Limit
Drive belt width	34.1 (1.364)	30.8 (1.232)
Clutch shoe thickness	1.5 (0.06)	1 (0.04)
Driven pulley spring	124.3 (4.972)	121.3 (4.852)
Weight roller O.D.	29.9 - 30.1 (1.196 - 1.204)	29.5 (1.18)

Item			Standard mm (in)	Service Limit
Crankshaft	Connecting rod big end side clearance	Not USA type	0.01 - 0.4 (0.002 - 0.016)	0.6 (0.024)
		USA type	0.3 - 0.6 (0.012 - 0.024)	0.8 (0.032)
	Connecting rod big end radial clearance		0 - 0.008 (0 - 0.00032)	0.05 (0.002)
	Runout		-	0.1 (0.004)

Cooling System Specifications

ITEM		SPECIFICATIONS
Coolant capacity	Radiator and engine	2.4 liter, 2.54 US qt. (MXU700i) 1.95 liter, 2.06 US qt. (MXU500i)
	Reserve tank	0.3 liter, 0.32 US qt.
Radiator cap relief pressure		90 kPa (0.9 kgf/cm^2, 12.8 psi)
Thermostat	Begin to open	69 - 73°C (156 - 163°F)
	Fully open	85°C (185°F)
	Valve lift	8 mm (0.3 in) minimum
Standard coolant concentration		1:1 mixture with soft water

COOLANT GRAVITY CHART											
	Temperature °C										
Coolant Concentration	0	5	10	15	20	25	30	35	40	45	50
5%	1.009	1.009	1.008	1.008	1.007	1.006	1.005	1.003	1.001	0.009	0.997
10%	1.018	1.107	1.017	1.016	1.015	1.014	0.013	1.011	1.009	1.007	1.005
15%	1.028	1.027	1.026	1.025	1.024	1.022	1.020	1.018	1.016	1.014	1.012
20%	1.036	1.035	1.034	1.033	1.031	1.029	1.027	1.025	1.023	1.021	1.019
25%	1.045	1.044	1.043	1.042	1.040	1.038	1.036	1.034	1.031	1.028	1.025
30%	1.053	1.051	1.051	1.049	1.047	1.045	1.043	1.041	1.038	1.035	1.032
35%	1.063	1.062	1.060	1.058	1.056	1.054	1.052	1.049	1.046	1.043	1.040
40%	1.072	1.070	1.068	1.066	1.064	1.062	1.059	1.056	1.053	1.050	1.047
45%	1.080	1.078	1.076	1.074	1.072	1.069	1.056	1.063	1.062	1.057	1.054
50%	1.086	1.084	1.082	1.080	1.077	1.074	1.071	1.068	1.065	1.062	1.059
55%	1.095	1.093	1.091	1.088	1.085	1.082	1.079	1.076	1.073	1.070	1.067
60%	1.100	1.098	1.095	1.092	1.089	1.086	1.083	1.080	1.077	1.074	1.071

Wheel and Brake Specifications

Item		Standard		Service Limit
Wheel rim run out	Radial	—		2 mm (0.08 in)
	Axial	—		2 mm (0.08 in)
Toe in		0~15 mm	(0~0.59 in)	—

Item	Standard mm (in)	Service Limit
Brake disk thickness	FR: 4.0 (0.156) RR: 5.0 (0.195)	FR: 3 (0.12) RR: 4 (0.156)
Brake disk runout	—	0.3 (0.012)
Brake fluid	DOT-4	—

Electrical Specifications

ITEM			SPECIFICATIONS
Battery	Capacity		12V - 18 Ah
	Current leakage		0.5 Ma max.
	Voltage (20°C/68°F)	Full charged	13.0 - 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.8 A/5 - 10 h
		Quick	9 A/1 h
Alternator	Capacity MXU 500i		310 - 400 W/5000 rpm
	Capacity MXU 700i Standard		308 W/5000 rpm
	Capacity MXU 700i LE		500 W/5000 rpm
Charging coil resistance (20°C/68°F)			0.1 - 0.3 Ω

Item	Standard
Spark plug	NGK-CR7E
Spark plug gap	0.6 - 0.7 mm (0.024 - 0.028 in.)
Ignition system	Full transistor digital ignition

Ignition timing	5° at idle rpm (MXU 500i) 10° at idle rpm (MXU 700i)

Spark Pug Type	NGK CR7E
Spark Plug Cap	4000-6000 ohms
Ignition Coil Resistance (primary)	Less than 1 ohm (terminal to terminal)
Ignition Coil (primary/CDI) Peak Voltage	250-375 DC volts (black/yellow to black)
Crank Position Sensor Resistance	90-110 ohms (green/white to blue/yellow)
Stator Coil Resistance	Less than 1 ohm (yellow to yellow)
Peak Voltage (trigger)	7.8-9.3 volts (green/white to blue/yellow)
AC Generator (no load) Output	60 AC volts @ 3000 RPM (black to black)

Specifications are subject to change without notice.

Battery

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

General Information

The KYMCO MXU 700i uses a GTX20L-BS 12V, battery.

ITEM			SPECIFICATIONS
Battery	Capacity		12V-18 Ah
	Current leakage		0.5 Ma max.
	Voltage (20°C/68°F)	Full charge	13.0 - 13.2 V
		Needs charging	Below 12.3 V
	Charging current	Normal	1.8 A/5 - 10 h
		Quick	9 A/1 h

After being in service, batteries require regular cleaning and recharging in order to deliver peak performance and maximum service life.

The following procedure is recommended for cleaning and maintaining lead-acid batteries. Always read and follow instructions provided with battery chargers and battery products.

Warning: Anytime service is performed on a battery, the following must be observed: keep sparks, open flame, cigarettes, or any other flame away. Always wear safety glasses. Protect skin and clothing when handing a battery. When servicing battery in enclosed space, keep the area well-ventilated.

1. Always remove the negative battery lead first.

2. Remove the battery from the battery compartment.

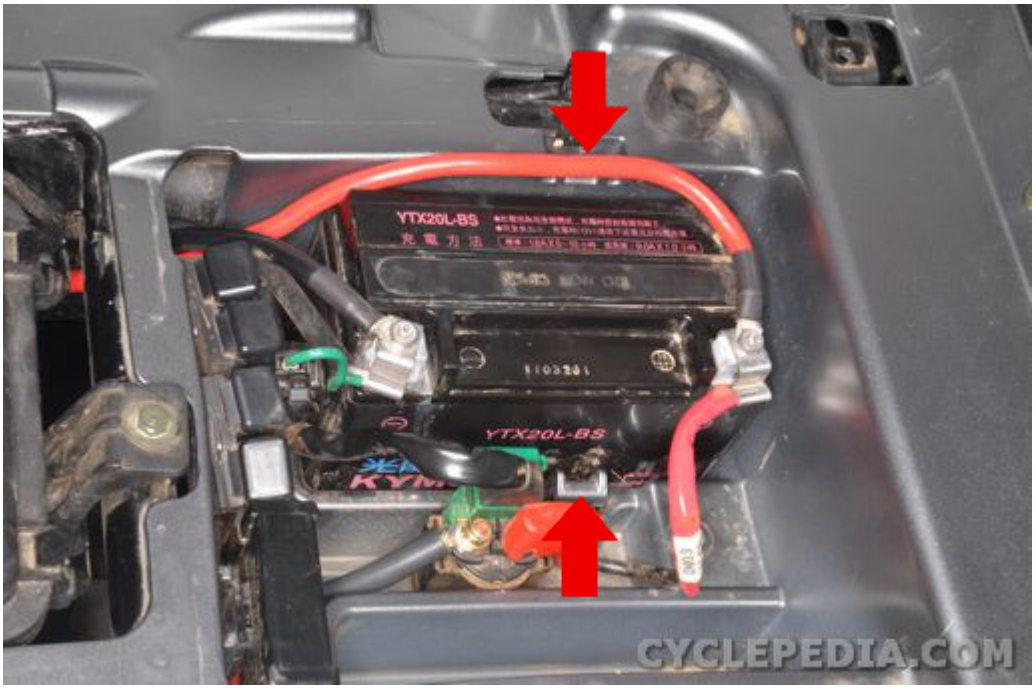
3. Thoroughly wash the battery and battery compartment with soap and water. NOTE: If battery posts, cable ends, or the battery case has a build-up of white/green powder residue, apply water and baking soda to neutralize acid; then flush off with warm soapy water.

4. Using a wire brush, clean the battery posts and cable ends removing all corrosive buildup. Replace damaged cables or cable ends.

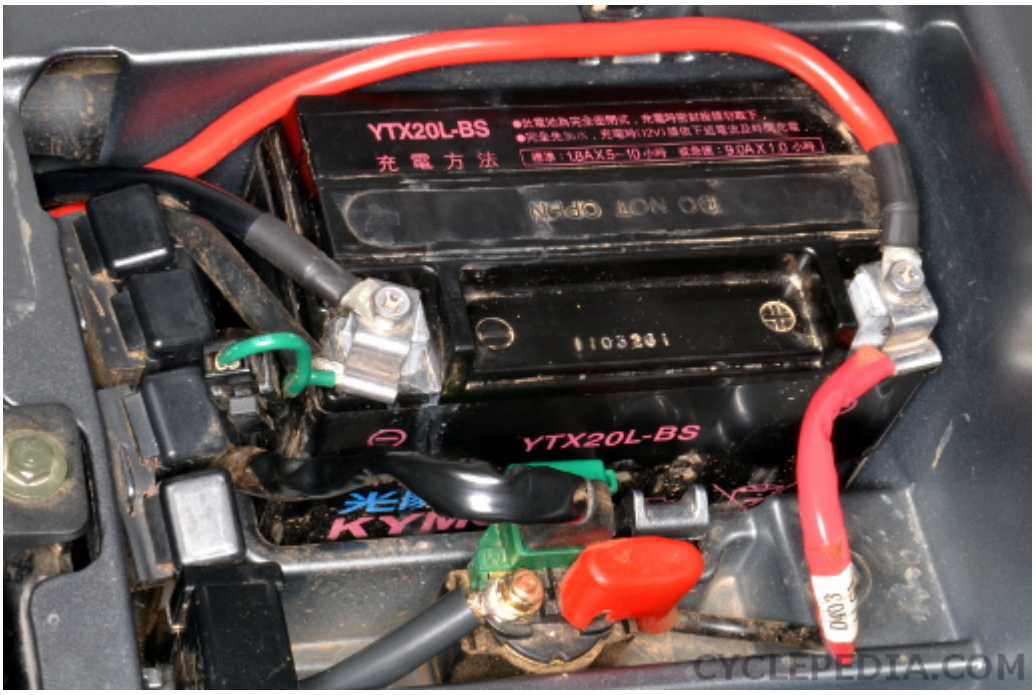
Removal

Remove the seat. See the Seat topic for more information.

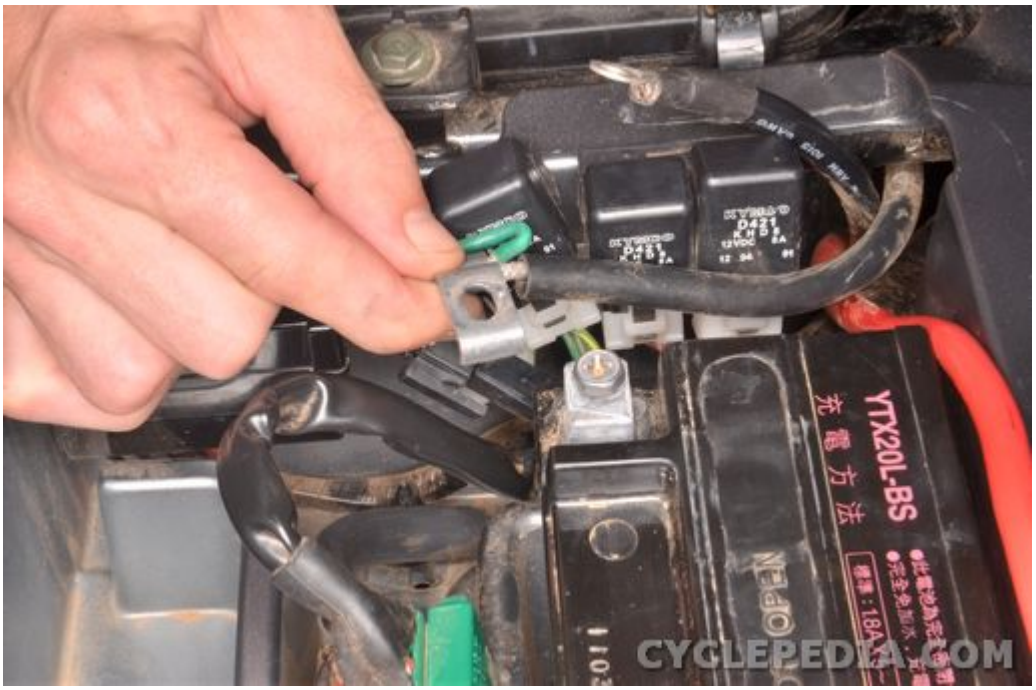
Turn OFF the ignition switch.



Free the rubber strap from the hooks.



Remove the negative battery cable (black) first with a #3 Phillips or 10 mm socket. Remove the positive battery cable (red) after the negative battery cable has been removed with a #3 Phillips or 10 mm socket.



Free the winch cables along with the battery cables if the vehicle is equipped with a winch.

Lift out the battery.

Testing

Voltage

Check the battery voltage with a multimeter set to read DC voltage (DCV). Place the positive probe onto the positive battery terminal and the negative probe to the negative battery terminal. If the battery reads under 12.3 V it is undercharged.

Battery Voltage (20°C/68°F)	Full charged	13.0 - 13.2 V
	Needs charging	Below 12.3 V

Current Leakage

Turn the ignition switch OFF. disconnect the negative (-) cable from the battery.

Set the multimeter to read amperage. When measuring current using a tester, set it to a high range, and then bring the range down to an appropriate level.

Connect the ammeter (+) probe to the negative (-) cable and the ammeter (-) probe to the battery (-) terminal.

With the ignition switch OFF, check for current leakage.

Current flow higher than the range selected may blow out the fuse in the tester. While measuring current, do not turn the ignition switch ON. A sudden surge of current may blow out the fuse in the tester.

If current leakage exceeds the specified value, a short circuit is likely.

Locate the short by disconnecting electrical connections one by one and measuring the current.

Battery Current (Leak)	0.5 Ma max

Charging System Testing

To test the charging system see the Charging System topic.

Battery Charging

Remove the battery.

Connect the charger positive (+) cable to the battery positive (+) terminal. Connect the charger negative (-) cable to the battery negative (-) terminal.

Charging current	Normal	1.8 A/5 - 10 h
	Quick	9 A/1 h

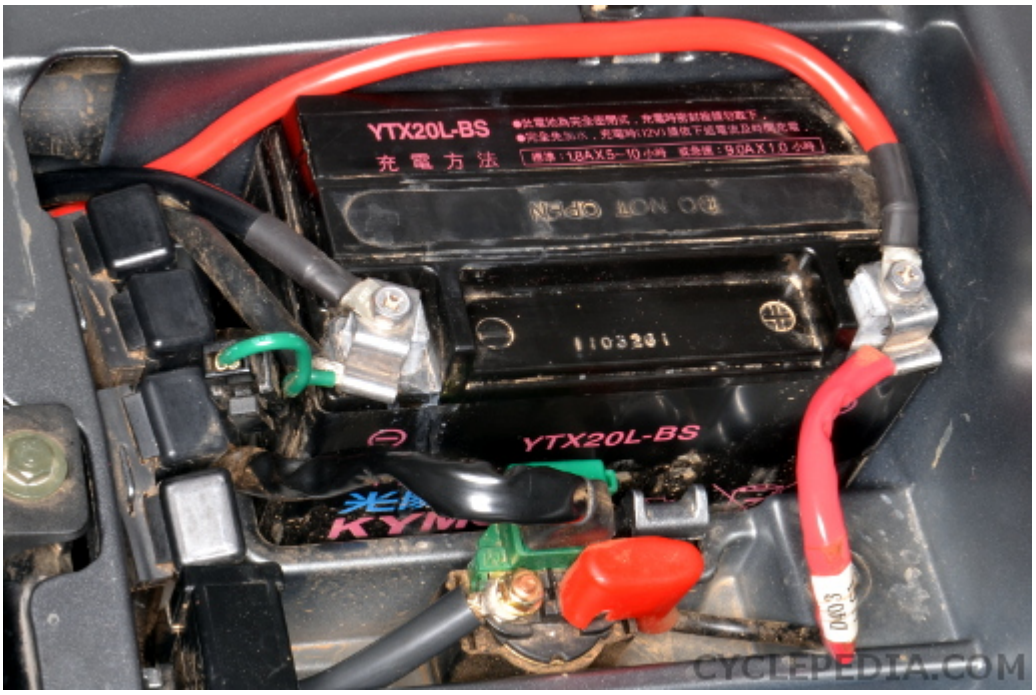
Quick charging should only be done in an emergency; slow charging is preferred.

For battery charging, do not exceed the charging current and time specified on the battery. Using excessive current or extending the charging time may damage the battery.

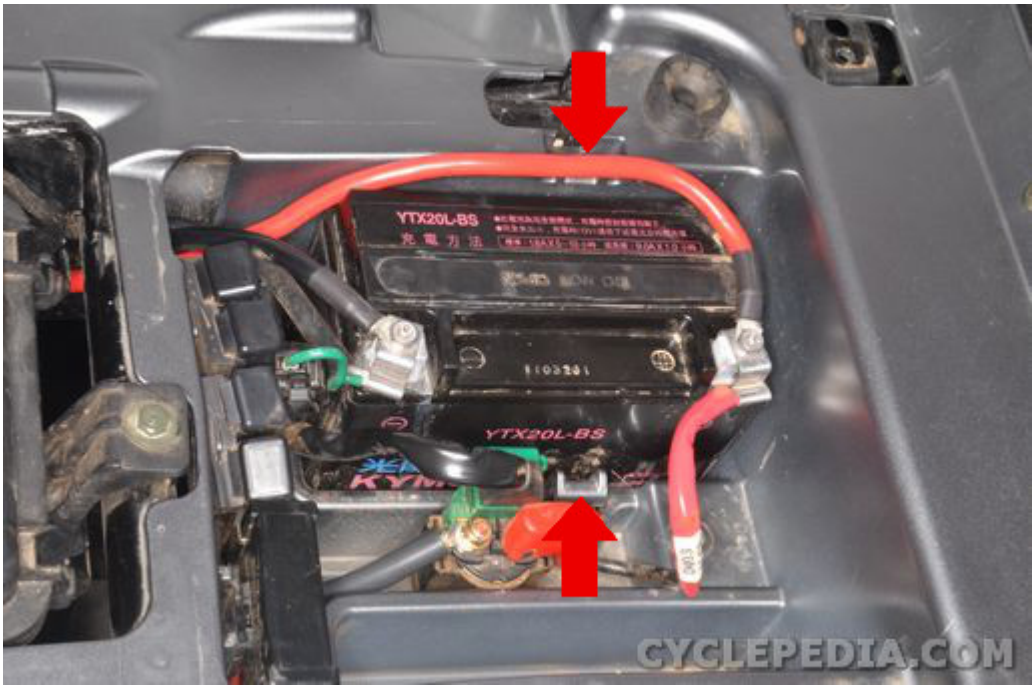
Use a suitable battery charger. Do not connect the charger leads to the batter while the charger is on. Also, do not remove the charger leads from the battery while the charger is on. Turn the charger off before connecting or disconnecting the charger leads.

Installation

Install the battery.



Install the winch leads with their corresponding battery cables if a winch is installed.Connect the positive cable to the positive batter terminal and thread in the terminal screw. Tighten the screw securely with a #3 Phillips or 10 mm socket. Place the negative lead over the negative batter terminal and thread in the screw. Tighten the screw securely with a #3 Phillips screwdriver or a 10 mm socket.



Install the battery strap.

Install the seat. See the Seat topic for more information.

Charging System

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

ITEM		SPECIFICATIONS
Alternator	Capacity MXU 500i	310 - 400 W/5000 rpm
	Capacity MXU 700i Standard	308 W/5000 rpm
	Capacity MXU 700i LE	500 W/5000 rpm
Charging coil resistance (20°C/68°F)		0.1 - 0.3 Ω

Stator Coil Resistance	Less than 1 ohm (yellow to yellow)
AC Generator (no load) Output	60 AC volts @ 3000 RPM (black to black)

You will need a digital multimeter (Fluke model 73) to inspect the charging system.

Battery

To access and test the battery see the Battery topic.

Charging Voltage

Make sure the battery is fully charged.
Check the charging voltage with a multimeter set to read DC voltage (DCV).
Connect a tachometer. Start the engine and let warm up to for several minutes.
Stop the engine.

Place the positive probe onto the positive battery terminal and the negative probe to the negative battery terminal.
Start the engine.

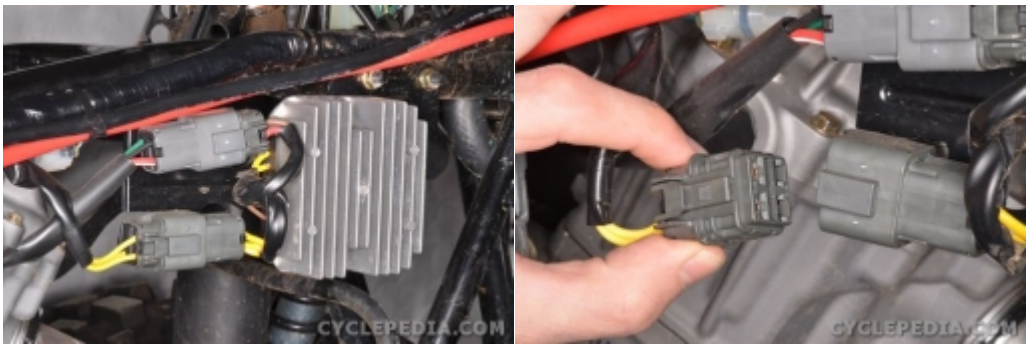
Turn on the lights and turn the dimmer switch to "HI". Rev the engine to 5,000 rpm and measure the voltage. The voltage should be greater than the battery voltage, and no more than 15.0 V. The standard at 5,000 rpm is 14.0 ± 1 V.
Turn the ignition switch off before disconnecting any charging system components.

Stator Coil

Coil Resistance

Remove these components	
Component	Topic
Side covers	Side Covers
Left mudguard	Mudguards and Footrests

Trace the wires up from the generator cover.



Unplug the 4-pin stator connector.

Set the multimeter to read ohms of resistance (Ω).

Check that the alternator coil resistance is within specification by measuring the resistance between the three yellow wires.

Alternator coil resistance	yellow - yellow	0.1 - 0.3 Ω

Also, check for continuity between the yellow wires and a ground. There should not be continuity.

Replace the stator coil if the resistance is not in specification or there is continuity between a yellow wire and ground. See the Generator Cover (700) or the Generator Cover (500) topic for more information.

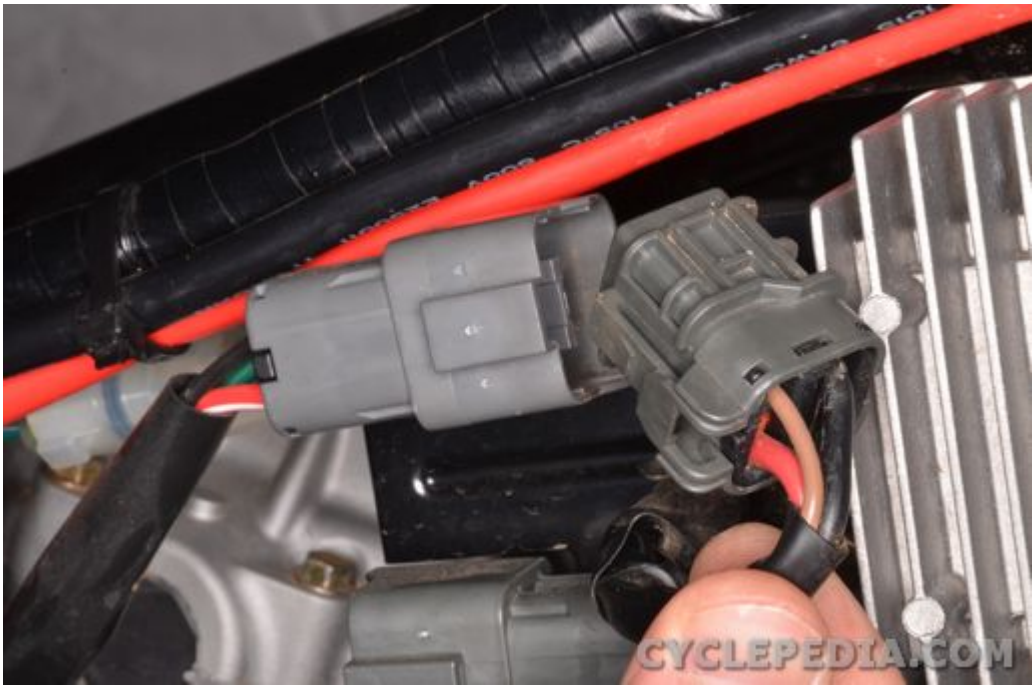
Regulator/Rectifier

Inspection

Connectors

Inspect the connections of the regulator/rectifier connectors. Inspect the connectors for loose wires and corroded terminals.

Battery Line

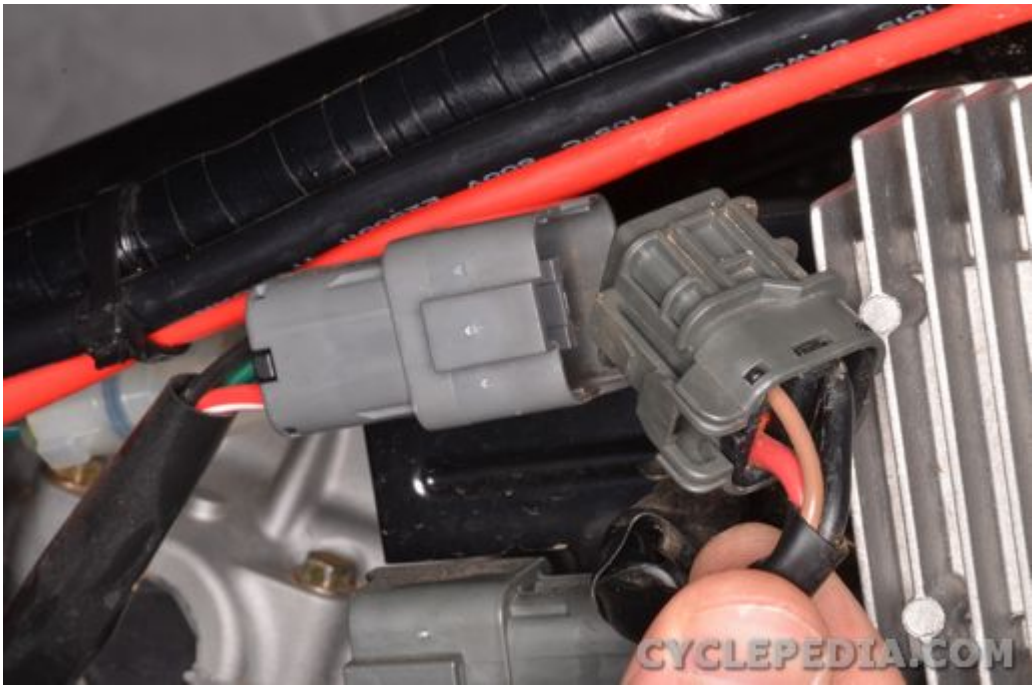


Unplug the four pin regulator/rectifier connector with the green, black, and red/white wires.

Set the multimeter to read DC voltage (DCV).

Measure the voltage between the Red/White wire terminal on the harness side of the connector and a ground. There should be battery voltage at all times.

Voltage Feedback Line



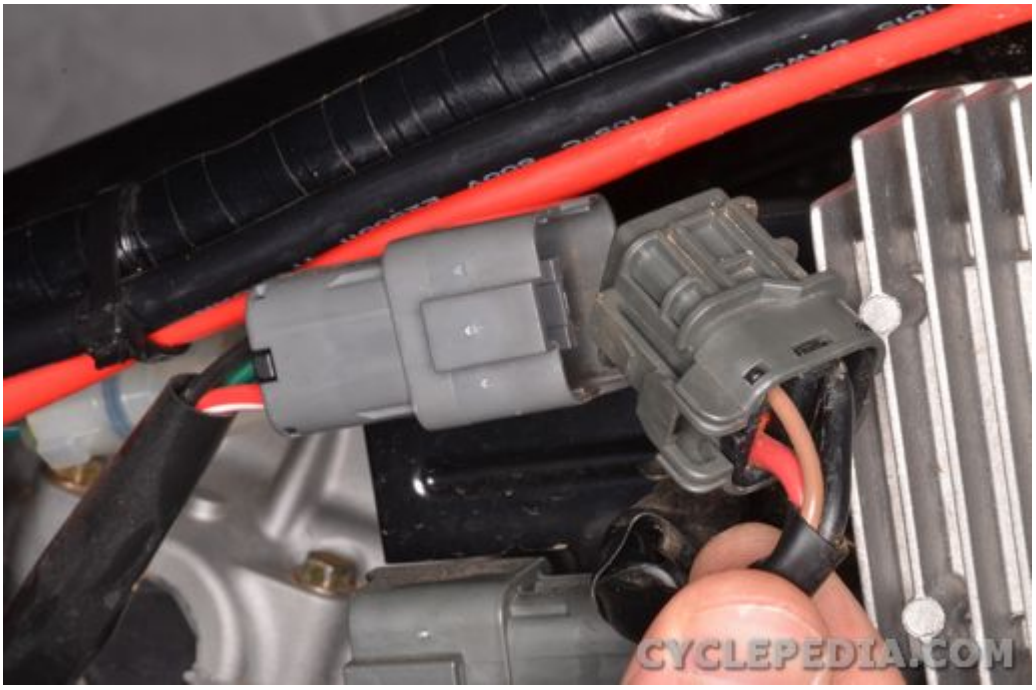
Unplug the four pin regulator/rectifier connector with the green, black, and red/white wires.

Set the multimeter to read DC voltage (DCV).

Measure the voltage between the black wire terminal on the harness side of the connector and a ground.

There should be battery voltage with the ignition switch ON, and no voltage with the ignition switch OFF.

Ground Line



Unplug the four pin regulator/rectifier connector with the green, black, and red/white wires.

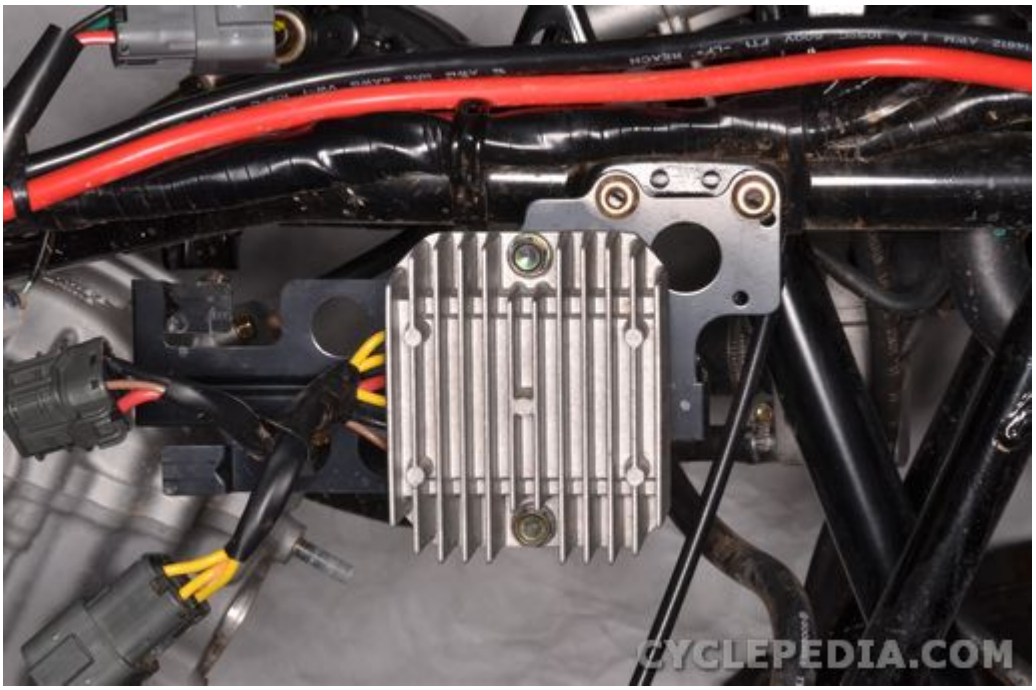
Set the multimeter to read ohms of resistance (Ω).

Check the continuity between the Green wire terminal and ground. There should be continuity at all times.

Removal

Remove the front fender. See the Front Fender topic for more information.

Unplug the regulator/rectifier connectors.

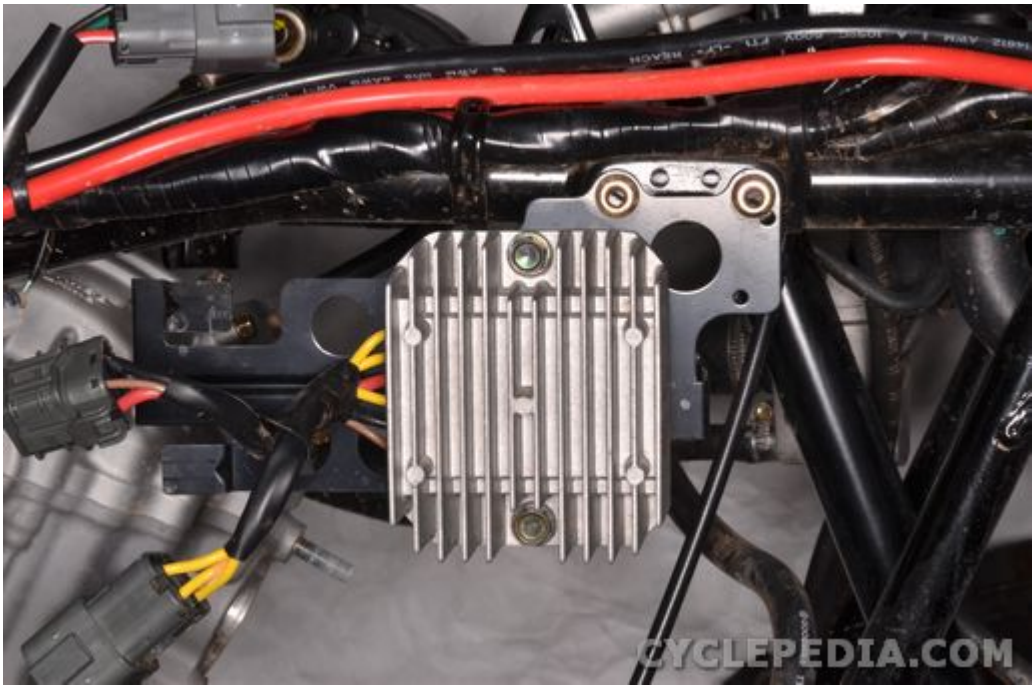


Remove the two regulator/rectifier bracket nuts.

Remove the regulator/rectifier and bracket. Remove the two bolts to free the regulator/rectifier from the bracket.

Installation

Install the regulator/rectifier to the bracket and tighten the two bolts securely. Fit the bracket into place on the right side of the frame.



Install the two regulator/rectifier bracket mounting nuts and tighten them securely.

Plug in the regulator/rectifier connectors and secure them to the bracket.

Install the front fender. See the Front Fender topic for more information.

Fuses and Relays

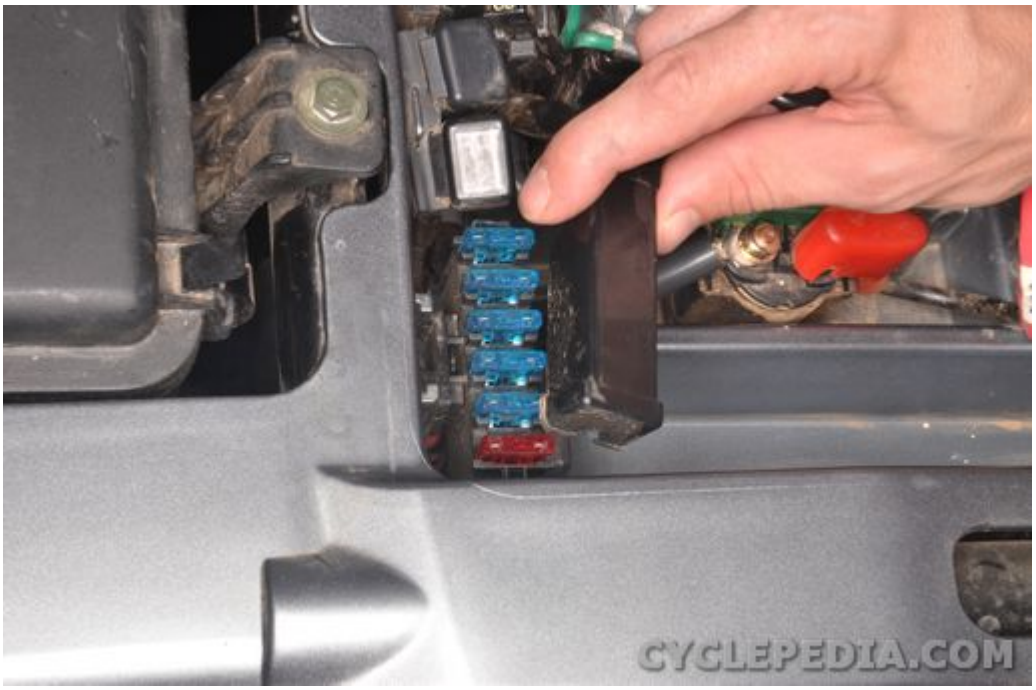
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Turn the ignition switch to the OFF position before unplugging relays or fuses.

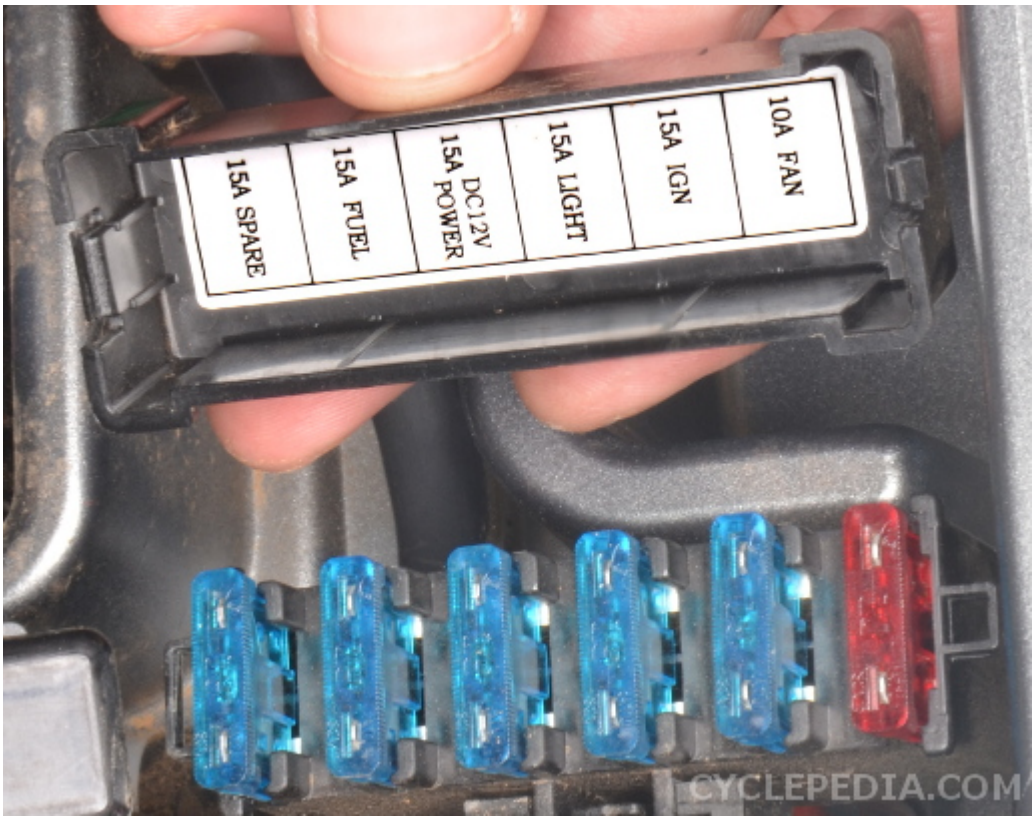
Fuse Box

Remove the seat. See the Seat topic for more information.

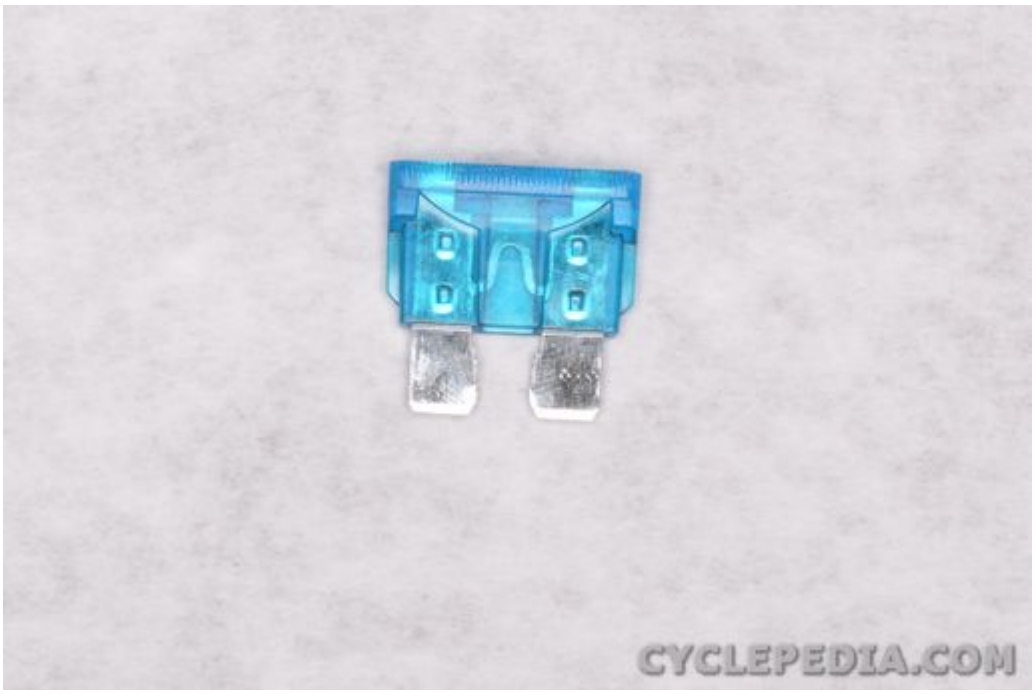
The fuse box is located near the battery under the seat.



Remove the fuse box cover.



The cover has labels for the fuse slots.

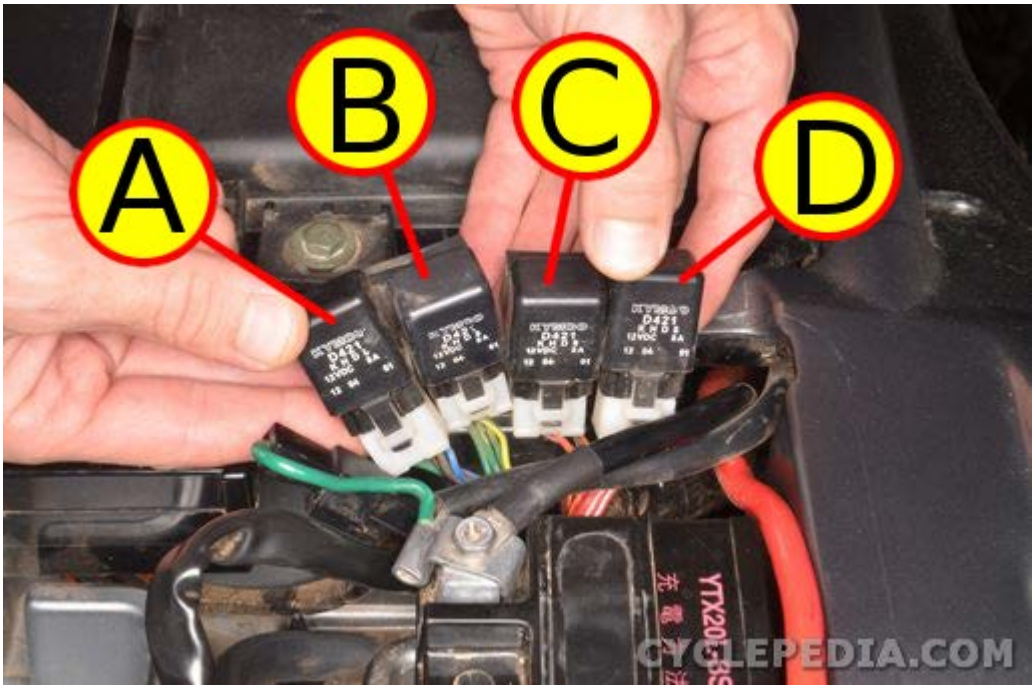


Check for blown fuses and replace them as needed. The fuse must be replaced with a new item with the same amp rating.

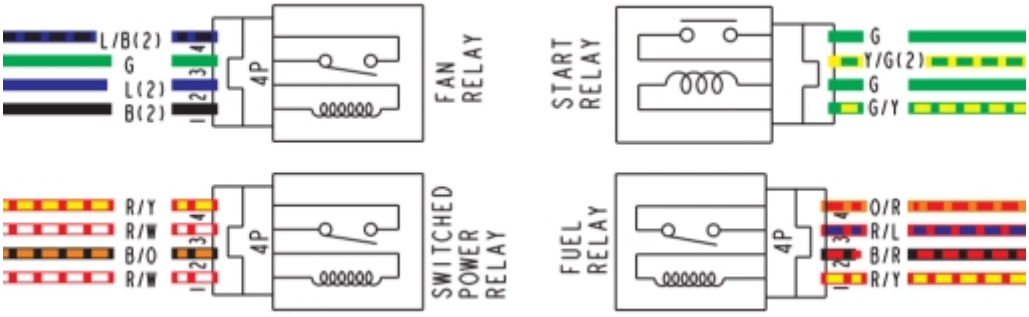
Main Fuse

The main fuse is located with the starter relay. See the Starting System topic for more information on checking this fuse.

Relays

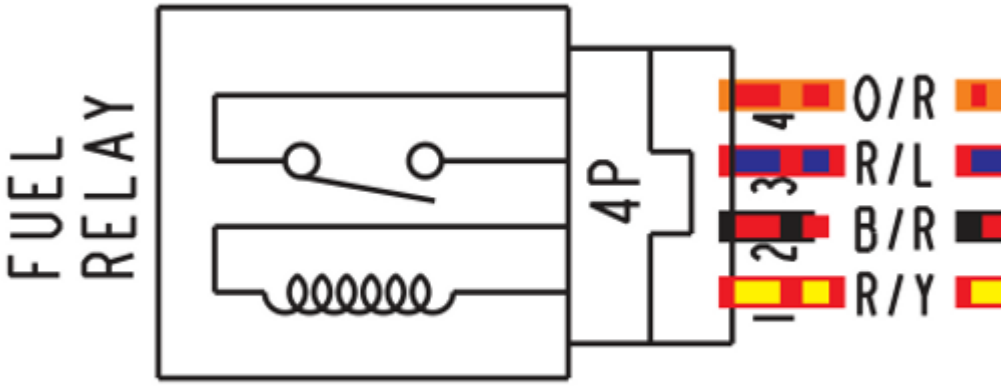


The fan (A), engine start (B), fuel pump (C), and switched power (D) relays are located near the battery.

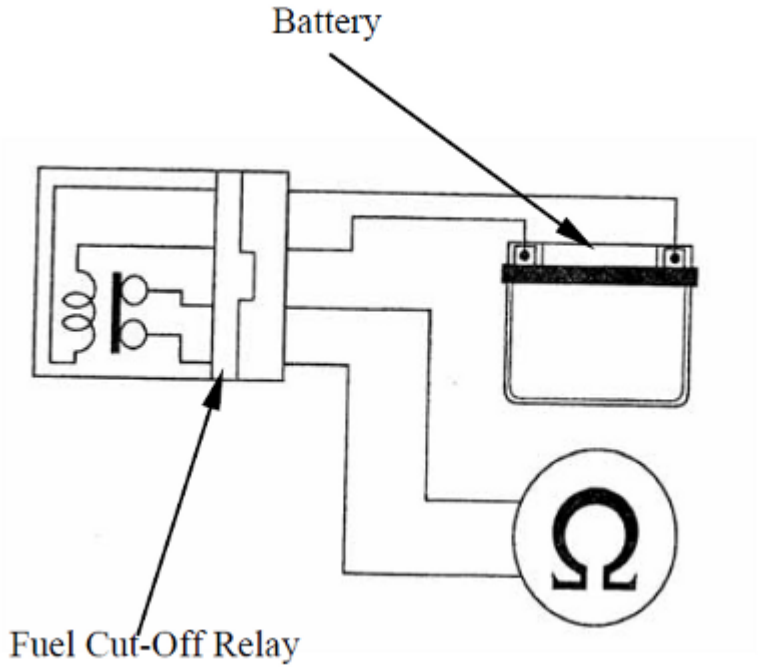


Inspect the relays in the same manner.

Remove the relay to be tested. Set the multimeter to read ohms of resistance (Ω).



Check for continuity between the switch terminals of the relay. In the case of the fuel pump relay these are the terminals that match up with the red/blue and orange/red wires.

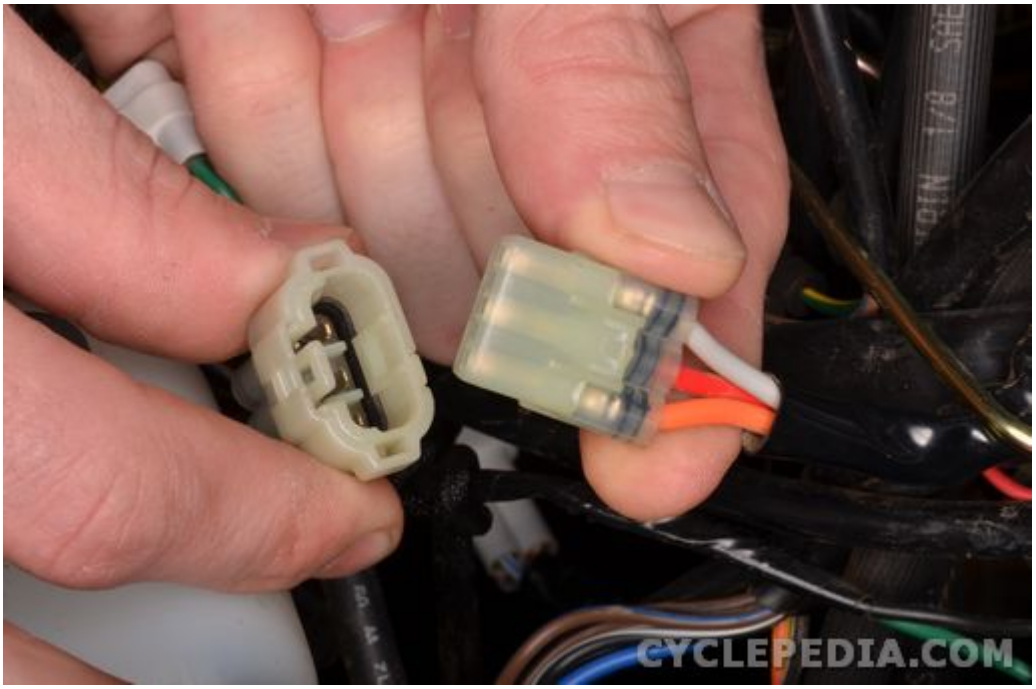


Jump a 12 V battery to the coil terminals of the relay.
There should be continuity only when 12 V battery connected. If there is not continuity when the 12 V battery is connected, replace the relay.
The starter relay (Starter Mag) is also located under the seat.To test this relay see the Starting System topic.

Ignition System

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.
The ignition timing is set at the factory and is not adjustable. To troubleshoot the ignition system, you will need a digital multimeter (Fluke model 73). Perform the following checks. Before performing any tests make sure the electrical connections are not loose or corroded. Also, make sure the engine has good compression, the transmission is in neutral, and the engine kill switch is in the run position.
Make sure the battery is fully charged and the fuses are in good condition. See the Battery and Fuses and Relays topics for more information.

Electrical Connections



Make sure all electrical connections are good. There must not be open, loose, or rusted connections.

Troubleshooting

See the troubleshooting chart on the Electrical Systems General Information topic.

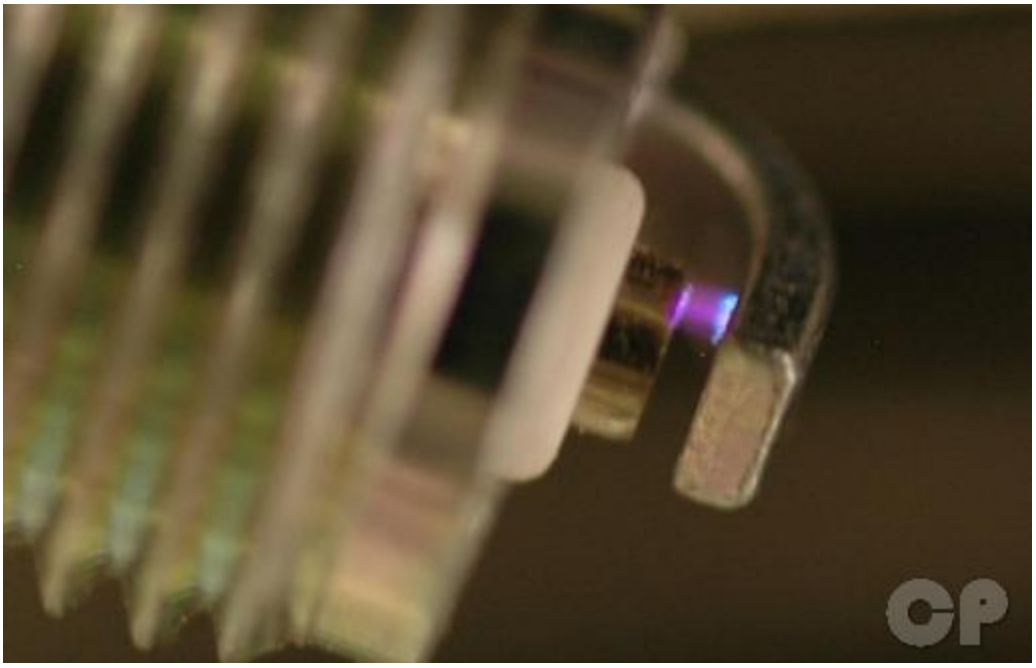
Spark Check

Warning: Do not touch the spark plug or spark plug wire while cranking or running the engine as this can result in a severe shock.

Remove these components	
Component	Topic
Seat	Seat
Fuel tank and shield	Fuel Tank

Check the spark plug to see if it is the correct type and gapped properly. If the spark plug is black and fouled, replace it. See the Spark Plug topic for more information.

Connect a known good spark plug to the cap and ground the plug to the engine. There should still be a spark plug installed in the cylinder head.



Turn the key as to start the engine and check that the plug will spark. If the plug does not spark go through the following procedures to find the problem.

Ignition Coil

Primary Resistance

Remove the front fender. See the Front Fender topic for more information.

Unplug the connector from the ignition coil.

Set the multimeter to read ohms of resistance (Ω).

Measure the resistance between the ignition coil terminals.

Ignition Coil Resistance (primary)	Less than 1 ohm (terminal to terminal)

Spark Plug Cap Resistance

Set the multimeter to read ohms of resistance (kΩ).

Measure the resistance between each end of the spark plug cap.

Spark Plug Cap	4000 - 6000 ohms

Ignition Coil Peak Voltage

Set the multimeter to read DC voltage (DCV) and connect it to the PVA.

Have the spark plug grounded to the frame as with the spark check.

With the primary leads still connected to the ignition coil, touch the peak voltage adapter meter leads to the ignition coil leads.

Turn the ignition switch to ON, hold in one of the brake levers, and push the engine start button. Allow the engine to crank for no more than 5 seconds. Repeat this a few times and record the peak voltage.

Removal

Remove the front fender. See the Front Fender topic for more information.

The ignition coil is mounted to the left side of the frame.

Unplug the connector from the ignition coil.

Pull the spark plug cap off of the spark plug.

Remove the two ignition coil mounting bolts.

Remove the ignition coil.

Installation

Fit the ignition coil into place.

Install the two ignition coil mounting bolts and tighten the bolts securely.

Plug in the ignition coil lead connector.

Fit the spark plug cap onto the spark plug.

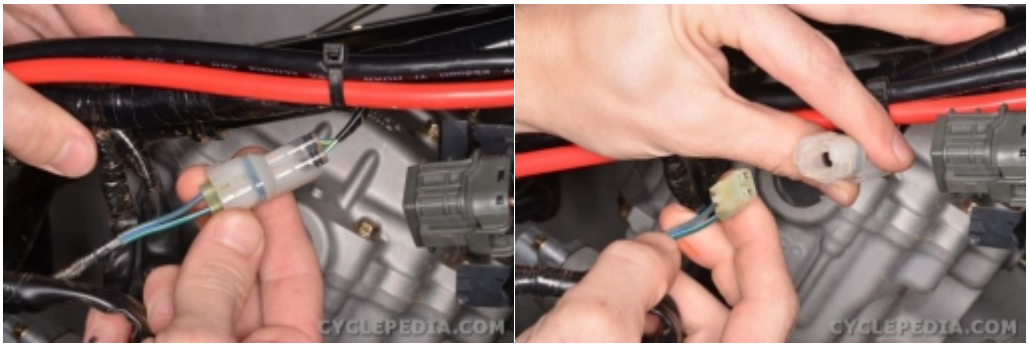
Install the front fender. See the Front Fender topic form more information.

Ignition Pulse Generator / Crank Position Sensor

Resistance

Remove these components	
Component	Topic
Side covers	Side Covers
Left mudguard	Mudguards and Footrests

Trace the wires up from the generator cover.



Unplug the 2-pin ignition pulse generator / crank position sensor connector.

Set the multimeter to read ohms of resistance (Ω).

Measure the resistance between the terminals of the ignition pulse generator connector.

Crank Position Sensor Resistance	90-110 ohms (green/white to blue/yellow)

To replace the crank position sensor see the Generator Cover topic.

Peak Voltage

Set the multimeter to read DC voltage (DCV) and connect it to the PVA. Touch the positive meter lead to the green/white wire. Touch the negative meter lead to the blue/yellow wire.

Turn the ignition switch to ON, hold in one of the brake levers, and push the engine start button. Allow the engine to crank for no more than 5 seconds. Repeat this a few times and record the peak voltage.

Crank Position Sensor Peak Voltage (trigger)	7.8-9.3 volts (green/white to blue/yellow)

To replace the crank position sensor see the Generator Cover topic.

Ignition Advance Check

Connect the diagnostic tool. See the Diagnostic Tool topic for more information.

Start the engine and let it run until it reaches 80° C at idle.

Bring up the data analysis page 04.

At idle the ignition advance should show as indicated below at idle with a closed throttle.

Ignition timing	5° at idle rpm (MXU 500i) 10° at idle rpm (MXU 700i)

ECU

Use the diagnostic tool to confirm the ECU version. See the Diagnostic Tool topic for more information.

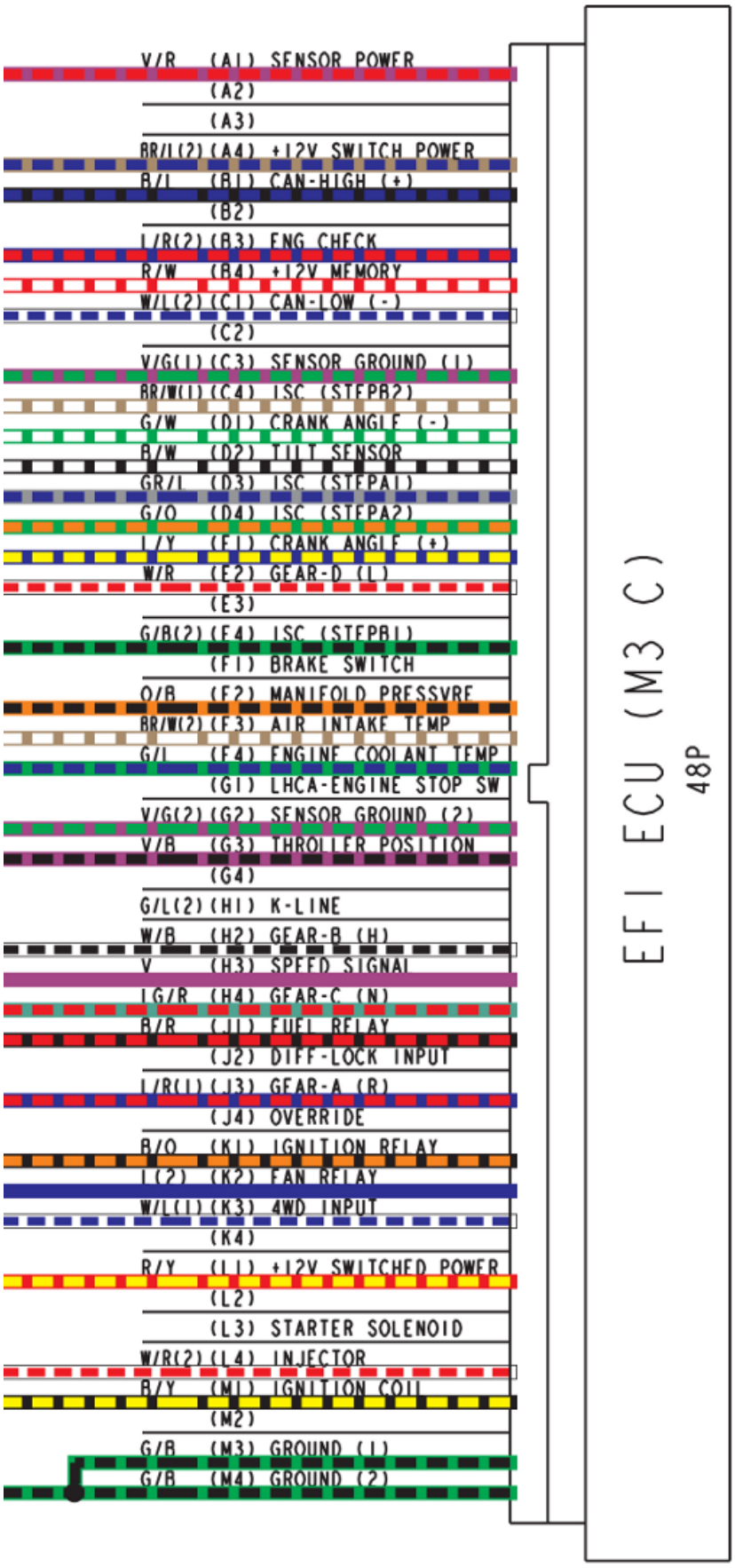
ECU Input Voltage

Remove these components	
Component	Topic
Side covers	Side Covers
Left mudguard	Mudguards and Footrests
Front fender	Front Fender

Make sure the ignition switch is in the OFF position.

Unplug the ECU connector (See the removal section below).

Set the multimeter to read DC voltage (DCV).


V/R (A1) SENSOR POWER
(A2)
(A3)
BR/L(2) (A4) +12V SWITCH POWER
B/L (B1) CAN-HIGH (+)
(B2)
L/R(2) (B3) ENG CHECK
R/W (B4) +12V MEMORY
W/L(2) (C1) CAN-LOW (-)
(C2)
V/G(1) (C3) SENSOR GROUND (1)
BR/W(1) (C4) ISC (STEPB2)
G/W (D1) CRANK ANGLE (-)
B/W (D2) TILT SENSOR
GR/L (D3) ISC (STEPA1)
G/O (D4) ISC (STEPA2)
L/Y (E1) CRANK ANGLE (+)
W/R (E2) GEAR-D (L)
(E3)
G/B(2) (E4) ISC (STEPB1)
(F1) BRAKE SWITCH
O/B (F2) MANIFOLD PRESSURE
BR/W(2) (F3) AIR INTAKE TEMP
G/L (F4) ENGINE COOLANT TEMP
(G1) LHCA-ENGINE STOP SW
V/G(2) (G2) SENSOR GROUND (2)
V/B (G3) THROTTLER POSITION
(G4)
G/L(2) (H1) K-LINE
W/B (H2) GEAR-B (H)
V (H3) SPEED SIGNAL
LG/R (H4) GEAR-C (N)
B/R (J1) FUEL RELAY
(J2) DIFF-LOCK INPUT
L/R(1) (J3) GEAR-A (R)
(J4) OVERRIDE
B/O (K1) IGNITION RELAY
L(2) (K2) FAN RELAY
W/L(1) (K3) 4WD INPUT
(K4)
R/Y (L1) +12V SWITCHED POWER
(L2)
(L3) STARTER SOLENOID
W/R(2) (L4) INJECTOR
B/Y (M1) IGNITION COIL
(M2)
G/B (M3) GROUND (1)
G/B (M4) GROUND (2)
EFI ECU (M3 C)
48P

Connect the meter (+) probe to the B4(R/W) wire and the meter (-) probe to the M3(G/B) wire to measure the voltage. There should be 12 V.

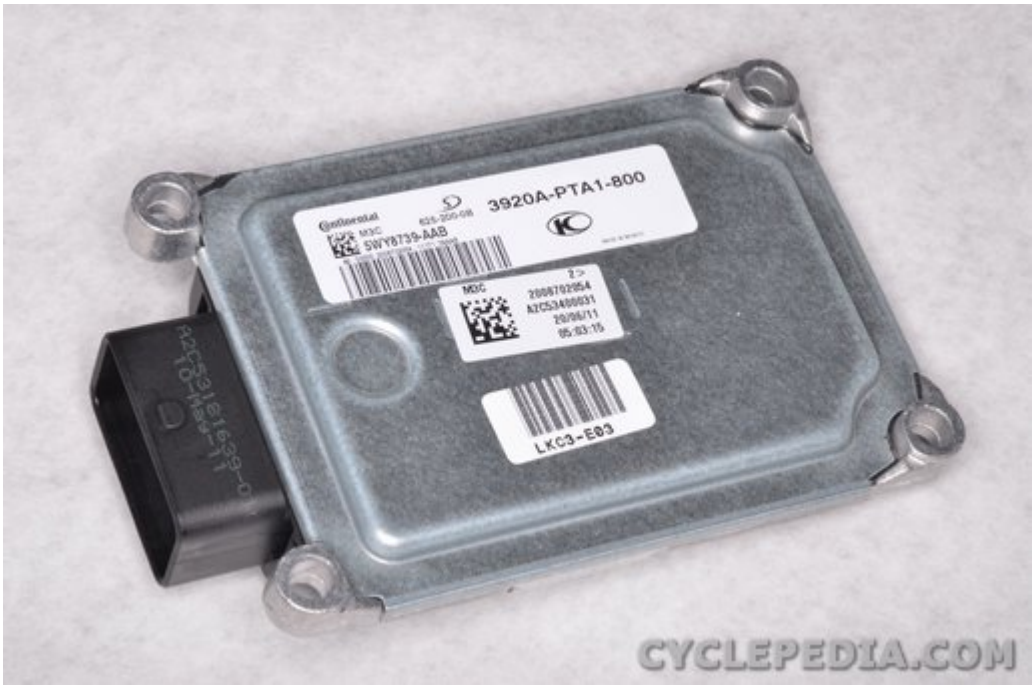
Removal

Remove the right side cover. See the Side Covers topic for more information.

The ECU is located on the right side of the frame.

Push in the tab and rotate the clip to unlock the ECU. Unplug the ECU connector. Check the ECU for damaged pins.

To remove the ECU bracket remove the two anti-tamper fasteners. Remove the four bolts to remove the ECU from the bracket.



Check the back of the ECU for information.

Installation

Install the ECU to the bracket and tighten the four bolts securely. Fit the bracket to the frame and install two new anti-tamper fasteners.

Plug in the ECU connector.

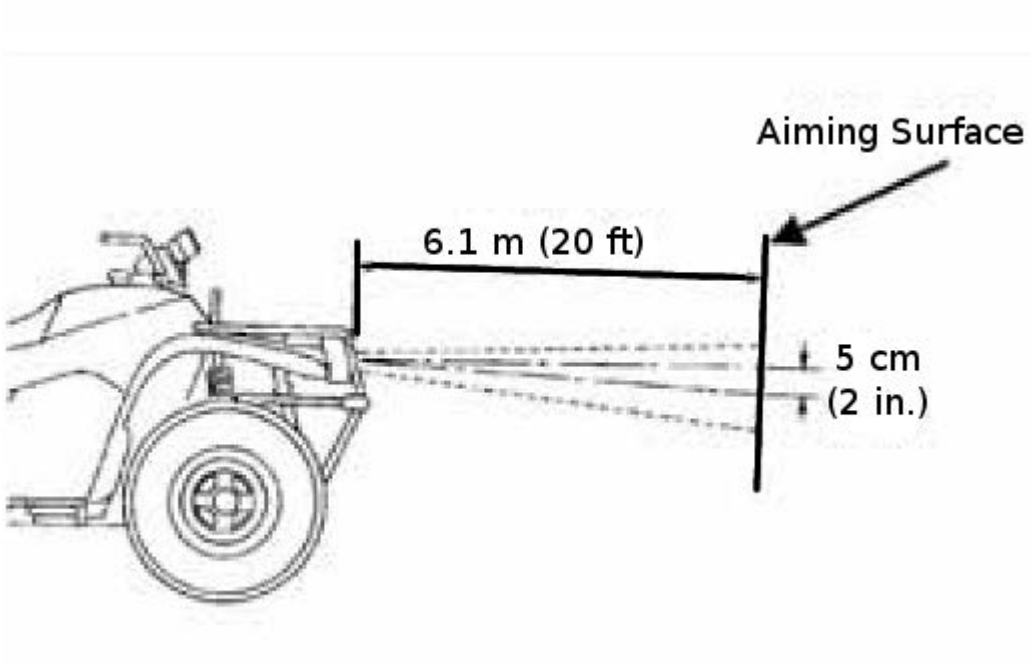
Rotate the clip and lock the connector to the ECU.

Lights

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Headlight Aim

The headlights can be adjusted vertically and horizontally. The geometric center of the HIGH beam light zone is to be used for vertical and horizontal aiming.



1. Position the ATV on a level floor so the headlights are approximately 6.1 m (20 ft) from an aiming surface (wall or similar aiming surface).

NOTE: There should be an average operating load on the ATV when adjusting the headlight aim.

2. Measure the distance from the floor to the mid-point of each headlight.

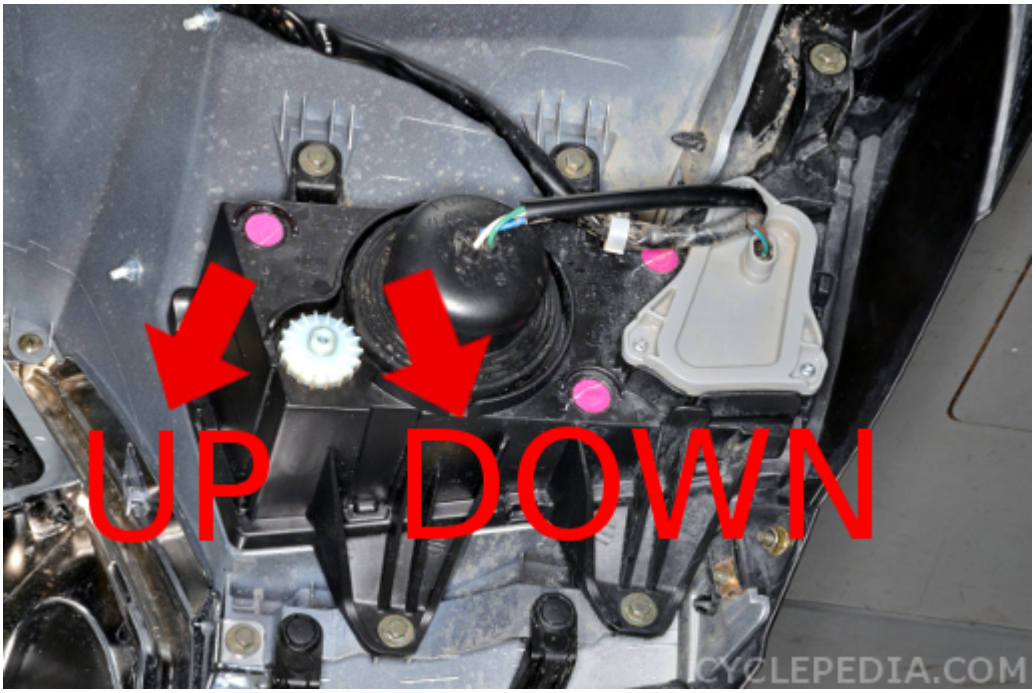
3. Using the measurements obtained in step 2. make horizontal marks on the aiming surface.

4. Make vertical marks which intersect the horizontal marks on the aiming surface directly in front of the headlights.

5. Switch on the lights. Make sure the HIGH beam is on DO NOT USE LOW BEAM.

6. Observe each headlight beam aim Proper aim is when the most intense beam is centered on the vertical mark 5 cm (2 in.) below the horizontal mark on the aiming surface.

7. Adjust each headlight by turning the adjuster knobs as needed.



Headlights

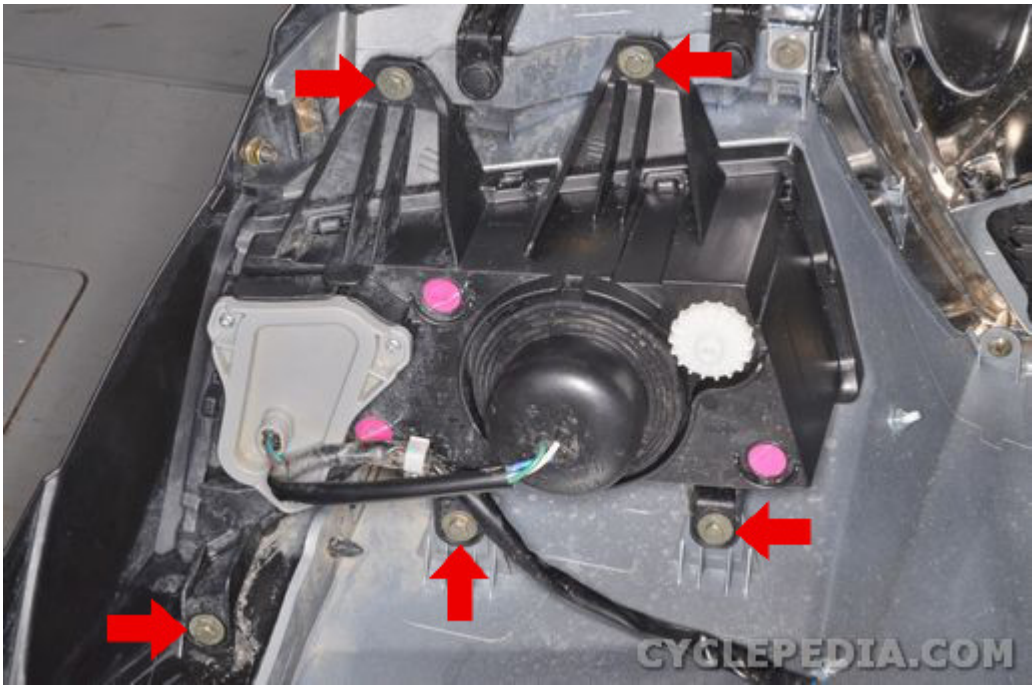
Bulb Replacement

Pull back the rubber cover and unplug the headlight bulb connector.

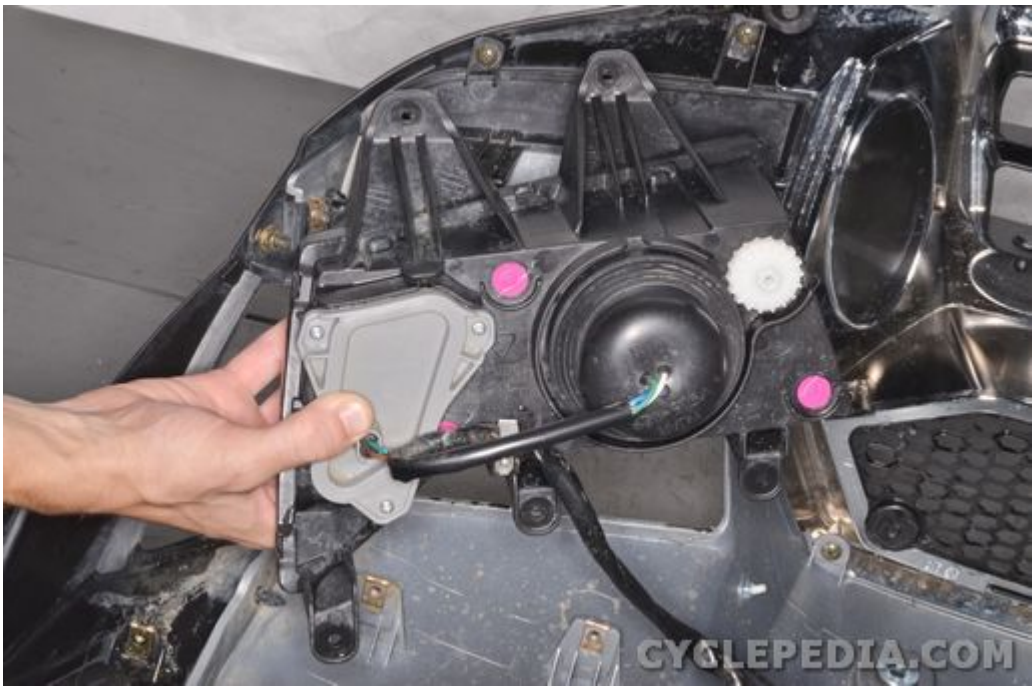
Unhook the bulb clip and replace the bulb as needed. Be sure to secure the bulb with the clip on installation. Return the rubber cover to its installed position when finished.

Removal

Remove the front fender. See the Front Fender topic for more information.



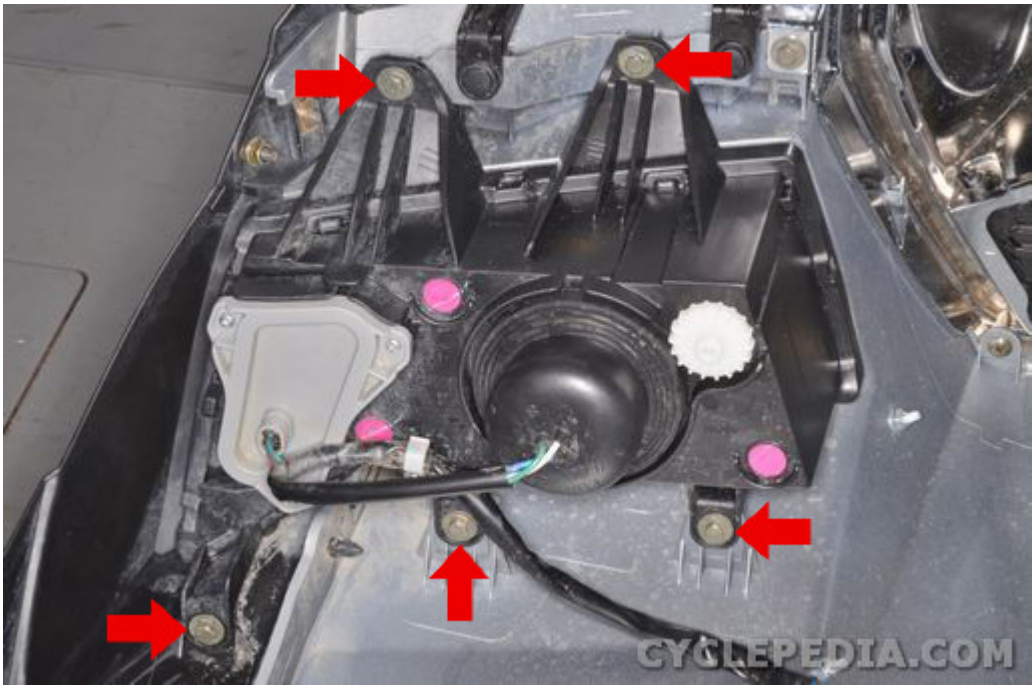
Remove the five screws.



Remove the headlight from the front fender.

Installation

Install the headlight assembly into the front fender.

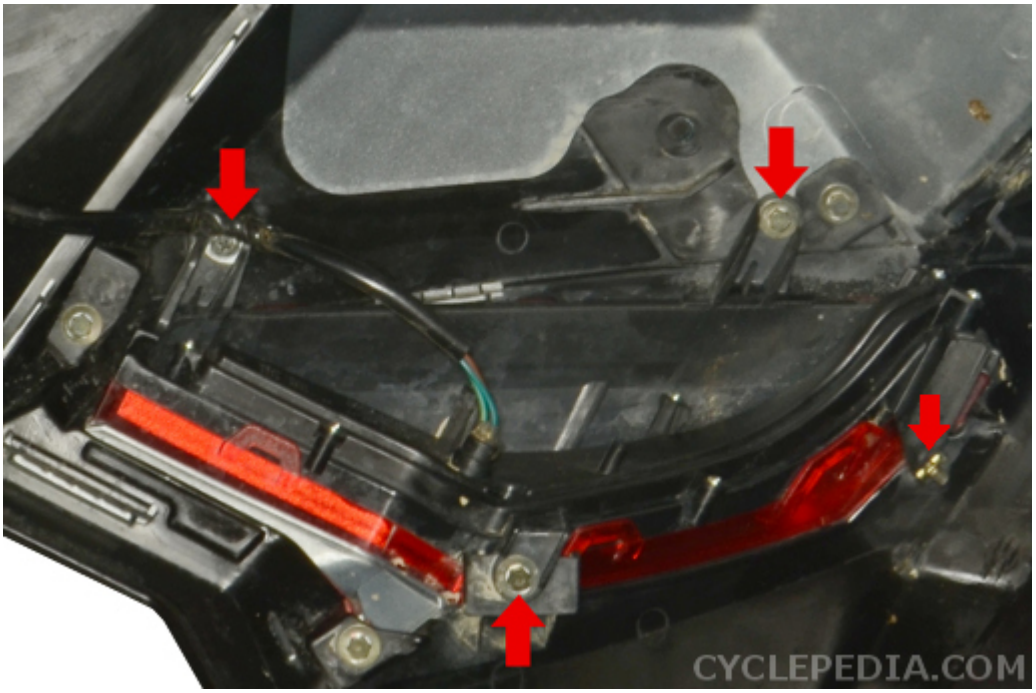


Install the five screws and tighten them securely.

Taillights

Removal

Remove the rear fender. See the Rear Fender topic for more information.

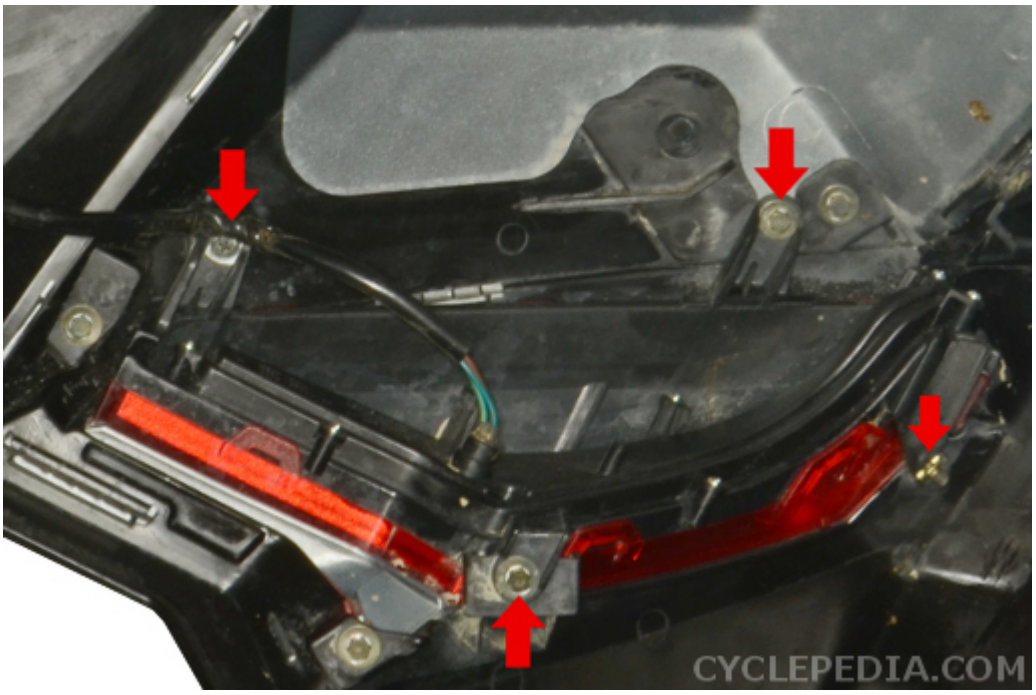


Free the taillight wires from the clamp with the inner screw. Remove the four taillight screws.

Remove the taillight from the rear fender. The taillights are LED that must be replaced as a unit if they fail.

Installation

Fit the taillight unit into place.



Install the four taillight screws and tighten them securely. Guide the wires through the clamp with the inner bolt.

Install the rear fender. See the Rear Fender topic for more information.

Starter Motor

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

Inspection

Remove these components	
Component	Topic
Seat	Seat
Side covers	Side Covers
Mudguards	Mudguards and Footrests

Pull back the rubber cover from the starter motor terminal nut.

Set the multimeter to read DC voltage (DCV).

Turn the ignition switch to the ON position. Place the transmission in neutral and make sure the engine kill switch is in the RUN position.

Touch the positive meter lead to the starter motor terminal nut and the negative meter lead to a ground. Press the start button and measure the voltage. The meter should show ~ 12 DCV and the starter motor should operate. If the voltage shows correctly, but the starter motor doesn't operate the starter motor should be replaced.

To test the starter relay see the Starting System topic.

Removal

Remove these components	
Component	Topic
Seat	Seat
Side covers	Side Covers
Mudguards	Mudguards and Footrests
CVT (700 only)	CVT Removal

Turn OFF the ignition switch.

Pull back the rubber cover from the starter motor terminal. Loosen the starter motor terminal nut with a 10 mm socket and free the lead from the terminal. Remove the starter motor mounting bolts with an 8 mm socket. Free the ground wire.

Remove the starter motor.

Installation

Make sure the starter motor O-ring is in good condition. Apply fresh engine oil to the O-ring.

Fit the starter motor into place on the top of the crankcases. The output end of the starter motor must engage with the starter reduction gear.

Install the ground lead with the starter motor mounting bolt as shown. Tighten the starter motor mounting bolts to specification with an 8 mm socket.

ITEM	THREAD SIZE AND TYPE	TORQUE		
		Nm	kgf-m	ft-lb
STARTER MOTOR BOLT		10.8 ± 1	1.1 ± 0.1	8

Connect the lead to the starter motor. Tighten the nut securely with a 10 mm socket. Move the rubber cover into place over the terminal.

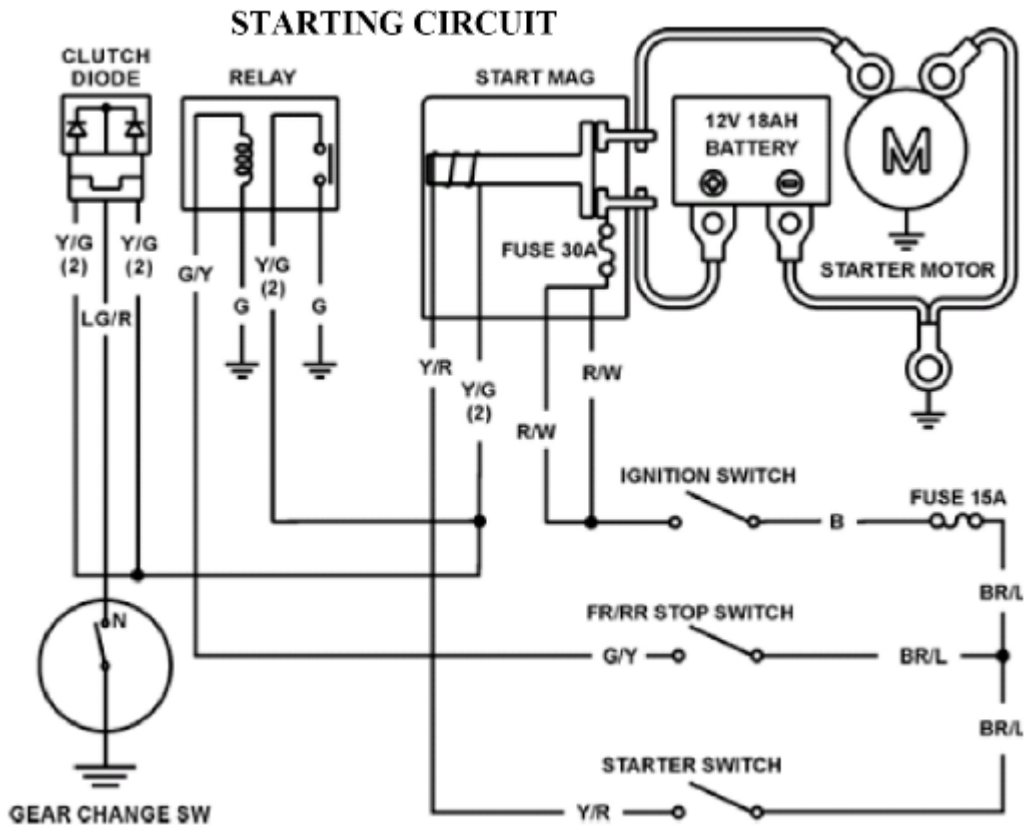
Install these components	
Component	Topic
CVT (700 only)	CVT Installation
Mudguards	Mudguards and Footrests
Side covers	Side Covers
Seat	Seat

Starting System

SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

You will need a digital multimeter (Fluke model 73) to inspect the starting system.

System Diagram



TROUBLESHOOTING

Starter motor will not turn

• Fuse burned out
• Weak battery
• Faulty ignition switch
• Faulty starter clutch or gear
• Faulty starter relay
• Poorly connected, broken or shorted wire
• Faulty starter motor

Lack of power

• Weak battery
• Loosed wire or connection
• Foreign matter stuck in starter motor

Starter motor rotates but engine does not start

• Faulty starter pinion
• Starter motor rotates in reverse
• Weak battery

Starter Motor

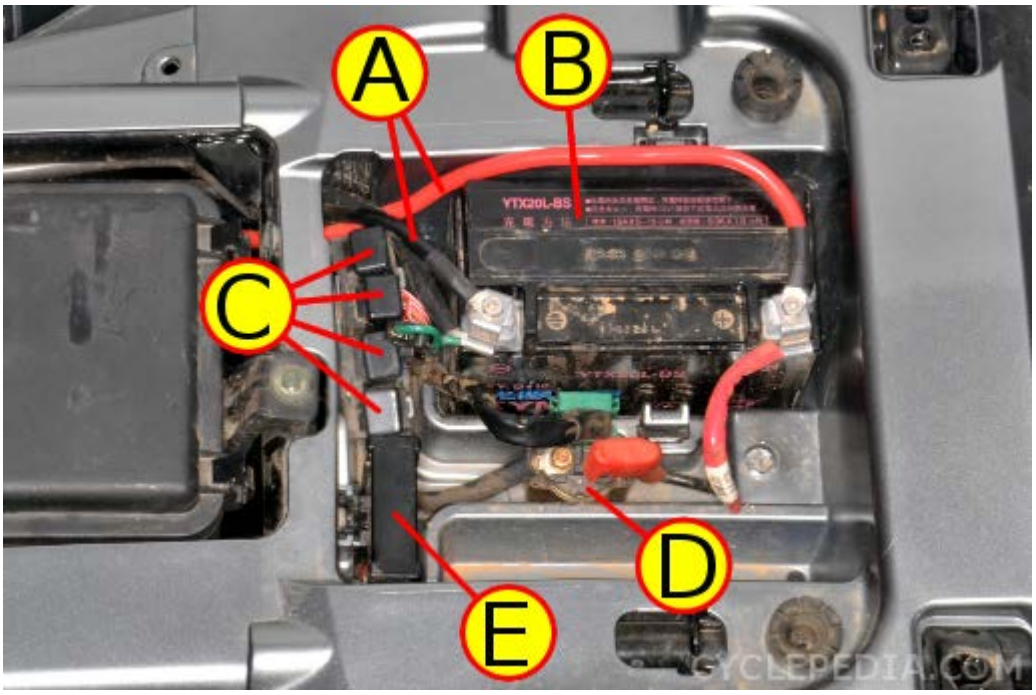
See the Starter Motor topic.

Starter Relay (Starter Mag)

To test the engine start relay see the Fuses and Relays topic.

Operation Inspection

Remove the seat. See the Seat topic.



The starter relay (D) is located next to the battery.

A. Winch Leads (optional)

B. Battery

C. Relays (see below)

D. Starter Relay

E. Fuse Box

Turn the ignition switch to the ON position. Make sure the engine kill switch is in the RUN position and the transmission is in neutral.

Press the button to start the engine and listen for the starter relay to click. Inspect the starter relay if it doesn't click.

Fuse

The ignition switch should be in the OFF position.

Unplug the connector from the starter relay.

Remove the fuse (30A). Replace the fuse if it is blown.

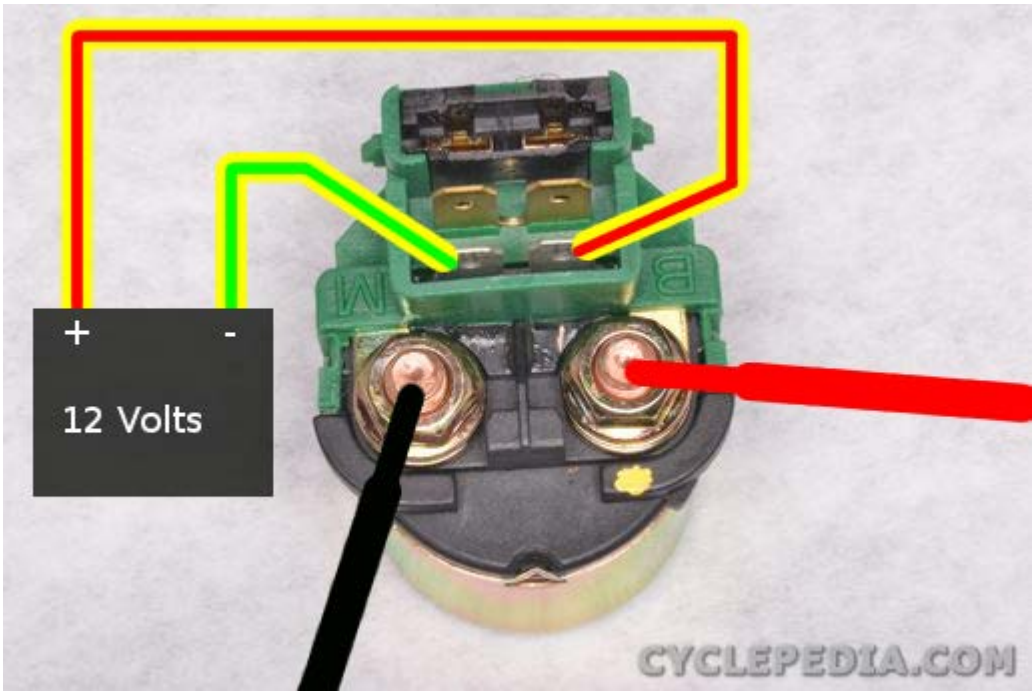
Voltage Inspection

Set the multimeter to read DC voltage (DCV).

Check the voltage with the starter relay connector plugged in. Measure the voltage between the yellow/red wire and a ground. There should only be voltage with the gear position switch in neutral and the key is turned to start the engine or the brake pedal is pushed in and the key is turned to start the engine.

Continuity Inspection

Remove the starter relay.



Connect a fully charged 12 V battery positive wire to the relay switch Yellow/Red wire terminal and negative wire to the Yellow/Green wire terminal. There should be continuity between the cable terminals while the battery is connected, and no continuity when the battery is disconnected. Note: the fuse must be installed.

Removal

Remove the starter relay from its holder in the rear fender. Unplug the connector from the starter relay. Remove the positive battery lead and starter motor lead nuts with a 10 mm socket. Free the positive battery and starter motor leads from the terminals.

Installation

Connect the starter motor lead to the terminal marked M. Connect the positive battery lead to the terminal marked B. Tighten the terminal nuts securely with a 10 mm socket.

Install the fuse (30A).

Plug in the starter relay connector.

Switches

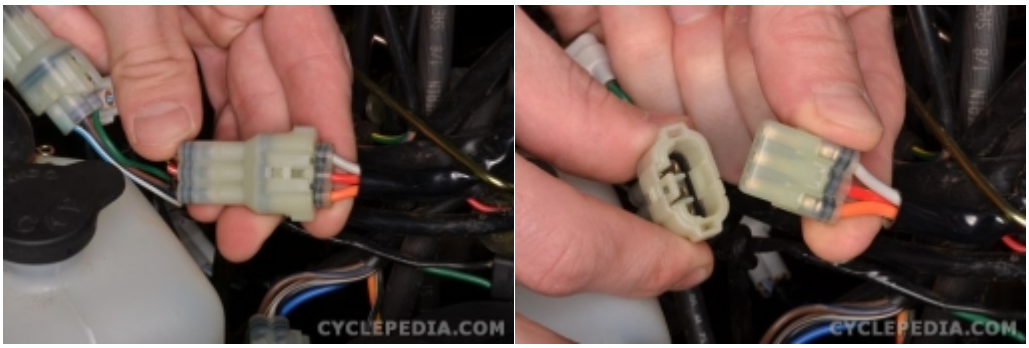
SAFETY FIRST: Protective gloves and eyewear are recommended at this point.

To test these switches, you will need a digital multimeter set to Ω (Ohms of resistance). If a switch does not meet specification replace it. Check the wiring diagrams for the continuity diagrams for the specific model being tested. See the Wiring Diagrams topic for more information.

Disconnect the battery prior to doing resistance testing. See the Battery topic for more information.

Ignition Switch

Remove the front cover. See the Front Cover topic for more information.



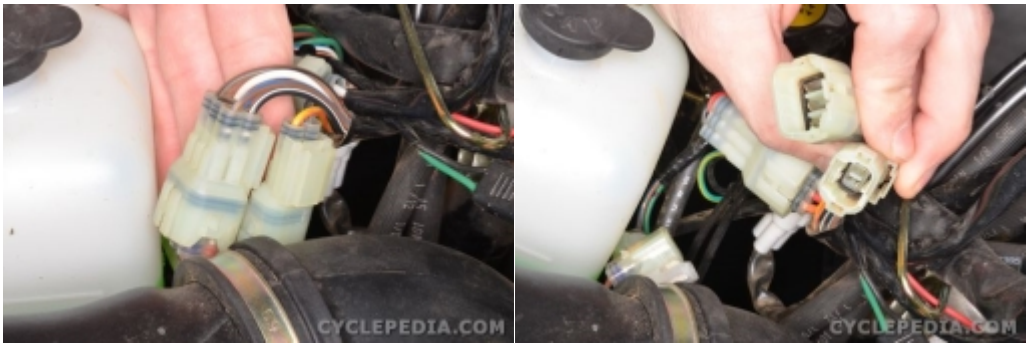
Unplug the ignition switch connector.

Check for continuity on the switch side of the connector. With the switch in the ON position there should be continuity between the orange and red wires. Turn the switch to the LIGHTS position. There should still be continuity between the orange and red wires, but there should also be continuity between the red and gray wires.

To remove the ignition switch see the Instrument Cover topic.

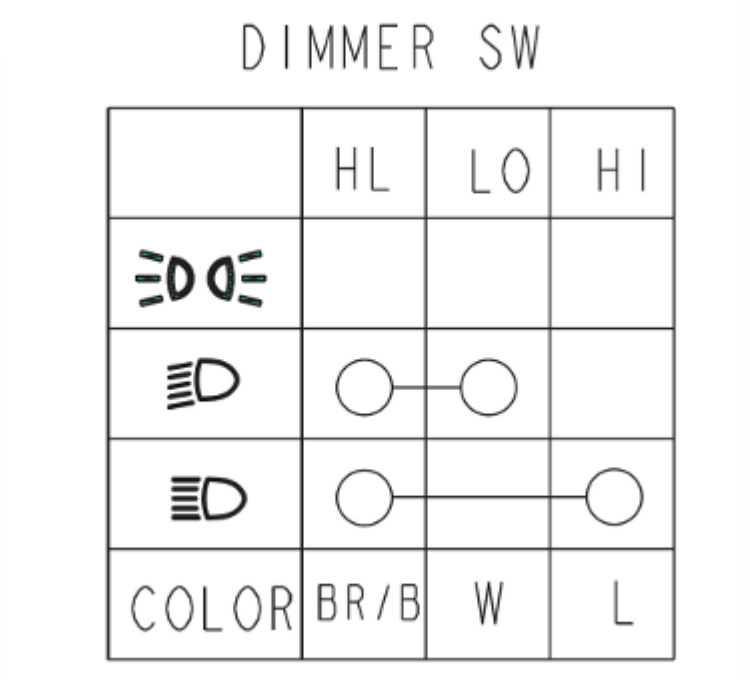
Left Handlebar Switches

Remove the upper cover. See the Front Fender topic for more information.



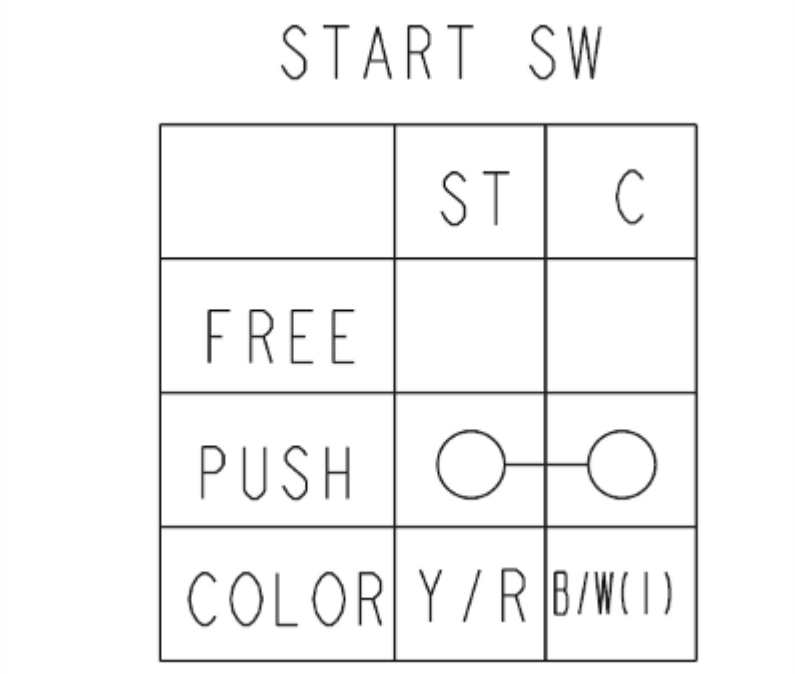
Unplug the left handlebar switch connectors.

Dimmer Switch



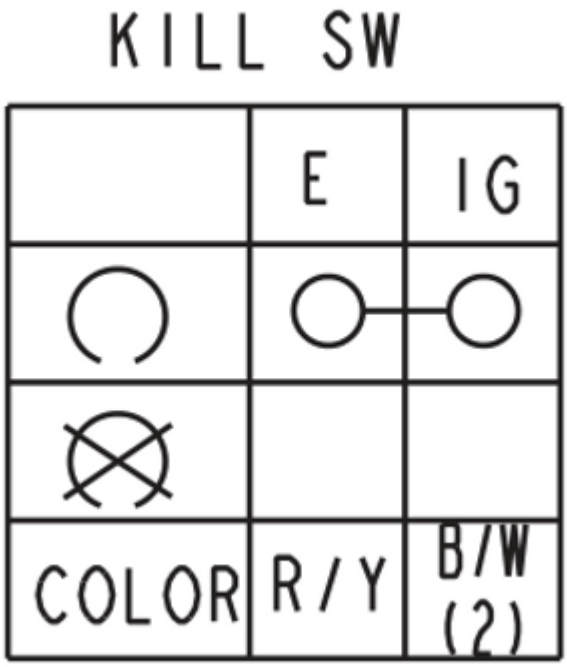
Check the dimmer switch for continuity as indicated.

Engine Start Switch



Check the engine start switch for continuity as indicated.

Engine Kill Switch

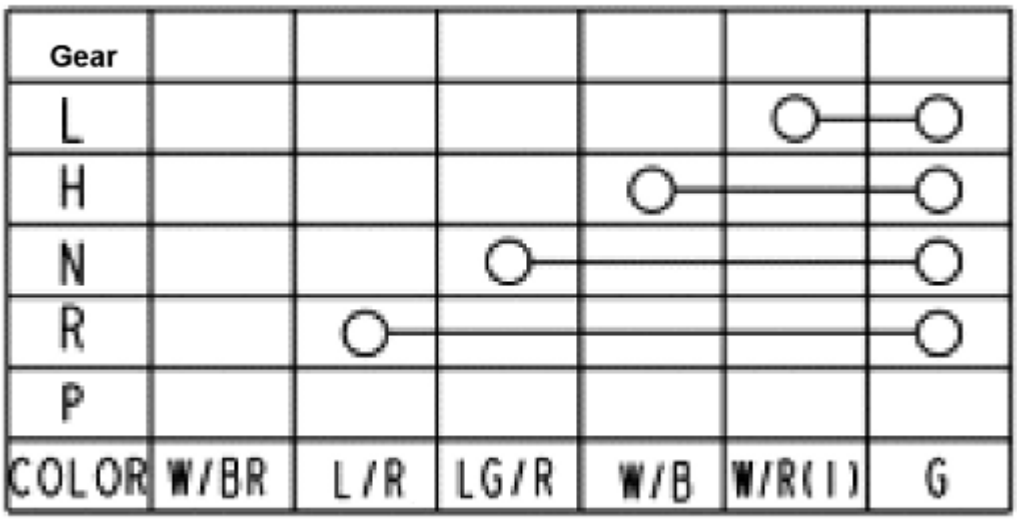


Check the engine stop switch for continuity as indicated.

Gear Position Switch

Remove the right side cover. See the Side Covers topic for more information.

Trace the wires up from the gear position switch. Unplug the gear position switch connector.



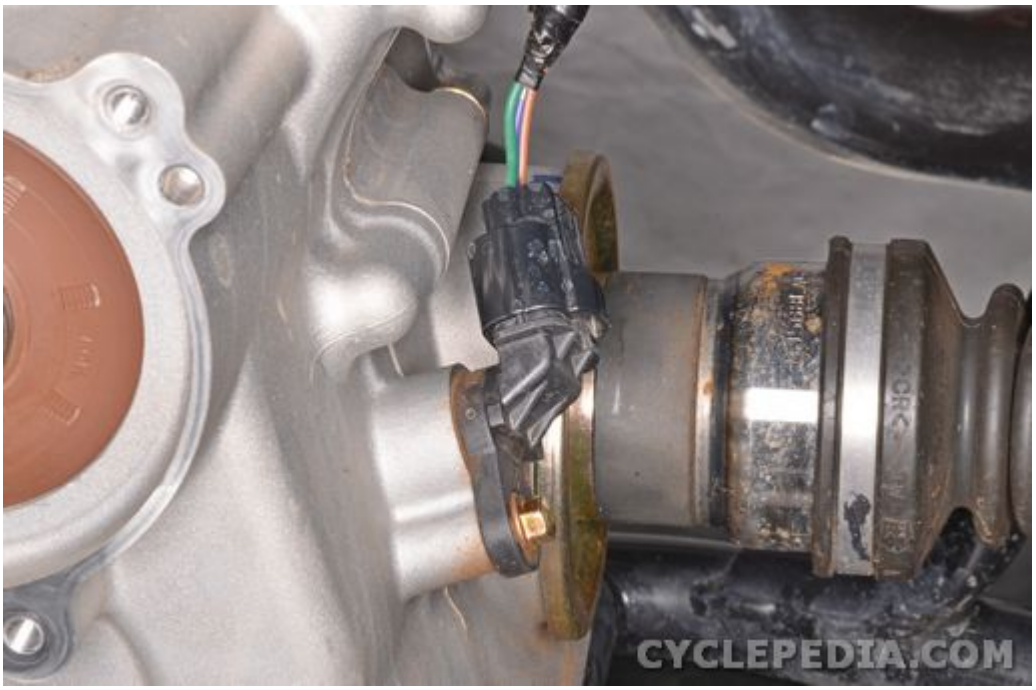
Gear						
L					○	○
H				○		○
N			○			○
R		○				○
P						
COLOR	W/BR	L/R	LG/R	W/B	W/R(I)	G

Check for continuity between the switch wire terminals and a ground (G) as indicated.

Neutral - Green
Reverse - Black
Low - Pink
High - Brown

To replace the gear position switch see the Crankcase topic.

Speed Sensor



The speed sensor is located on the back of the crankcase.
Inspect the speed sensor connector. Make sure the connector is making good contact with the sensor. If the speed sensor looks good but the speedometer doesn't function replace the speedometer with a known good unit.

If the known good speedometer fails to function replace the speed sensor.

Replacement

Unplug the connector from the speed sensor.

Remove the speed sensor mounting bolt with an 8 mm socket.

Remove the speed sensor.

Inspect the speed sensor O-ring and replace it as needed. Install the speed sensor.

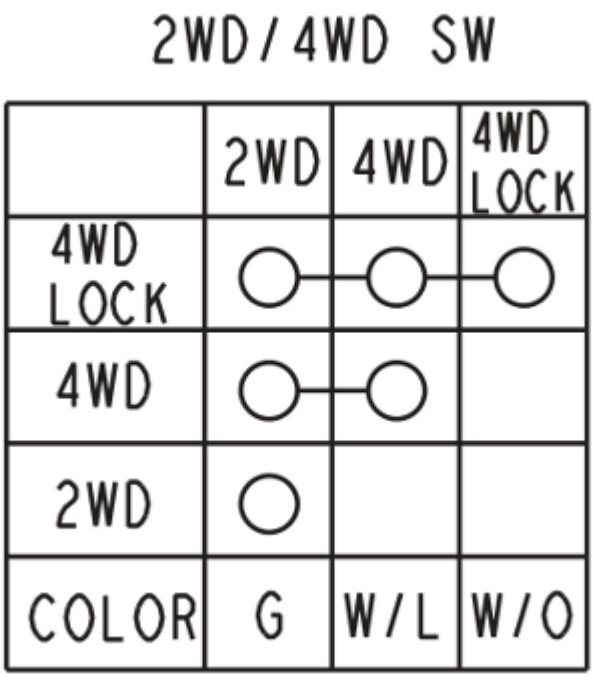
2WD/4WD Actuator and Switch

2WD/4WD Switch

Resistance

Remove the front fender. See the Front Fender topic for more information.

Unplug the 2WD/4WD shifting motor connector.



Check for continuity as indicated.

Note: If the meter does not show as specified, replace the front drive selector switch.

Voltage

The battery must be connected to test the 2WD/4WD switch voltage. See the Battery topic for more information.

Set the multimeter to read DC voltage (DCV).

Touch the black meter lead to the negative battery terminal and touch the red meter lead to the brown/blue wire in the harness side of the connector. With the ignition switch in the ON position the battery voltage must show.

If the battery voltage doesn't show correctly inspect the 30 amp fuse and battery connections.

2WD/4WD Actuator Inspection

NOTE: With the engine stopped and the ignition switch in the ON position, a momentary "whirring" sound must be noticeable each time the selector switch is moved to 2WD and 4WD. Test the switch, 30 amp fuse, and wiring connections prior to testing the actuator.

Set the multimeter to read DC voltage (DCV).

1. Select the 2WD position on the front drive selector switch; then disconnect the connector on the actuator wiring harness.

2. With the ignition switch in the OFF Position, connect the black tester lead to the black wire in the supply harness; then connect the red tester lead to the brown/blue wire in the supply harness.

3. Turn the ignition switch to the ON position The meter must show 12 DC volts.

4. Connect the red tester lead to the white/blue wire in the supply harness. The meter must show 12 DC volts.

5. Select the 4WD position on the front drive selector switch, then connect the red tester lead to the white/blue wire in the supply harness. The meter must show 0 DC volts.

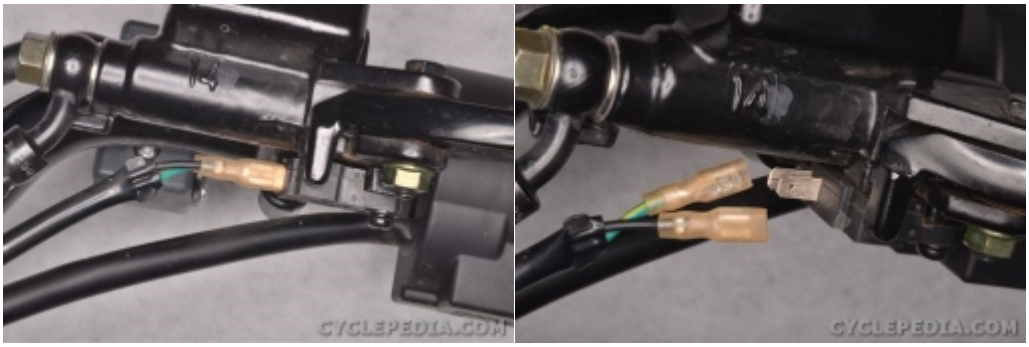
Note: the 4WD icon must show on the display.

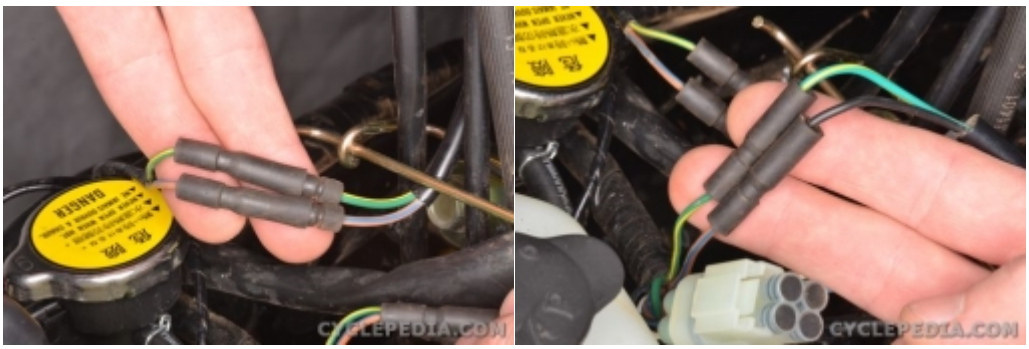
6. Connect the red tester lead to the brown/blue wire in the supply harness. The meter must show 12 DC volts.

To remove the actuator see the Differential Disassembly topic.

Brake Light Switches

Test the front and rear brake light switches in the same manner. Use a digital multimeter to check for continuity.





Test the front and rear brake light switches in the same manner. Use a digital multimeter to check for continuity.

Check for continuity between the brake light switch connectors. There should be continuity when the lever is pulled and none when released.

To replace the handlebar brake light switches see the Master Cylinders topic. To replace the pedal brake light switch see the Brake Pedal and Master Cylinder topic.

Wiring Diagrams

You will need Adobe's Free PDF Viewer to view these PDF files. Visit http://www.adobe.com

MXU500i - Wiring Diagram

MXU700i - Wiring Diagram