2014 Polaris Sportsman® 570 EFI
Service Manual

FOREWORD

The information printed within this publication includes the latest product information at time of print. The most recent version of this Service Manual is available in electronic format at www.polarisdealers.com.

This Service Manual is designed primarily for use by certified Polaris Master Service Dealer® technicians in a properly equipped shop and should be kept available for reference. All references to left and right side of the vehicle are from the operator's perspective when seated in a normal riding position.

Some procedures outlined in this manual require a sound knowledge of mechanical theory, tool use, and shop procedures in order to perform the work safely and correctly. Technicians should read the text and be familiar with the service procedures before starting any repair. Certain procedures require the use of special tools. Use only the proper tools as specified. If you have any doubt as to your ability to perform any of the procedures outlined in this Service Manual, contact an authorized dealer for service.

We value your input and appreciate any assistance you can provide in helping make these publications more useful. Please provide any feedback you may have regarding this manual. Authorized dealers can submit feedback using 'Ask Polaris'. Click on 'Ask Polaris', and then click on 'Service Manual / Service Literature Question'.

Consumers, please provide your feedback in writing to: Polaris Industries Inc. ATTN: Service Publications Department, 2100 Hwy 55, Medina, MN 55340.

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UNDERSTANDING SAFETY LABELS AND DIRECTIONS

Throughout this manual, important information is brought to your attention by the following symbols:

⚠ WARNING

SAFETY ALERT WARNING indicates a potential hazard that may result in severe injury or death to the operator, bystander or person(s) inspecting or servicing the vehicle.

⚠ CAUTION

SAFETY ALERT CAUTION indicates a potential hazard that may result in minor personal injury or damage to the vehicle.

CAUTION

CAUTION indicates special precautions that must be taken to avoid vehicle damage or property damage.

NOTE:

NOTE provides key information by clarifying instructions.

IMPORTANT:

IMPORTANT provides key reminders during disassembly, assembly and inspection of components.

TRADEMARKS

POLARIS ACKNOWLEDGES THE FOLLOWING PRODUCT(S) MENTIONED IN THIS MANUAL:

Loctite, Registered Trademark of the Loctite Corporation

Nyogel, Trademark of Wm. F. Nye Co.

Fluke, Registered Trademark of John Fluke Mfg. Co.

Mity-Vac, Registered Trademark of Neward Enterprises, Inc.

Torx, Registered Trademark of Textron

Hilliard, Trademark of the Hilliard Corporation

Warn, Trademark of Warn Industries

FOX, Registered Trademark of FOX RACING SHOX

RydeFX, Registered Trademark of ArvinMeritor

Some Polaris factory publications can be downloaded from www.polarisindustries.com, purchased from www.purepolaris.com or by contacting the nearest Polaris dealer.

CHAPTER 1
GENERAL INFORMATION

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VEHICLE IDENTIFICATION

Model Number Designation

Example: A14KA09AD

GROUP	MODEL YEAR		CHASSIS	DRIVE-LINE	ENGINE / MOTOR CODE		CATEGORY	OPTION	REGION
1st	2nd	3rd	4th*	5th*	6th*	7th*	8th*	9th**	10th
A	1	4	K	A	0	9	A	D	

* = digits that would transfer to 17 digit VIN and are used in digits 4-8 respectively
** = 9th digit will be used on color/featured versions of models (not including the base)
First 3 digits and 9th digit are used in model number only. They are not used with the 17 digit VIN.
Digits 1 through 8 determine Digital Wrench calibration.

Vehicle Identification Number (VIN) Designation

Example: 4XAKA09A0E3000000

WORLD MFG. ID			VEHICLE DESCRIPTORS						VEHICLE IDENTIFIERS							
			CHASSIS	DRIVELINE	ENGINE SIZE	ENGINE MODIFIER	CATEGORY	CHECK DIGIT	MODEL YEAR *	MFG. LOCATION	INDIVIDUAL SERIAL NO.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
4	X	A	K	A	0	9	A	0	E	3	0	0	0	0	0	0

* Model Year: A = 2010; B = 2011; C = 2012; D = 2013; E = 2014

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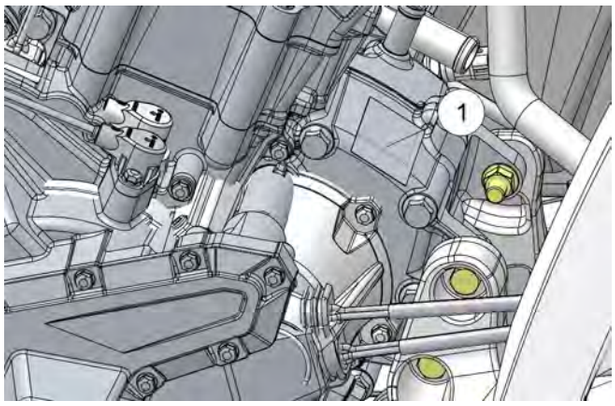
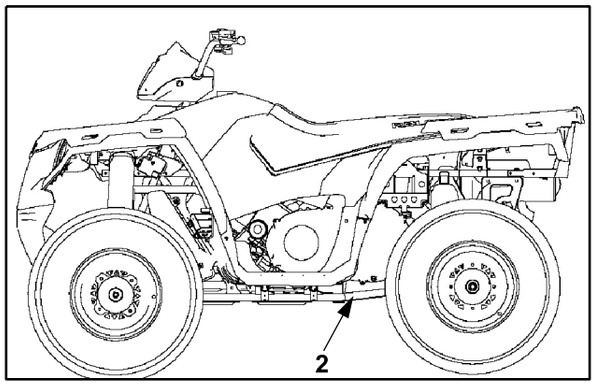
Vehicle and Engine Serial Numbers

The machine model number and serial number are important for vehicle identification. Be sure to refer to the engine model number and serial number whenever corresponding about an engine. This information can be found on the sticker applied to the top side of the crankcase (1).



The vehicle serial number is stamped on the frame on all models (2).



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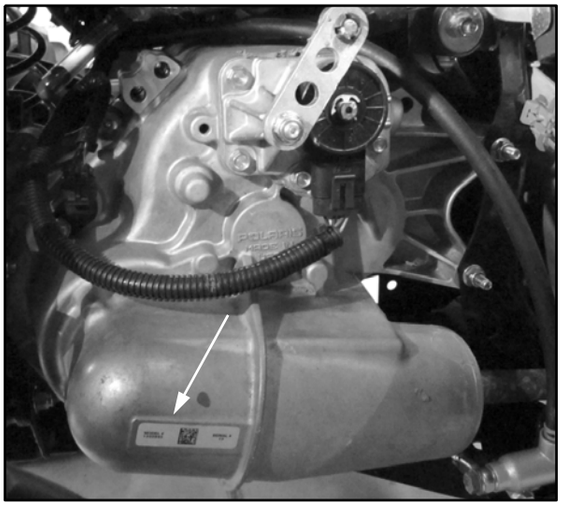
Transmission I.D. Location

The Transmission I. D. number is located on the RH side of the transmission case; visible from the RH side of the vehicle.



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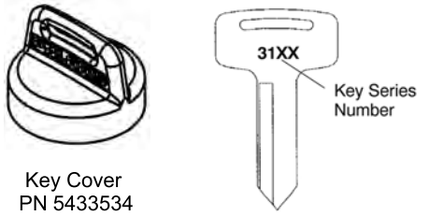
VEHICLE INFORMATION

Publication Part Numbers

YEAR	MODEL	MODEL NO.	OWNER'S MANUAL PN	PARTS MANUAL PN
2014	Sportsman 570	A14MH57AA, AC, AD, FA	9924113	9924637
2014	Sportsman 570 EPS	A14MH5EAA, AC, AJ	9924113	9924640
2014	Sportsman 570 Forest	A14MH57FA, FJ	9924299	9924638
2014	Sportsman 570 EPS Forest	A14MH5EFJ	9924299	9924642
2014	Sportsman Touring 570	A14DH57AA, AJ	9924134	9924605
2014	Sportsman 570 HD INT'L	A14MH57TD	9924113	9924639
2014	Sportsman Touring 570 INT'L	A14DH57FJ	9924134	9924607

Replacement Keys

Replacement keys can be made from the original key. To identify which series the key is, take the first two digits on the original key and refer to the chart to the right for the proper part number. Should both keys become lost, ignition switch replacement is required.



Series #	Part Number
20	4010278
21	4010278
22	4010321
23	4010321
27	4010321
28	4010321
31	4110141
32	4110148
67	4010278
68	4010278

Special Tools

Special tools may be required while servicing this vehicle. Some of the tools listed or depicted are mandatory, while other tools may be substituted with a similar tool, if available. Polaris recommends the use of Polaris Special Tools when servicing any Polaris product. Dealers may order special tools through Polaris' official tool supplier, Bosch Automotive Service Solutions, by phone at 1-800-328-6657 or on-line at http://polaris.service-solutions.com /.

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VEHICLE SPECIFICATIONS

2014 Sportsman 570 EFI / EPS

MODEL NUMBER:
A14MH57AA, AC, AD, TD
A14MH5EAA, AC, AJ

SPORTSMAN 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Gross Vehicle Weight	1200 lbs. (544 kg)
Maximum Weight Capacity	485 lbs. (220 kg) (operator, cargo, accessories)
Dry Weight	702 lbs. (318.4 kg) (570 EFI) 713 lbs. (323.4 kg) (570 EPS)
Fuel Capacity	4.5 gal. (17 l)
Engine Oil Capacity	2 qts. (1.9 l)
Transmission Oil Capacity	32 oz. (948 ml)
Demand Drive Fluid Capacity	9 oz. (265 ml)
Coolant Capacity	2.7 qts. (2.5 l)
Front Rack/Box Capacity	90 lbs. (40.8 kg)
Rear Rack/Box Capacity	180 lbs. (81.6 kg)
Receiver Hitch Tongue Capacity	120 lbs./54.4 kg Rear rack capacity and tongue weight not to exceed 180 lbs./82 kg
Hitch Towing Rating	1225 lbs. (555.7 kg)
Unbraked Trailer Towing Capacity*	1786 lbs. (810 kg)
Overall Length/Width/ Height	83 in. (211 cm) / 48 in. (122 cm) / 48 in. (122 cm)
Wheelbase	50.5 in. (128.3 cm)
Ground Clearance	11 in. (28 cm)
Minimum Turning Radius	65 in. (165 cm) unloaded
Engine	Dual overhead cam, 4 valve 4 stroke single cylinder
Displacement	567 cc

SPORTSMAN 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Bore x Stroke	99mm x 73.6mm
Alternator Output	560 W @ 7000 RPM
Idle RPM	1200 ± 100
Compression Ratio	10:1
Starting System	Electric
Fuel System	Electronic Fuel Injection
Ignition System	ECU
Spark Plug / Gap	RG6YC / (0.7-0.8 mm)
Lubrication System	Wet Sump
Driving System Type	Automatic PVT (POLARIS Variable Transmission)
Front Suspension	MacPherson strut with 8.2" (21 cm) travel
Rear Suspension	Progressive rate with 9.5" (24 cm) travel
Shift Type	H/L/N/R/P
Gear Reduction, Low	23.91:1
Gear Reduction, Reverse	21.74:1
Gear Reduction, Forward	9.75:1
Drive Ratio, Front	3.82:1
Tires/Pressure, Front	25x8-12 / 5 psi (34.5 kPa)
Tires/Pressure, Rear	25x10-12 / 5 psi (34.5 kPa) 25x11-12 / 5 psi (34.5 kPa) (LE models)
Brakes, Front/Rear	Single-Control Hydraulic Disc
Brake, Auxiliary	Foot-Activated Hydraulic Disc
Brake, Parking	Hydraulic lock, all wheel
Headlight	1 Single Beam on Headlight Pod (50 watt) 2 Single Beam on Bumper (50 watt)
Taillights	8.26 watts
Brake Light	26.9 watts
Instrument Cluster	LCD

* Based on EU Directive 76/432/EC

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2014 Sportsman Forest 570 EFI / EPS

MODEL NUMBER:
A14MH57FA, FJ
A14MH5EFJ

SPORTSMAN FOREST 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Maximum Weight Capacity	485 lbs. (220 kg) (operator, cargo, accessories)
Dry Weight	720 lbs. (327 kg) +/- 7%, based on configuration 731 lbs. (332 kg) (EPS) +/- 7%, based on configuration
Fuel Capacity	4.5 gal. (17 l)
Engine Oil Capacity	2 qts. (1.9 l)
Transmission Oil Capacity	32 oz. (948 ml)
Demand Drive Fluid Capacity	9 oz. (265 ml)
Coolant Capacity	2.7 qts. (2.5 l)
Front Rack/Box Capacity	90 lbs. (40.8 kg)
Rear Rack/Box Capacity	180 lbs. (81.6 kg)
Receiver Hitch Tongue Capacity	120 lbs./54.4 kg Rear rack capacity and tongue weight not to exceed 180 lbs./82 kg
Hitch Towing Rating	1225 lbs. (555.7 kg)
Unbraked Trailer Towing Capacity*	1786 lbs. (810 kg)
Overall Length/Width/ Height	83 in. (211 cm) / 48 in. (122 cm) / 48 in. (122 cm)
Wheelbase	50.5 in. (128.3 cm)
Ground Clearance	11 in. (28 cm)
Minimum Turning Radius	65 in. (165 cm) unloaded
Engine	Dual overhead cam, 4 valve 4 stroke single cylinder
Displacement	567 cc

SPORTSMAN FOREST 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Bore x Stroke	99mm x 73.6mm
Alternator Output	560 W @ 7000 RPM
Idle RPM	1200 ± 100
Compression Ratio	10:1
Starting System	Electric
Fuel System	Electronic Fuel Injection
Ignition System	ECU
Spark Plug / Gap	RG6YC / 0.7-0.8 mm
Lubrication System	Wet Sump
Driving System Type	Automatic PVT (POLARIS Variable Transmission)
Front Suspension	MacPherson strut with 8.2" (21 cm) travel
Rear Suspension	Progressive rate with 9.5" (24 cm) travel
Shift Type	H/L/N/R/P
Gear Reduction, Low	23.91:1
Gear Reduction, Reverse	21.74:1
Gear Reduction, Forward	9.75:1
Drive Ratio, Front	3.82:1
Tires/Pressure, Front	Off Road Style, Deep Tread Design 25x8-12 / 5 psi (34.5 kPa)
Tires/Pressure, Rear	Off Road Style, Deep Tread Design 25x10-12 / 5 psi (34.5 kPa)
Brakes, Front/Rear	Single-Control Hydraulic Disc
Brake, Auxiliary	Foot-Activated Hydraulic Disc
Brake, Parking	Hydraulic lock, all wheel
Hitch	Rear mounting for attachment of coupling devices
Winch	Front permanent installed winch with 2500 lbs. (1125 kg) capacity
Headlight	1 Single Beam on Headlight Pod (50 watt) 2 Single Beam on Bumper (50 watt)
Taillights	8.26 watts
Brake Light	26.9 watts
Instrument Cluster	LCD

* Based on EU Directive 76/432/EC

2014 Sportsman Touring 570 EFI

MODEL NUMBER:
A14DM57AA, AJ

SPORTSMAN TOURING 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Gross Vehicle Weight	1200 lbs. (544 kg)
Maximum Weight Capacity	575 lbs. (261 kg) (includes operator, passenger, cargo, accessories)
Dry Weight	728 lbs. (330.2 kg) (570 EFI) 739 lbs. (335.2 kg) (570 EPS)
Fuel Capacity	4.5 gal. (17 l)
Engine Oil Capacity	2 qts. (1.9 l)
Transmission Oil Capacity	32 oz. (948 ml)
Demand Drive Fluid Capacity	9 oz. (265 ml)
Coolant Capacity	2.7 qts. (2.5 l)
Front Rack/Box Capacity	90 lbs. (40.8 kg)
Rear Rack/Box Capacity	180 lbs. (81.6 kg)
Receiver Hitch Tongue Capacity	120 lbs./54.4 kg Rear rack capacity and tongue weight not to exceed 180 lbs./82 kg
Hitch Towing Rating	1225 lbs. (555.7 kg)
Unbraked Trailer Towing Capacity*	1786 lbs. (810 kg)
Overall Length/Width/ Height	86 in. (218.4 cm) / 48 in. (122 cm) / 48 in. (122 cm)
Wheelbase	56 in. (142.2 cm)
Ground Clearance	11 in. (28 cm)
Minimum Turning Radius	82 in. (208.3 cm) unloaded
Engine	Dual overhead cam, 4 valve 4 stroke single cylinder
Displacement	567 cc
Bore x Stroke	99mm x 73.6mm
Alternator Output	560 W @ 7000 RPM

SPORTSMAN TOURING 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Idle RPM	1200 ± 100
Compression Ratio	10:1
Starting System	Electric
Fuel System	Electronic Fuel Injection
Ignition System	ECU
Spark Plug / Gap	RG6YC / 0.7-0.8 mm
Lubrication System	Wet Sump
Driving System Type	Automatic PVT (POLARIS Variable Transmission)
Front Suspension	MacPherson strut with 8.2" (21 cm) travel
Rear Suspension	Progressive rate with 9.5" (24 cm) travel
Shift Type	H/L/N/R/P
Gear Reduction, Low	23.91:1
Gear Reduction, Reverse	21.74:1
Gear Reduction, Forward	9.75:1
Drive Ratio, Front	3.82:1
Tires/Pressure, Front	25x8-12 / 5 psi (34.5 kPa)
Tires/Pressure, Rear	25x10-12 / 5 psi (34.5 kPa) 25x11-12 / 5 psi (34.5 kPa) (LE models)
Brakes, Front/Rear	Single-Control Hydraulic Disc
Brake, Auxiliary	Foot-Activated Hydraulic Disc
Brake, Parking	Hydraulic lock, all wheel
Headlight	1 Single Beam on Headlight Pod (50 watt) 2 Single Beam on Bumper (50 watt)
Taillights	8.26 watts
Brake Light	26.9 watts
Instrument Cluster	LCD

* Based on EU Directive 76/432/EC

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2014 Sportsman Touring 570 EFI (Intl.)

MODEL NUMBER:
A14DH57FJ

SPORTSMAN TOURING 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Gross Vehicle Weight	1200 lbs. (544 kg)
Maximum Weight Capacity	575 lbs. (261 kg) (includes operator, passenger, cargo, accessories)
Dry Weight	728 lbs. (330.2 kg) (570 EFI) 739 lbs. (335.2 kg) (570 EPS)
Fuel Capacity	4.5 gal. (17 l)
Engine Oil Capacity	2 qts. (1.9 l)
Transmission Oil Capacity	32 oz. (948 ml)
Demand Drive Fluid Capacity	9 oz. (265 ml)
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Hitch Towing Rating	1225 lbs. (555.7 kg)
Unbraked Trailer Towing Capacity*	1786 lbs. (810 kg)
Overall Length/Width/ Height	86 in. (218.4 cm) / 48 in. (122 cm) / 48 in. (122 cm)
Wheelbase	56 in. (142.2 cm)
Ground Clearance	11 in. (28 cm)

SPORTSMAN TOURING 570 EFI / EPS	
CATEGORY	**DIMENSION / CAPACITY**
Minimum Turning Radius	82 in. (208.3 cm) unloaded
Engine	Dual overhead cam, 4 valve 4 stroke single cylinder
Displacement	567 cc
Bore x Stroke	99mm x 73.6mm
Alternator Output	560 W @ 7000 RPM
Idle RPM	1200 ± 100
Compression Ratio	10:1
Starting System	Electric
Fuel System	Electronic Fuel Injection
Ignition System	ECU
Spark Plug / Gap	RG6YC / 0.7-0.8 mm
Lubrication System	Wet Sump
Driving System Type	Automatic PVT (POLARIS Variable Transmission)
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Rear Suspension	Progressive rate with 9.5" (24 cm) travel
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Gear Reduction, Forward	9.75:1
Drive Ratio, Front	3.82:1
Tires/Pressure, Front	25x8-12 / 5 psi (34.5 kPa)
Tires/Pressure, Rear	25x10-12 / 5 psi (34.5 kPa) 25x11-12 / 5 psi (34.5 kPa) (LE models)
Brakes, Front/Rear	Single-Control Hydraulic Disc
Brake, Auxiliary	Foot-Activated Hydraulic Disc
Brake, Parking	Hydraulic lock, all wheel
Headlight	1 Single Beam on Headlight Pod (50 watt) 2 Single Beam on Bumper (50 watt)
Taillights	8.26 watts
Brake Light	26.9 watts
Instrument Cluster	LCD

* Based on EU Directive 76/432/EC

CLUTCHING SPECIFICATIONS

Clutching Chart

ALTITUDE		SHIFT	DRIVE CLUTCH SPRING	DRIVEN CLUTCH SPRING	HELIX*
Meters (Feet)	0-1800 (0-6000)	25–52G PN 5632409	Black PN 7043594	Non-EBS: Black PN 7041782 EBS: Red PN 3234451	EBS PN 3234356 Non-EBS PN 5132344
	1800–3700 (6000–12000)	25–48 PN 5632408	Black PN 7043594	Non-EBS: Black PN 7041782 EBS: Red PN 3234451	EBS PN 3234356 Non-EBS PN 5132344

*EBS models require no helix/spring adjustment

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MISC. SPECIFICATIONS AND CHARTS

Conversion Table

UNIT OF MEASURE	MULTIPLIED BY	CONVERTS TO
ft-lbs	x 12	= in-lbs
in-lbs	x 0.0833	= ft-lbs
ft-lbs	x 1.356	= Nm
in-lbs	x 0.0115	= kg-m
Nm	x 0.7376	= ft-lbs
kg-m	x 7.233	= ft-lbs
kg-m	x 86.796	= in-lbs
kg-m	x 10	= Nm
inch	x 25.4	= mm
mm	x 0.03937	= inch
inch	x 2.54	= cm
mile (mi)	x 1.6	= km
km	x 0.6214	= mile
ounces (oz)	x 28.35	= grams (g)
fluid ounces (fl oz)	x 29.57	= cubic centimeters (cc)
cubic centimeters (cc)	x .03381	= fluid ounces
grams (g)	x 0.035	= ounces
pounds (lb)	x 0.454	= kg
kilogram (kg)	x 2.2046	= lbs
cubic inches (cu in)	x 16.387	= cc
cubic centimeters (cc)	x 0.061	= cubic inches
US quarts	x 0.946	= liters (L)
liters (L)	x 1.057	= US quarts
US gallons	x 3.785	= liters (L)
liters (L)	x 0.264	= US gallons
PSI	x 6.895	= kilopascals (kPa)
kilopascals (kPa)	x 0.145	PSI
π (3.14) x Radius² x Height =		= cylinder volume
°C to °F:	9/5 (°C + 32)	= °F
°F to °C:	5/9 (°F − 32)	= °C

Standard Bolt Torque Specification

BOLT SIZE	GRADE 2 FT. LBS. (NM)	GRADE 5 FT. LBS. (NM)	GRADE 8 FT. LBS. (NM)
1/4-20	5 (7)	8 (11)	12 (16)
1/4-28	6 (8)	10 (14)	14 (19)
5/16-18	11 (15)	17 (23)	25 (35)
5/16-24	12 (16)	19 (26)	29 (40)
3/8-16	20 (27)	30 (40)	45 (62)
3/8-24	23 (32)	35 (48)	50 (69)
7/16-14	30 (40)	50 (69)	70 (97)
7/16-20	35 (48)	55 (76)	80 (110)
1/2-13	50 (69)	75 (104)	110 (152)
1/2-20	55 (76)	90 (124)	120 (166)

Metric Bolt Torque Specification

BOLT SIZE	GRADE				
	4.6	4.8	8.8 / 8.9	10.9	12.9
	FT.— LBS. (NM) DRY THREADS				
M3	.3 (.5)	.5 (.7)	1 (1.3)	1.5 (2)	1.5 (2)
M4	.8 (1.1)	1 (1.5)	2 (3)	3 (4.5)	4 (5)
M5	1.5 (2.5)	2 (3)	4.5 (6)	6.5 (9)	7.5 (10)
M6	3 (4)	4 (5.5)	7.5 (10)	11 (15)	13 (18)
M8	7 (9.5)	10 (13)	18 (25)	26 (35)	33 (45)
M10	14 (19)	18 (25)	37 (50)	55 (75)	63 (85)
M12	26 (35)	33 (45)	63 (85)	97 (130)	11 (150)
M14	37 (50)	55 (75)	103 (140)	151 (205)	177 (240)
M16	59 (80)	85 (115)	159 (215)	232 (315)	273 (370)
M18	81 (110)	118 (160)	225 (305)	321 (435)	376 (510)

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SAE Tap / Drill Sizes

THREAD SIZE	DRILL SIZE	THREAD SIZE	DRILL SIZE
#0–80	3/64	1/2–13	27/64
#1–64	53	1/2–20	29/64
#1–72	53	9/16–12	31/64
#2–56	51	9/16–18	33/64
#2–64	50	5/8–11	17/32
#3–48	5/64	5/8–18	37/64
#3–56	45	3/4–10	21/32
#4–40	43	3/4–16	11/16
#4–48	42	7/8–9	49/64
#5–40	38	7/8–14	13/16
#5–44	37	1–8	7/8
#6–32	36	1–12	59/64
#6–40	33	1 1/8–7	63/64
#8–32	29	1 1/8–12	1 3/64
#8–36	29	1 1/4–7	1 7/64
#10–24	24	1 1/4–12	1 11/64
#10–32	21	1 1/2–6	1 11/32
#12–24	17	1 1/2–12	1 27/64
#12–28	4.6 mm	1 3/4–5	1 9/16
1/4–20	7	1 3/4–12	1 43/64
1/4–28	3	2–4 1/2	1 25/32
5/16–18	F	2–12	1 59/64
5/16–24	I	2 1/4–4 1/2	2 1/32
3/8–16	O	2 1/2–4	2 1/4
3/8–24	Q	2 3/4–4	2 1/2
7/16–14	U	3–4	2 3/4
7/16–20	25/64		

Metric Tap / Drill Sizes

TAP SIZE	DRILL SIZE	DECIMAL	NEAREST FRACTION
3 x .50	#39	0.0995	3/32
3 x .60	3/32	0.0937	3/32
4 x .70	#30	0.1285	1/8
4 x .75	1/8	0.125	1/8
5 x .80	#19	0.166	11/64
5 x .90	#20	0.161	5/32
6 x 1.00	#9	0.196	13/64
7 x 1.00	16/64	0.234	15/64
8 x 1.00	J	0.277	9/32
8 x 1.25	17/64	0.265	17/64
9 x 1.00	5/16	0.3125	5/16
9 x 1.25	5/16	0.3125	5/16
10 x 1.25	11/32	0.3437	11/32
10 x 1.50	R	0.339	11/32
11 x 1.50	3/8	0.375	3/8
12 x 1.50	13/32	0.406	13/32
12 x 1.75	13/32	0.406	13/32

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Decimal Equivalents

FRACTION	DECIMAL	MM TO INCHES
1/64	0.0156″	
1/32	0.0312″	1 mm = 0.0394″
3/64	0.0469″	
1/16	0.0625″	
5/64	0.0781″	2 mm = 0.0787″
3/32	0.0938″	
7/64	0.1094″	3 mm = 0.1181″
1/8	0.1250″	
9/64	0.1406″	
5/32	0.1563″	4 mm = 0.1575″
11/64	0.1719″	
3/16	0.1875″	5 mm = 0.1969″
13/64	0.2031″	
7/32	0.2188″	
15/64	0.2344″	6 mm = 0.2362″
1/4	0.25″	
17/64	0.2656″	7 mm = 0.2756″
9/32	0.2813″	
19/64	0.2969″	
5/16	0.3125″	8 mm = 0.3150″
21/64	0.3281″	
11/32	0.3438″	9 mm = 0.3543″
23/64	0.3594″	
3/8	0.375″	
25/64	0.3906″	10 mm = 0.3937″
13/32	0.4063″	
27/64	0.4219″	11 mm = 0.4331″
7/16	0.4375″	
29/64	0.4531″	
15/32	0.4688″	12 mm = 0.4724″
31/64	0.4844″	
1/2	0.500″	13 mm = 0.5118″
33/64	0.5156″	
17/32	0.5313″	
35/64	0.5469″	14 mm = 0.5512″
9/16	0.5625″	
37/64	0.5781″	15 mm = 0.5906″
19/32	0.5938″	
39/64	0.6094″	
5/8	0.625″	16 mm = 0.6299″

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FRACTION	DECIMAL	MM TO INCHES
41/64	0.6406″	
21/32	0.6563″	17 mm = 0.6693″
43/64	0.6719″	
11/16	0.6875″	
45/64	0.7031″	18 mm = 0.7087″
23/32	0.7188″	
47/64	0.7344″	19 mm = 0.7480″
3/4	0.750″	
49/64	0.7656″	
25/32	0.7813″	20 mm = 0.7874″
51/64	0.7969″	
13/16	0.8125″	21 mm = 0.8268″
53/64	0.8281″	
27/32	0.8438″	
55/64	0.8594″	22 mm = 0.8661″
7/8	0.875″	
57/64	0.8906″	23 mm = 0.9055″
29/32	0.9063″	
59/64	0.9219″	
15/16	0.9375″	24 mm = 0.9449″
61/64	0.9531″	
31/32	0.9688″	25 mm = 0.9843″
63/64	0.9844″	
1	1.000″	

CHAPTER 2
MAINTENANCE

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SPECIAL TOOLS

Bosch Automotive Service Solutions- 1-800-328-6657 or
http://polaris.service-solutions.com

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MAINTENANCE

INSPECTION / MAINTENANCE INTERVALS

Pre-Ride / Daily Inspection

Perform the following pre-ride inspection daily, and when servicing the vehicle at each scheduled maintenance.

- Tires - check tire condition and air pressures
- Fuel and oil - fill both to their proper level; Do not overfill
- All brakes - check operation and adjustment (includes auxiliary brake)
- Throttle -check for free operation
- Headlight/Taillight/Brakelight - check operation of all indicator lights and switches
- Engine stop switch - check for proper function
- Wheels - check for loose wheel nuts and axle nuts; check to be sure axle nuts are secured by cotter pins
- Air cleaner element - check for dirt or water; clean or replace
- Steering - check for free operation, noting any unusual looseness in any area
- Loose parts - visually inspect vehicle for any damaged or loose nuts, bolts or fasteners
- Engine coolant - check for proper level at the recovery bottle

Break-In Period

The break-in period consists of the first 25 hours of operation, or the time it takes to use 14 gallons (53 liters) of fuel. Careful treatment of a new engine and drive components will result in more efficient performance and longer life for these components.

- Drive vehicle slowly at first while varying the throttle position. Do not operate at sustained idle.
- Pull only light loads.
- Perform regular checks on fluid levels and other areas outlined on the daily pre-ride inspection checklist.
- Change both the engine oil and filter after 25 hours or one month.
- See “Owner’s Manual” for additional break-in information.

Periodic Maintenance Chart

Periodic Maintenance Overview

Careful periodic maintenance will help keep your vehicle in the safest, most reliable condition. Inspection, adjustment and lubrication of important components are explained in the periodic maintenance chart.

Inspect, clean, lubricate, adjust and replace parts as necessary. When inspection reveals the need for replacement parts, use genuine Polaris parts available from your Polaris dealer.

NOTE: Service and adjustments are critical. If you're not familiar with safe service and adjustment procedures, have a qualified dealer perform these operations.

Maintenance intervals in the following chart are based upon average riding conditions and an average vehicle speed of approximately 10 miles per hour. Vehicles subjected to severe use must be inspected and serviced more frequently.

Severe Use Definition

- Frequent immersion in mud, water or sand
- Racing or race-style high RPM use
- Prolonged low speed, heavy load operation
- Extended idle
- Short trip cold weather operation

Pay special attention to the oil level. A rise in oil level during cold weather can indicate contaminants collecting in the oil sump or crankcase. Change oil immediately if the oil level begins to rise. Monitor the oil level, and if it continues to rise, discontinue use and determine the cause or see your dealer.

Maintenance Chart Key

SYMBOL	DESCRIPTION
►	Perform these operations more often for vehicles subjected to severe use.
E	Emission-related Control System Service (California) Failure to conduct this maintenance will not void the emissions warranty but may affect emissions
D	Have an authorized POLARIS dealer perform these services.

SEVERE USE ITEM: *Severe Use is defined as frequent vehicle immersion in mud, water or sand, racing or race-style high rpm use, prolonged low speed - heavy load operation or extended idle. More preventative maintenance is required under these conditions. Fluid changes, cable and chassis lubrication are required more frequently. For engine oil, short trip cold weather riding also constitutes severe use. Pay special attention to oil level. A rising oil level in cold weather can indicate contaminants collecting in the oil sump or crankcase. Change oil immediately and monitor level. If oil level begins to rise, discontinue use and determine cause.*

NOTE: Inspection may reveal the need for replacement parts. Always use genuine Polaris parts.

⚠ WARNING

Improperly performing the procedures marked with a ■ could result in component failure and lead to serious injury or death. Have an authorized Polaris dealer perform these services.

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Periodic Maintenance Chart

ITEM		MAINTENANCE INTERVAL (WHICHEVER COMES FIRST) HOURS	CALENDAR	MILES (KM)	REMARKS
	Steering	-	Pre-Ride	-	Make adjustments as needed.
	Front-suspension	-	Pre-Ride	-	
	Rear-suspension	-	Pre-Ride	-	
	Tires	-	Pre-Ride	-	
	Brake fluid level	-	Pre-Ride	-	
	Brake lever / pedal travel	-	Pre-Ride	-	
	Brake systems	-	Pre-Ride	-	
	Wheels /fasteners	-	Pre-Ride	-	
	Frame fasteners	-	Pre-Ride	-	
	Engine Oil Level	-	Pre-Ride	-	
	Winch (if equipped)	-	Pre-Ride	-	
► E	Air filter, pre-filter	-	Pre-Ride	-	Inspect; clean often
►	Air box sediment tube	-	Daily	-	Drain deposits when visible
	Coolant	-	Daily	-	Check level daily, change coolant every 2 years
	Power Steering unit	-	Daily	-	Inspect daily; clean often
	Head lamp / tail lamp / worklight	-	Daily	-	Check operation; apply dielectric grease if replacing
► E	Air filter, main element	-	Weekly	-	Inspect; replace as needed
	Recoil housing	-	Weekly	100 (160)	Drain water as needed,check often if operating in wet conditions
► D	Brake pad wear	10 H	Monthly	100 (160)	Inspect periodically
	Battery	20 H	Monthly	200 (320)	Check terminals; clean; test
► E	Engine breather filter (if equipped)	25 H	Monthly	250 (400)	Inspect; replace if necessary
► E	Engine oil change (break-in)	25 H	Monthly	250 (400)	Perform a break-in oil and filter change
►	Demand drive fluid	25 H	Monthly	250 (400)	Initial fluid level inspection; Change yearly*
►	Rear gearcase oil	25 H	Monthly	250 (400)	Initial fluid level inspection; Change yearly
►	Transmission fluid	25 H	Monthly	250 (400)	Initial fluid level inspection; Change yearly
►	General lubrication	50 H	3 M	500 (800)	Lubricate all grease fittings, pivots, cables, etc.
D E	Throttle Cable/ TRS Switch	50 H	6 M	300 (500)	Inspect; adjust; lubricate; replace if necessary
E	Air intake ducts/ flange	50 H	6 M	300 (500)	Inspect ducts for proper sealing/air leaks
	Drive belt	50 H	6 M	500 (800)	
►	Cooling system	50 H	6 M	1000 (1600)	Inspect coolant strength seasonally; pressure test system yearly
►	Engine oil change	100 H	6 M	1000 (1600)	Change the oil and filter
►	Oil lines and fasteners	100 H	6 M	1000 (1600)	Inspect for leaks and loose

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ITEM		MAINTENANCE INTERVAL (WHICHEVER COMES FIRST) HOURS	CALENDAR	MILES (KM)	REMARKS
►	Demand drive fluid (normal use)	100 H	12 M	1000 (1600)	Change fluid
►	Rear gearcase oil	100 H	100 H	1000 (1600)	Change fluid
►	Transmission oil	100 H	12 M	1000 (1600)	Change fluid
D E	Valve clearance	100 H	12 M	1000 (1600)	Inspect; adjust
D E	Fuel System	100 H	12 M	600 (1000)	Check for leaks at fuel cap, fuel line / rail, and fuel pump; Replace lines every 2 years
D E	Fuel Filter	100 H	12 M	1000 (1600)	Replace yearly
►	Radiator (if applicable)	100 H	12 M	1000 (1600)	Inspect; clean external
►	Cooling hoses (if applicable)	100 H	12 M	1000 (1600)	Inspect; clean external surfaces
►	Engine mounts	100 H	12 M	1000 (1600)	Inspect
	Exhaust muffler / pipe	100 H	12 M	1000 (1600)	Inspect
D E	Spark plug	100 H	12 M	1000 (1600)	inspect; replace as needed
►	Wiring	100 H	12 M	1000 (1600)	Inspect for wear, routing, security; apply dielectric grease to connectors subjected to water, mud, etc.
D	Clutches (drive and driven)	100 H	12 M	1000 (1600)	Inspect; clean; replace worn parts
D	Front wheel bearings	100 H	12 M	1000 (1600)	Inspect; replace as needed
D	Brake fluid	200 H	24 M	2000 (3200)	Change every two years
	Spark arrestor	300 H	36 M	3000 (4800)	Clean out
►	Shocks	500 H	12 M	-	Inspect; replace shock oil and seals (if equipped)
	Idle speed				Adjust as needed.
D	Toe adjustment	-			Inspect periodically; adjust when parts are replaced
	Headlight aim	-			Adjust as needed

► = Perform these procedures more often for vehicles subjected to severe use.
E= Emission Control System Service (California)
D = Have an authorized POLARIS dealer perform these services.

*__Service Note:__ Under extreme use, change demand drive fluid every 25 hours. *"Extreme Use" is defined as constant ADC operation on hilly or mountainous terrain, or if ADC is the primary mode of AWD operation.*

VEHICLE STORAGE

Storage Tips

Stabilize the Fuel

1. Fill the fuel tank.
2. Add POLARIS Carbon Clean Fuel Treatment or POLARIS Fuel Stabilizer. Follow the instructions on the container for the recommended amount. Carbon Clean removes water from fuel systems, stabilizes fuel and removes carbon deposits from pistons, rings, valves and exhaust systems.
3. Allow the engine to run for 15-20 minutes to allow the stabilizer to disperse through the entire fuel delivery system.

Fog the Engine

1. After stabilizing the fuel, remove the spark plugs and add 2-3 tablespoons of engine oil. To access the plug holes, use a section of clear 1/4" hose and a small plastic squeeze bottle filled with the pre-measured amount of oil.
2. Reinstall the spark plugs. Torque to specification.
3. Apply dielectric grease to the inside of the spark plug cap and reinstall the caps onto the plugs.
4. Turn the engine over several times using electric start. Oil will be forced in and around the piston rings and ring lands, coating the cylinder with a protective film of fresh oil.
5. If POLARIS fuel system additive is not used, the fuel tank, fuel lines, and injectors should be completely drained of gasoline.

Starting the engine during the storage period will disturb the protective film created by fogging and damage could occur. Never start the engine during the storage period.

Inspect and Lubricate

Inspect all cables and lubricate all areas of the vehicle as recommended in the Periodic Maintenance Chart.

Fluid Levels

Inspect the fluid levels. Add or change fluids as recommended in the Periodic Maintenance Chart.

- Demand drive unit (front gearcase)
- Rear gearcase (if equipped)
- Transmission
- Brake fluid (change every two years and any time the fluid looks dark or contaminated)
- Coolant (test strength/fill)

Oil and Filter

Change the oil and filter.

Air Filter/Air Box:

1. Inspect and clean (or replace) the pre-cleaner and air filter.
2. Clean the air box.
3. Drain the sediment tube.
4. Clean or replace the breather valve.

Battery Storage:

Refer to Chapter 10 "Electrical" for off season storage procedures.

Clean the Exterior:

Make any necessary repairs and clean the vehicle as recommended.

Storage Area/Covers:

Set the tire pressure and safely support the ATV with the tires slightly off the ground. Be sure the storage area is well ventilated. Cover the vehicle with a genuine POLARIS cover. Do not use plastic or coated materials. They do not allow enough ventilation to prevent condensation, and may promote corrosion and oxidation.

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LUBRICANTS / SERVICE PRODUCTS

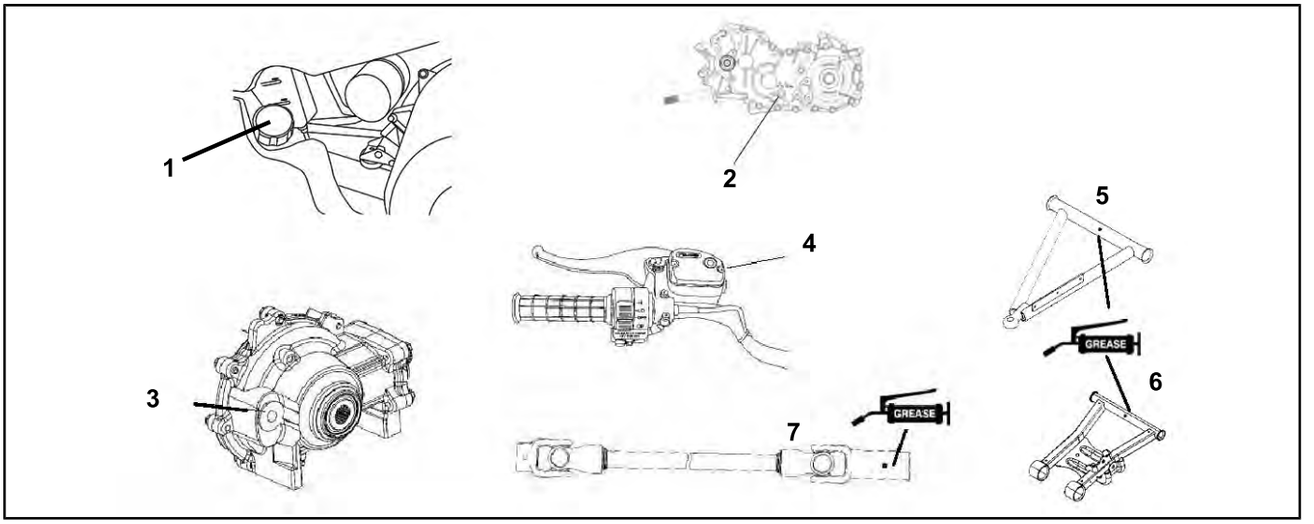
Polaris Lubricants, Maintenance and Service Products

	PART NO.	DESCRIPTION
Engine Lubricant	2870791	Fogging Oil (12 oz. Aerosol)
	2876244	PS-4 Syn. 4-Cycle Engine Oil (Quart)
	2876245	PS-4 Syn. 4-Cycle Engine Oil (Gallon / 3.8 l)
	2878920	PS-4 Extreme Duty Synthetic 10W-50 4-Cycle Oil (qt./.95 l)
	2878919	PS-4 Extreme Duty Synthetic 10W-50 4-Cycle Oil (gal./3.8 l)
Gearcase / Transmission Lubricants	2878068	AGL Gearcase Lubricant (1 Qt. / .95 l) (12 Count)
	2878069	AGL Gearcase Lubricant (1 Gal. / 3.8 l) (4 Count)
	2878070	AGL Gearcase Lubricant (2.5 Gal. / 9.5 l) (2 Count)
	2877922	Demand Drive fluid (Quart / .95 l)
	2877923	Demand Drive fluid (2.5 Gallon / 9.5 l)
	2870465	Oil Pump for 1 Gallon Jug
Coolant	2871323	60/40 Coolant (1 Gallon / 3.8 l) (6 Count)
	2871534	60/40 Coolant (Quart / .95 l) (12 Count)
Grease / Specialized Lubricants	2871312	Grease Gun Kit
	2871322	Premium All Season Grease (3 oz. cartridge) (24 Count)
	2871423	Premium All Season Grease (14 oz. cartridge) (10 Count)
	2871460	Premium Starter Grease
	2871515	U-Joint Grease (3 oz.) (24 Count)
	2871551	U-Joint Grease (14 oz.) (10 Count)
	2871329	Dielectric Grease (Nyogel™)
Miscellaneous	2871326	Premium Carbon Clean (12 oz.) (12 count)
	2870652	Fuel Stabilizer (16 oz.) (12 count)
	2872189	DOT 4 Brake Fluid (12 count)
	2871950	Loctite™ Threadlock 242 (6 ml.) (12 count)
	2871956	Loctite™ 565 Thread Sealant
	2871557	Crankcase Sealant, 3-Bond 1215 (5 oz.)
	2859044	POLARIS Battery Tender™ Charger

NOTE: Each item can be purchased separately at your local Polaris dealer.

NOTE: The number count indicated by each part number in the table above indicates the number of units that are shipped with each order.

Lubrication Components



#	ITEM	LUBE	METHOD	FREQUENCY*
1.	Engine Oil	Polaris PS-4 5W-50 4-Cycle Oil	Check oil tank dipstick and add to proper level.	Change after 1st month, 6 months, or 100 hours thereafter; Change more often (25-50 hours) in extremely dirty conditions, or short trip cold weather operation.
2.	Transmission	Polaris AGL Synthetic Gearcase Lube	Add lube to bottom fill hole.	Change annually **(B)**
3	Front Gearcase	Demand Drive	Drain as directed. Add specified quantity.	Change annually **(B)**
4.	Brake Fluid	Polaris DOT 4 Brake Fluid	Fill master cylinder reservoir to indicated level	As required, change fluid every 2 years
5.	Front A-Arm	Polaris All Season Grease	Locate fitting and grease.	Semi-annually **(A)**
6.	Rear A-Arm	Polaris All Season Grease	Locate fitting and grease	Semi-annually **(A)**
7.	Propshafts	Polaris U-Joint Grease **(C)**	Locate fitting and grease.	Semi-annually **(A)**

* Perform more often under severe use, such as operation in water and under severe loads.

(A) Semi-annually or 50 hours of operation. Refer to Maintenance Schedule for additional information. Service more often under severe conditions (i.e. operating in water or hauling heavy loads).

(B) Annually or 100 hours of operation Refer to Maintenance Schedule for additional information. Service more often under severe conditions (i.e. operating in water or hauling heavy loads). ADC gearcase fluid should be changed every 25hrs of operation in extreme use conditions (i.e. continuous operation on hilly or mountainous terrain or if ADC ‘on’ is primary mode of AWD operation).

(C) Grease conforming to NLGI No. 2, such as Polaris Premium All Season Grease, Conoco Superlube M, or Mobilgrease Special.

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FUEL SYSTEM AND AIR INTAKE

Fuel System

WARNING

* Gasoline is extremely flammable and explosive under certain conditions.
* EFI components are under high pressure. Verify system pressure has been relieved before disassembly.
* Never drain the fuel system when the engine is hot. Severe burns may result
* Do not overfill the tank. The tank is at full capacity when the fuel reaches the bottom of the filler neck. Leave room for expansion of fuel.
* Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.
* Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.
* If you get gasoline in your eyes or if you should swallow gasoline, seek medical attention immediately.
* If you spill gasoline on your skin or clothing, immediately wash with soap and water and change clothing.
* Always stop the engine and refuel outdoors or in a well ventilated area.Keep away from open flames and electrical components when removing fuel filter.

- Always stop the engine and refuel outdoors or in a well ventilated area.
- Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.
- Do not overfill the tank. Do not fill the tank neck.
- If you get gasoline in your eyes or if you swallow gasoline, seek medical attention immediately.
- If you spill gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.
- Never start the engine or let it run in an enclosed area. Engine exhaust fumes are poisonous and can result loss of consciousness or death in a short time.
- **Never drain the system when the engine is hot. Severe burns may result.**

Fuel Lines

1. Check fuel lines for signs of wear, deterioration, damage, or leakage. Replace if necessary.
2. Be sure fuel lines are routed properly, the connectors latched and the lines secured with cable ties.

CAUTION

Make sure lines are not kinked or pinched.

3. Replace all fuel lines every two years.

   NOTE: See Chapter 4 for fuel line routing diagram.

Vent Lines

Check fuel tank, oil tank, crankcase, battery and transmission vent lines for signs of wear, deterioration, damage or leakage. Replace every two years.

Be sure vent lines are routed properly and secured with cable ties.

CAUTION

Make sure lines are not kinked or pinched.

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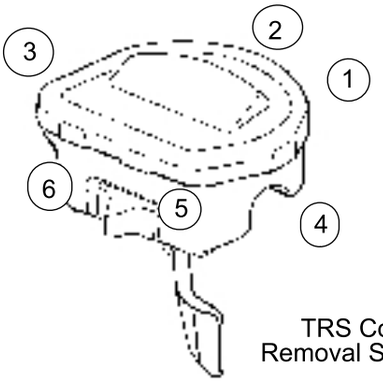
Throttle Inspection

Check for smooth throttle opening and closing in all handlebar positions. Throttle lever operation should be smooth and lever must return freely without binding.

1. Place the gear selector in Park.
2. Set parking brake.
3. Start the engine and let it idle.
4. Turn handlebars from full right to full left. If idle speed increases at any point in the turning range, inspect throttle cable routing and condition. Adjust cable tension as needed until lock-to-lock turning can be accomplished with no rise in engine rpm.
5. Replace the throttle cable if worn, kinked, or damaged.



TRS Cover Removal Sequence

Ill. 1

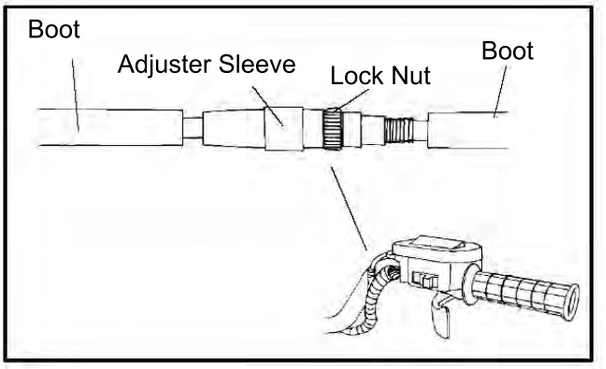
To remove the TRS cover:

6. Use a medium flat blade screwdriver and insert blade into the pocket of the cover starting on the #1 position.
7. Twist screwdriver slightly while lifting on the cover to release snap.
8. Repeat procedure at the other five locations as shown.

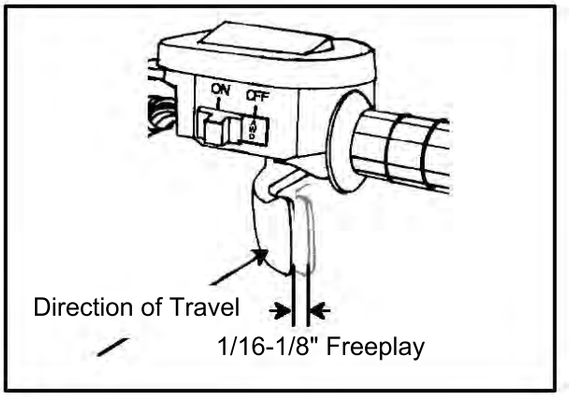
NOTE: Do not attempt to remove cover until all latch points are released.

Throttle Cable / Throttle Release System (TRS Switch) Adjustment

1. Slide boot off throttle cable adjuster and jam nut.
2. Place shift selector in neutral and set parking brake.
3. Loosen lock nut on in-line cable adjuster (Ill. 1).



4. Turn adjuster until specified freeplay is achieved at thumb lever. (see illustration). After making adjustments, quickly actuate the thumb lever several times and reverify freeplay.



= In. / mm.

Throttle Freeplay:
.0625 - .1250" (1.58 - 3.17mm)

5. Tighten lock nut securely and slide boot completely in place to ensure a water-resistant seal.
6. Turn handlebars from left to right through the entire turning range. If idle speed increases, check for proper cable routing. If cable is routed properly and in good condition, repeat adjustment procedure

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Air Filter/Pre-Filter Service

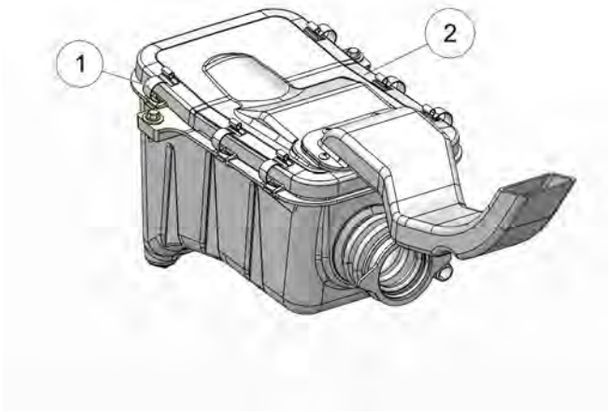
It is recommended that the air filter and pre filter be replaced annually. When riding in extremely dusty conditions, replacement is required more often.

The pre filter should be inspected before each ride, and if required, cleaned using the following procedure:

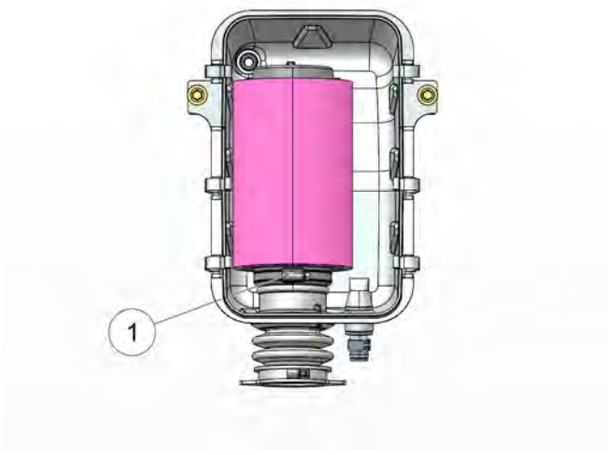
1. Lift up on the rear of the seat.
2. Pull the seat back and free of the tabs.

   NOTE: When reinstalling seat, make sure the slots in the seat engage the tabs in the fuel tank.

3. Remove clips (1) from air box cover and remove cover (2). Inspect the gasket. It should adhere tightly to the cover and seal all the way around.

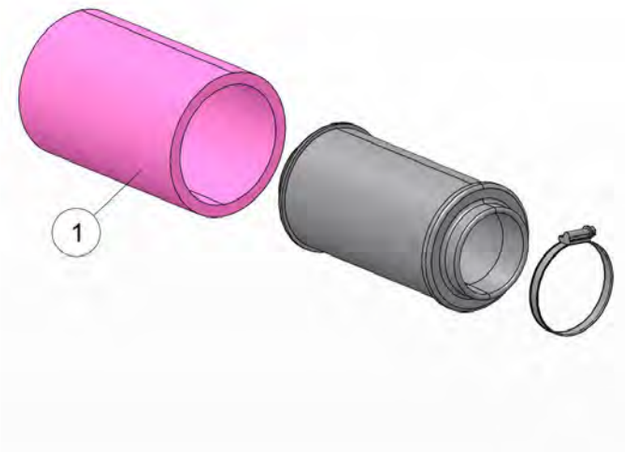


4. Loosen clamp (1) and remove air filter assembly.



Cleaning:

5. Slip the pre-filter element (1) off of main element . Clean the pre filter with hot, soapy water.



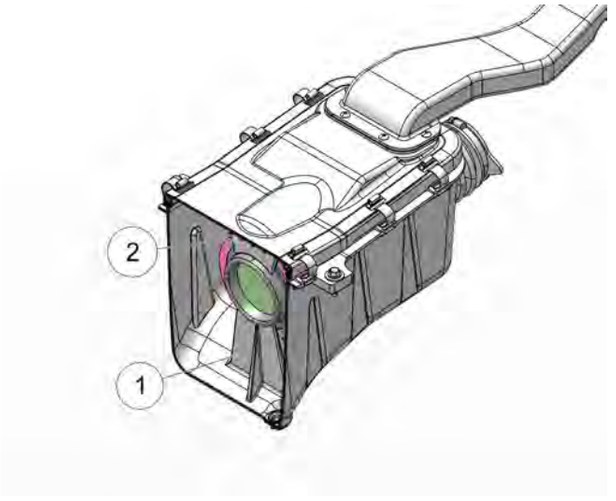
6. Rinse and dry thoroughly.
7. Inspect element for tears or damage.
8. Inspect main filter and replace if necessary. If the filter has been soaked with fuel or oil it must be replaced.

   Installation:

9. Reinstall pre-filter element over main filter. Be sure the element covers entire surface of main filter without folds, creases, or gaps.

10. Reinstall filter on main filter mount. Place filter clamp over the assembly and tighten.

    NOTE: Apply a small amount of general purpose grease to the sealing edges of the filter before reinstalling.

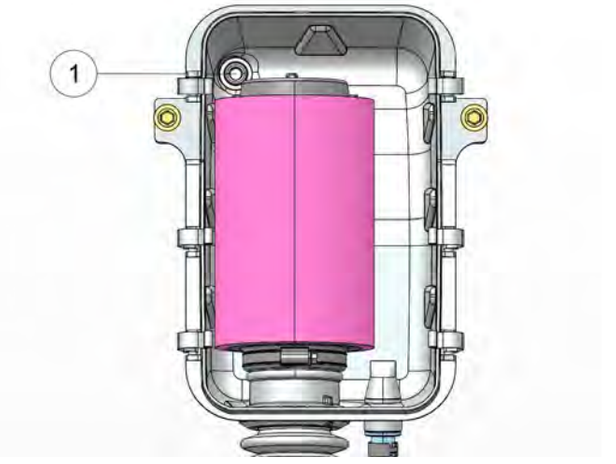


    NOTE: The air filter should rest on the filter supports (1,2). Proper placement of the air filter is important to prevent rattles and air leaks. See Illustration above.

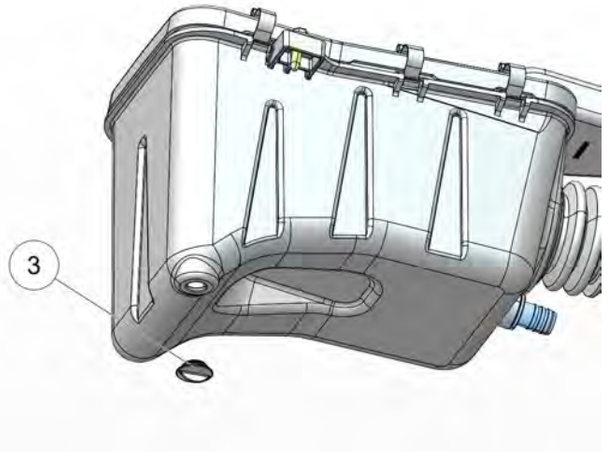
11. Install air box cover and secure with the clips.

Air Box Sediment Drain

Periodically check the air box drain (1) located in the bottom of the air box. Drain whenever deposits are visible in the air box.



1. Remove drain plug (1) from air box.



2. Drain air box.
3. Reinstall drain plug.

    NOTE: The sediment drain will require more frequent service if the vehicle is operated in wet conditions or at high throttle openings for extended periods.

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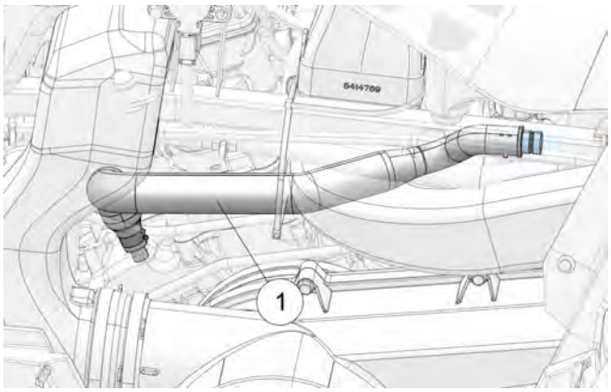
Crankcase Breather Valve / Hose

The breather valve is on the hose that runs between the engine and air box. Be sure breather line is routed properly and secured in place.



1. Remove the left side panel
2. Remove the hose clamps from the valve and pull the valve out of the hoses.
3. Inspect the valve for debris. Blow gently through the valve to check for clogging. Replace a damaged or clogged valve.

   NOTE: In-line breather filter service life is extended when the foam air box pre-filter is in place and maintained properly. Never operate the engine without the pre-filter.

4. Check the hoses for cracks, deterioration, abrasion, or leaks. Replace as needed.

CAUTION
Make sure lines are not kinked or pinched.

5. Reinstall the valve and hose clamps.

⚠ CAUTION
Operation of your vehicle without a breather valve can cause engine damage. Always reinstall the breather valve after removing it for service.

6. Install the left side panel

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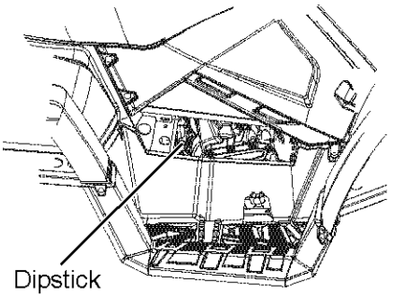
ENGINE

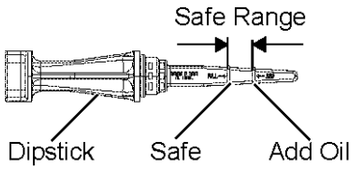
Engine Oil Level

Access the oil dipstick and fill tube from the right side of the ATV. A rising oil level between checks in cool weather driving can indicate contaminants such as gas or moisture collecting in the crankcase. If the oil level is over the full/safe mark, change the oil immediately.



1. Set machine on a level surface.
2. Clean the area around the dip stick.
3. Remove dipstick and wipe dry with a clean cloth.
4. Reinstall dipstick completely.

   NOTE: The dipstick must be screwed completely in to ensure accurate measurement.



5. Remove dipstick and check to see that the oil level is in the normal range (2). The oil should be between the top line and the bottom line on the dipstick. Add oil as indicated by the level on the dipstick. Do not overfill.

   NOTE: Rising oil level between checks in cool weather driving, can indicate moisture collecting in the oil reservoir. If the oil level is over the full mark, change the oil.

Oil and Filter Change

Always change the oil and filter at the intervals outlined in the Periodic Maintenance Chart. Always change the oil filter whenever changing oil.

Oil Filter Torque:
Turn by hand until filter gasket contacts sealing surface, then turn an additional 1/2 turn

Oil Filter Wrench:
PV-50105

Recommended Engine Oil:

Polaris PS–4
Synthetic 5W-50

CAUTION

Personal injury can occur when handling used oil. Hot oil can cause burns or skin damage.

NOTICE: Care must be taken to ensure that the fluids are contained. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembly of any component containing fluids.

1. Place vehicle on a level surface.
2. Place the transmission in PARK (P).
3. Clean area around drain plug at bottom of oil pan.
4. Start the engine. Allow it to warm up at idle for two to three minutes.
5. Stop the engine.
6. Place a drain pan under the crank case.

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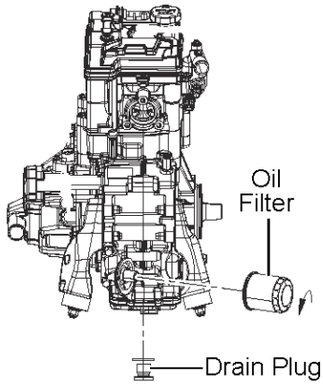
7. Remove the drain plug. Allow oil to drain completely.



Front View of the Engine

8. Replace sealing washer on drain plug.

   NOTE: The sealing surfaces on the drain plug and the oil tank should be clean and free of burrs, nicks or scratches.

9. Reinstall the drain plug and torque it to specification.

= T
Oil pan Drain Plug: **14–18 ft-lbs (19–24 Nm)**

10. Place a drain pan under the oil filter.
11. Place shop towels beneath oil filter. Use Oil Filter Wrench (**PV-50105**), turn filter counterclockwise to remove.
12. Using a clean dry cloth, clean filter sealing surface on the crankcase.
13. Lubricate the o-ring on new filter with a thin film of engine oil. Check to make sure the O-ring is in good condition.
14. Install the new filter and turn it by hand until the filter gasket contacts the sealing surface, then turn an additional 1/2 of a turn.
15. Remove dipstick (see “Engine Oils Level”).
16. Add two quarts (1.9 l) of of Polaris Premium 4 Synthetic Oil.
17. Place the transmission in PARK (P).
18. Verify that the transmission is still positioned in PARK (P).
19. Start the engine. Allow it to idle for two minuets.
20. Stop the engine and check for leaks.
21. Check the oil level on the dipstick and add oil as necessary to bring the level to the upper mark on the dipstick.
22. Dispose of used filter and oil properly.

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Compression Test Specification

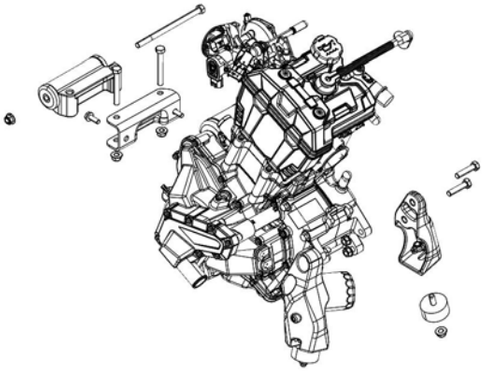
NOTE: This engine does have decompression components.

A smooth idle generally indicates good compression. Low engine compression is rarely a factor in running condition problems above idle speed.

Cylinder Compression: 80 - 120 psi (decompression)

Engine Mounts

Inspect rubber engine mounts for cracks or damage. Check engine fasteners and ensure they are tight.



Valve Clearance Inspection

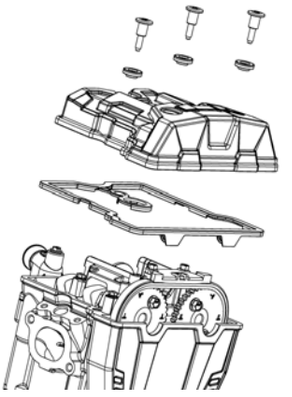
NOTE: Valve clearance inspection should be performed on a cold engine, at room temperature.

1. Remove the seats and disconnect the negative (-) battery cable.
2. Remove the air box cover and PVT ducting tubes. (Non-Touring models require fuel tank removal.
3. Remove the spark plug wire from the engine and remove the spark plug. Place a clean shop towel into the spark plug tube to prevent debris from entering the combustion chamber.
4. Remove the (3) T40 bolts retaining the valve cover.

   NOTE: Discard valve cover Isolators upon removal. New Isolators are required once removed.

   Inspect the valve cover gasket and replace if damaged or signs of leaking are present.

5. Remove the valve cover from the engine.



6. Remove the outer PVT cover and drive belt as shown in chapter 6.

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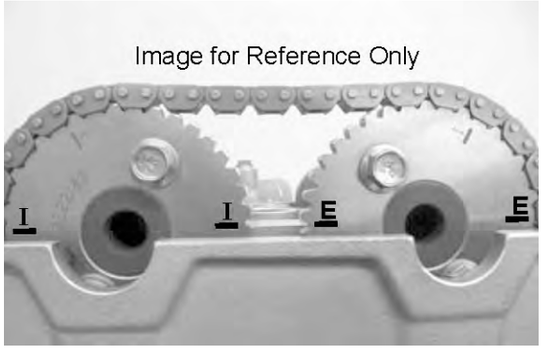
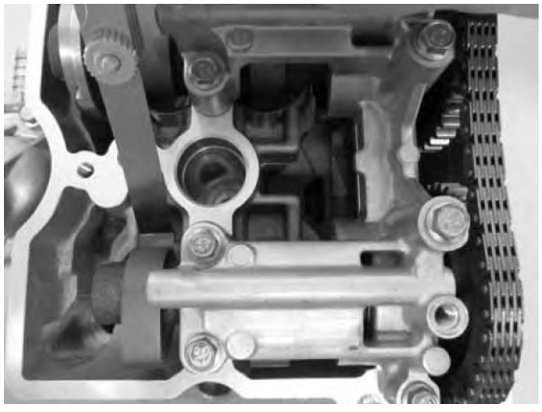
7. Rotate the drive clutch counter-clockwise until the cam chain sprocket timing marks are aligned with the gasket surface as shown (see Chapter 3 for more TDC setting procedures).

   NOTE: Intake cam sprocket should have "I" marks aligned with gasket surface and the exhaust cam sprocket should have "E" marks aligned with gasket surface.



8. Measure the valve clearance of each valve using a thickness (feeler) gauge. Record the measurement if clearance is out of specification.



9. If the valve clearance is out of specification, proceed to "Valve Clearance Adjustment" (see Chapter 3).

= In. / mm.
Intake Valve Clearance (cold): .006 ± .002 in. (0.152 ± .050 mm)

= In. / mm.
Exhaust Valve Clearance (cold): .008 ± .002 in. (0.203 ± .050 mm)

10. Repeat steps 8-9 until all (4) valves have been inspected.
11. Inspect the valve cover gasket and replace if damaged or signs of leaking are present.
12. Install the valve cover and spark plug as outlined in Chapter 3.

    NOTE: New valve cover isolators are required.

13. Install drive belt and outer clutch cover and (8) retaining screws (see Chapter 6). Torque to specification.

= T
Outer Clutch Cover Screws: **45-50 in-lbs (5 Nm)**

14. Connect the negative (-) battery cable to the battery.
15. Start the engine to ensure proper operation.
16. Reinstall the air box cover, PVT ducting and seats (see Chapter 5).

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Exhaust Pipe

⚠ WARNING

Do not perform clean out immediately after the engine has been run, as the exhaust system becomes very hot. Serious burns could result from contact with exhaust components.

To reduce fire hazard, make sure that there are no combustible materials in the area when purging the spark arrestor.

Wear eye protection.

Do not stand behind or in front of the vehicle while purging the carbon from the spark arrestor.

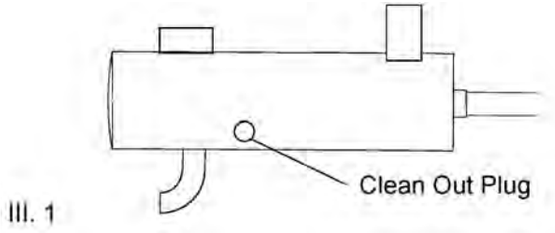
Never run the engine in an enclosed area.Exhaust contains poisonous carbon monoxide gas.

Do not go under the machine while it is inclined.Set the hand brake and block the wheels to prevent roll back.

Failure to heed these warnings could result in serious personal injury or death.

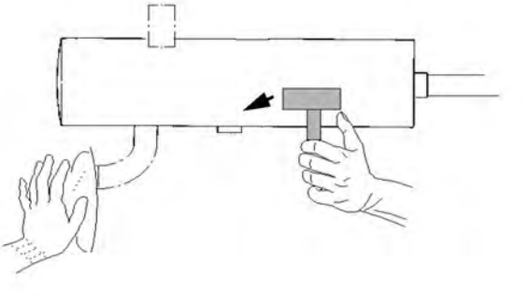
The exhaust pipe must be periodically purged of accumulated carbon as follows:

1. Remove the clean out plugs located on the bottom of the muffler.

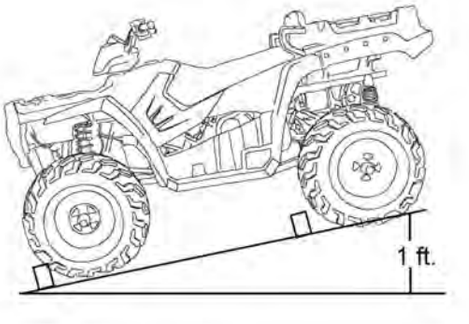


Ill. 1

2. Place the transmission in Park and start the engine. Purge accumulated carbon from the system by momentarily revving the engine several times.
3. If some carbon is expelled, cover the exhaust outlet and lightly tap on the pipe around the clean out plugs with a rubber mallet while revving the engine several more times.



4. If particles are still suspected to be in the muffler, back the machine onto an incline so the rear of the machine is one foot higher than the front. Set the hand brake and block the wheels. Make sure the machine is in Park and repeat Steps 2 and 3. **SEE WARNING**
5. If particles are still suspected to be in the muffler, drive the machine onto the incline so the front of the machine is one foot higher than the rear. Set the hand brake and block the wheels. Make sure the machine is in Park and repeat Steps 2 and 3. **SEE WARNING**



6. Repeat steps 2 through 5 until no more particles are expelled when the engine is revved.
7. Stop the engine and allow the arrestor to cool.
8. Reinstall the clean out plugs.

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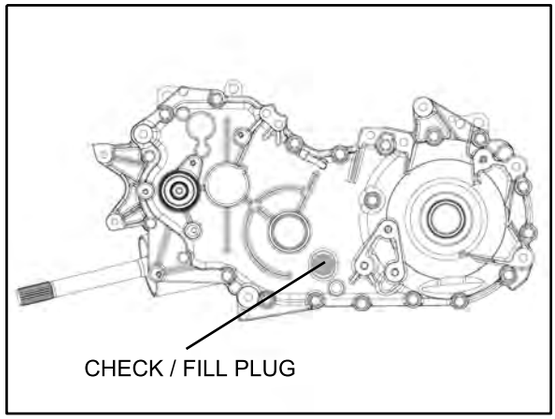
TRANSMISSION AND FRONT GEARCASE

Transmission Lubrication

The transmission lubricant level should be checked and changed in accordance with the maintenance schedule.

- Be sure vehicle is level and in Park before proceeding.
- Check vent hose to be sure it is routed properly and unobstructed.
- Follow instructions to check/change transmission lubricant.

= T
Transmission Check/Fill Plug: **14 ft-lbs (19 Nm)**



To Check the Fluid Level:

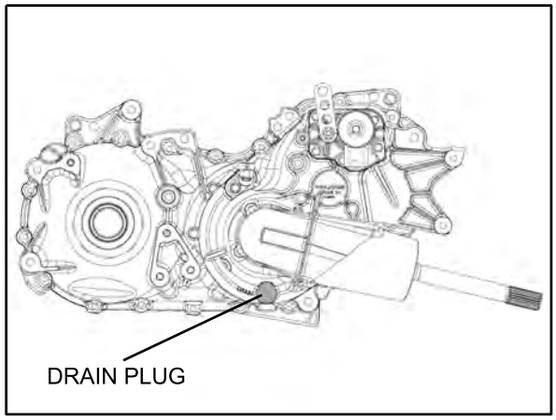
1. Remove check / fill plug from the left side of transmission and visually inspect the oil level. Level is correct when it reaches the bottom of the fill hole threads.

   NOTE: The check/fill plug is a 5/16" hex.

   To Change Lubricant:

2. Remove transmission drain plug to drain the oil. Discard used oil properly.

   NOTE: The check/fill plug is a 3/16" hex.



3. Clean and reinstall the drain plug. Torque to specification.

= T
Transmission Drain Plug: **14 ft-lbs (19 Nm)**

4. Remove fill plug.
5. Add the correct amount of Polaris AGL Plus Gearcase Lubricant.

=
Transmission - Specified Lubricant: Polaris AGL Gearcase Lubricant (Gallon - PN 2878069) (1qt. - PN 2878068) **Capacity:** 33.8 oz. (1000 ml)

6. Check for leaks.
7. Install fill plug. Torque to specification.

= T
Transmission Check/Fill Plug: **14 ft-lbs (19 Nm)**

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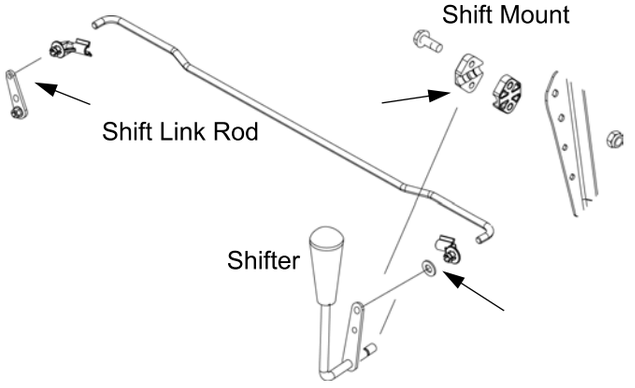
Shift Link Rod Maintenance

NOTE: Shift rod is preset at time of manufacturer.

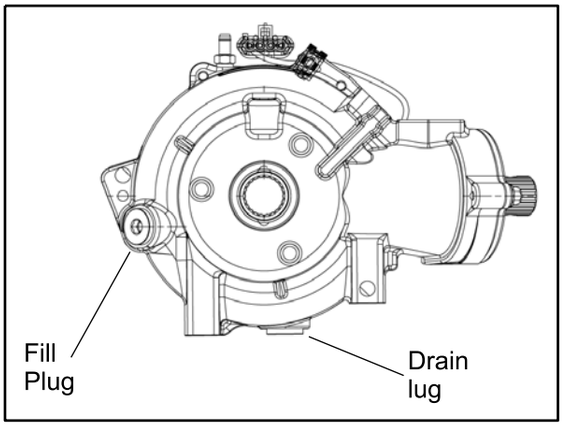
1. Lubricate pivot points with a light aerosol lubricant or grease if desired.



Front Gearcase Lubrication

The front gearcase lubricant level should be checked and changed in accordance with the maintenance schedule.

- Be sure vehicle is level before proceeding and in PARK
- Check vent hose to be sure it is routed properly and unobstructed
- The correct front gearcase lubricant to use is Polaris Demand Drive PLUS Hub Fluid.



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Specified Lubricant: Demand Drive PLUS Hub Fluid **Gearcase Capacity:** 8.97oz. (265 ml.)

= T
Fill Plug: **8-10 ft-lbs (11-14 Nm)** Drain Plug: **11 ft-lbs (15 Nm)**

To Check the Lubricant Level:

The front gearcase lubricant level cannot be checked with a dipstick. The gearcase must be drained and re-filled with the proper amount of lubricant or be filled to the bottom of the fill plug hole threads. Refer to procedures.

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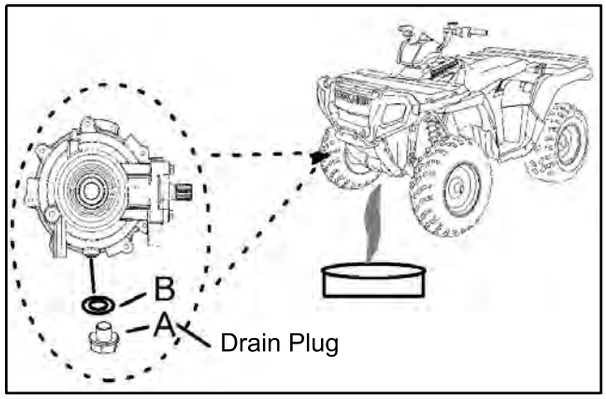
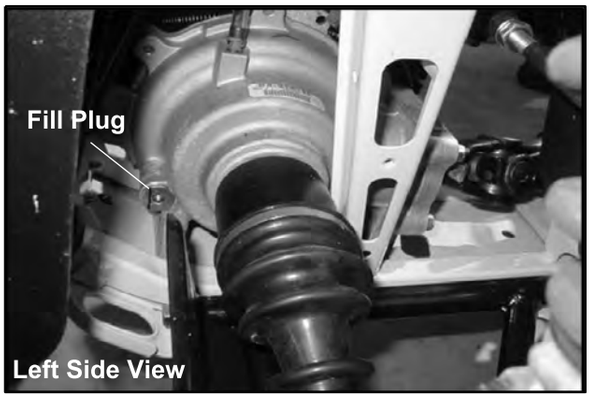
To Change Gearcase Lubricant:

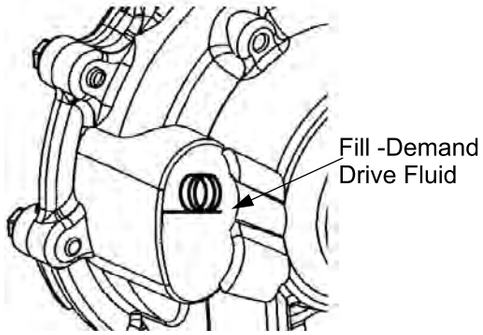


1. Remove gearcase drain plug (A) located on the bottom of the gearcase and drain oil. (The drain plug is accessible through the skid plate.) Catch and discard used oil properly.
2. Clean and reinstall drain plug (A) using a new sealing washer (B). Torque to specification.



3. Remove fill plug. Inspect the O-ring.
4. Fill with the recommended fluid amount or to the bottom of the fill plug hole threads. (See Illustration below).

Front Gearcase



5. Install / torque fill plug and check for leaks.

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COOLING SYSTEM

Liquid Cooling System Overview

The engine coolant level is controlled or maintained by the recovery system. The recovery system components are the recovery bottle, radiator filler neck, radiator pressure cap and connecting hose.

As coolant operating temperature increases, the expanding (heated) excess coolant is forced out of the radiator past the pressure cap and into the recovery bottle. As engine coolant temperature decreases the contracting (cooled) coolant is drawn back up from the tank past the pressure cap and into the radiator.

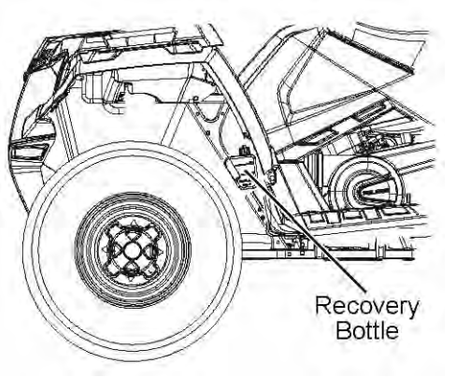
Some coolant level drop on new machines is normal as the system is purging itself of trapped air. Observe coolant levels often during the break-in period.

Overheating of engine could occur if air is not fully purged from system.

Polaris Premium 60/40 is already premixed and ready to use. Do not dilute with water.

Coolant Level Inspection

The recovery bottle, located on the left side of the machine, must be maintained between the minimum and maximum levels indicated on the recovery bottle.



With the engine at operating temperature, the coolant level should be between the upper and lower marks on the coolant reservoir. If not:

1. Remove reservoir cap. Inner splash cap vent hole must be clear and open.
2. Fill reservoir to upper mark with Polaris Premium 60/40 Anti Freeze / Coolant or 50/50 or 60/40 mixture of antifreeze and distilled water as required for freeze protection in your area.
3. Reinstall cap.

   NOTE: If overheating is evident, allow system to cool completely and check coolant level in the radiator and inspect for signs of trapped air in system.

Radiator Coolant Level

⚠ WARNING

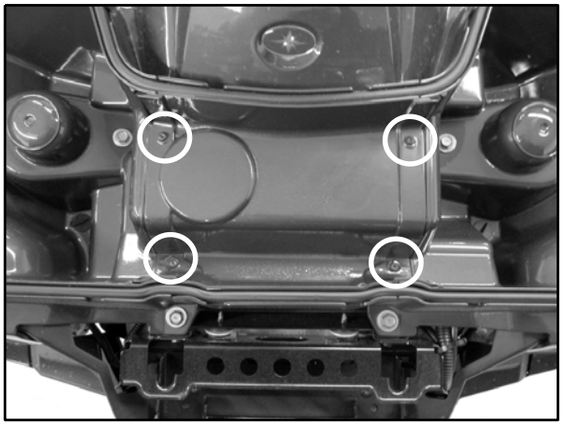
Never remove the radiator pressure cap when the engine is warm or hot. Escaping steam and fluid can cause severe burns. The engine must be allowed to cool before removing the pressure cap.

NOTE: This procedure is only required if the cooling system has been drained for maintenance and/or repair. However, if the recovery bottle has run dry, or if overheating is evident, the level in the radiator should be inspected via the radiator cap first and coolant added if necessary.

Use of a non-standard pressure cap will not allow the recovery system to function properly.

To Access the Radiator Pressure Cap:

1. Open the front rack storage area.
2. Remove the (4) T-25 screws securing the access cover to the front cab as shown below.



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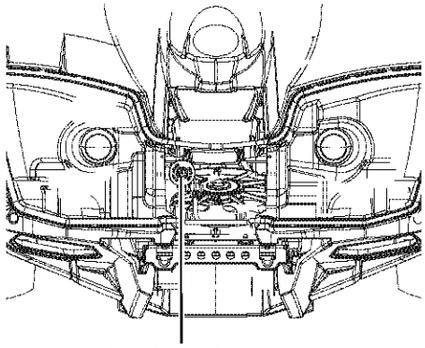
3. Move the seal out of the sealing channel and pull up on the front of the access cover. Remove the access cover.

4. The pressure cap is now accessible.



5. Remove the pressure cap and inspect fluid level. Using a funnel, add coolant until the fluid level is to the top of the filler neck.
6. Reinstall the pressure cap and install the front access cover.

Cooling System Hoses

1. Inspect all hoses for cracks, deterioration, abrasion or leaks. Replace if necessary.
2. Check tightness of all hose clamps.

⚠ CAUTION

Do not over-tighten hose clamps at radiator, or radiator fitting may distort, causing a restriction to coolant flow. Radiator hose clamp torque is 36 in-lbs (4 Nm).

Cooling System Pressure Test

System Pressure Test

1. Remove radiator cap cover located under the storage box access panel. See Chapter 3.
2. Remove recovery bottle hose from coolant filler.
3. Connect a Mity-Vac™ (**PN 2870975**) to radiator and pressurize system to 10 PSI (68.9 kpa). The system must retain 10 lbs of pressure for five minutes or longer. If pressure loss is evident within five minutes, check radiator, all cooling system hoses and clamps, or water pump seal.

Radiator Cap Pressure Test

4. Remove radiator cap and test using a cap tester (commercially available).
5. The radiator cap relief pressure is 13 lbs (89.6 kpa).

Recommended Coolant

Use only high quality antifreeze/coolant mixed with distilled water in a 50/50 or 60/40 ratio, depending on freeze protection required in your area.

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Coolant Strength / Type

Test the strength of the coolant using an antifreeze hydrometer.

Antifreeze Hydrometer

- A 50/50 or 60/40 mixture of antifreeze and distilled water will provide the optimum cooling, corrosion protection, and antifreeze protection.
- Do not use tap water, straight antifreeze, or straight water in the system. Tap water contains minerals and impurities which build up in the system.
- Straight water or antifreeze may cause the system to freeze, corrode, or overheat.

Polaris 60/40 Anti-Freeze/ Coolant

(PN 2871323)

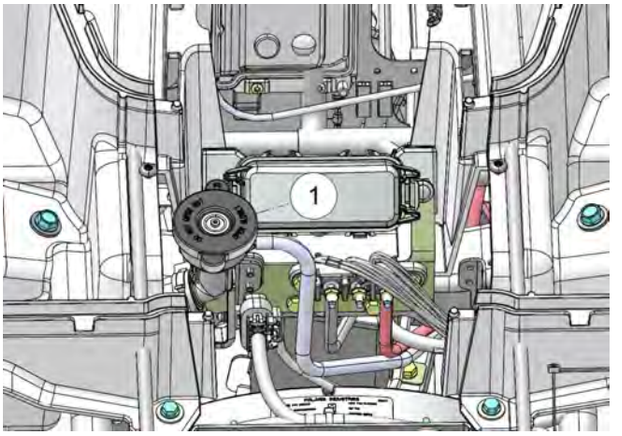
Coolant Drain / Fill

Coolant Drain

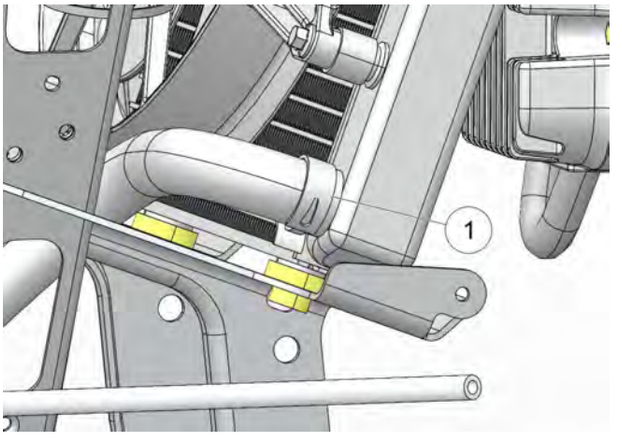
1. Remove the front cover located under the front rack, right inner fender and footwell plastics.
2. Slowly remove the pressure cap (1) to relieve any cooling system pressure.

⚠ WARNING

Never drain the coolant when the engine and radiator are warm or hot. Hot coolant can cause severe burns. Allow engine and radiator to cool.



3. Place a suitable drain pan underneath the radiator fitting on the front right-hand side of the vehicle.
4. Drain the coolant from the radiator by removing the lower coolant hose (1) from the radiator as shown. Properly dispose of the coolant.



5. Allow coolant to completely drain.

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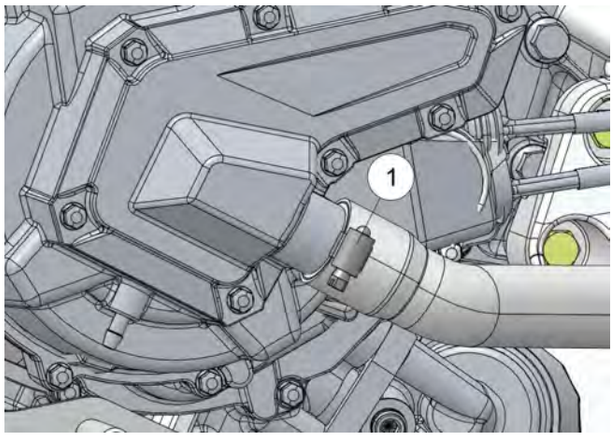
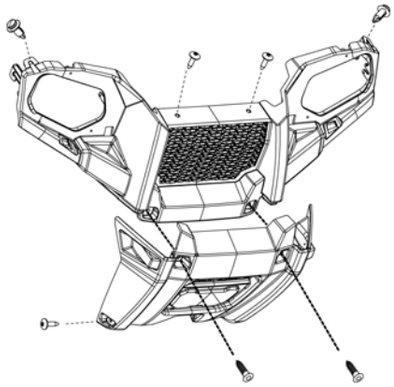
6. Place a suitable drain pan underneath the lower engine hose(1) on the right-hand side of the vehicle.



7. Remove the hose and completely drain the engine. Reinstall the lower coolant hose.
8. Properly dispose of the coolant.
9. Remove the pressure cap. Using a funnel, add the recommended coolant to the top of the filler neck and fill the recovery bottle to the MAX level.
10. Refer to Chapter 3 for the “Cooling System Bleeding Procedure”.

Polaris Premium Antifreeze
2871534 - Quart
2871323 - Gallon

Radiator/Grill Screen



1. Check radiator air passages for restrictions or damage. Check and clean the radiator grille if needed.
2. Carefully straighten any bent radiator fins.
3. Remove any obstructions with compressed air or low pressure water.

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FINAL DRIVE / WHEEL AND TIRE

Wheels

Inspect all wheels for runout or damage. Check wheel nuts and ensure they are tight. Do not over tighten the wheel nuts.

⚠ WARNING

Operating an ATV with worn tires will increase the possibility of the vehicle skidding and possible loss of control.

Worn tires can cause an accident.

Always replace tires when the tread depth measures 1/8” (.3 cm) or less.

Inspect all wheels for runout or damage. Check wheel nuts and ensure they are tight. Do not over tighten the wheel nuts.

Wheel, Hub, And Spindle Torque Table

ITEM	SPECIFICATION
Steel - Front Wheel Nuts	27 ft-lbs (37 Nm)
Steel - Rear Wheel Nuts	27 ft-lbs (37Nm)
Aluminum Front Wheel Nuts	30 ft-lbs + 1/4 Turn (41 Nm + 1/4 Turn)
Aluminum Rear Wheel Nuts	30 ft-lbs + 1/4 Turn (41 Nm + 1/4 Turn)
Front Hub Retaining Nut	60 ft-lbs (81 Nm)
Rear Hub Retaining Nut	80 ft-lbs (109 Nm)

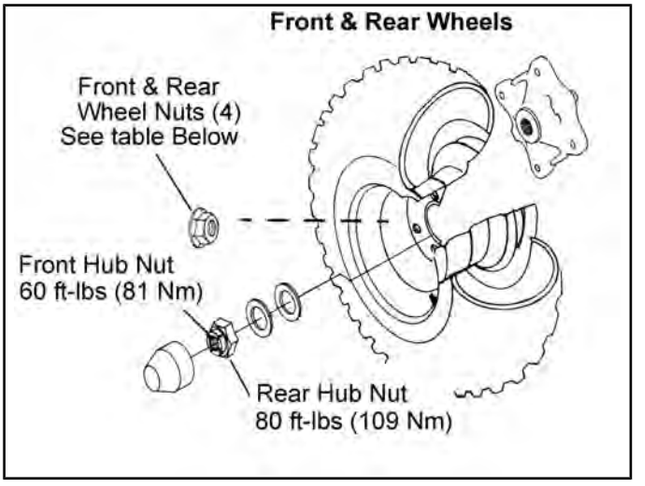
Tire Pressure

⚠ CAUTION

Maintain proper tire pressure. Refer to the warning tire pressure decal applied to the vehicle.

Tire Pressure (Cold)	
Front	Rear
5 (34.5 Kpa)	5 (34.5Kpa)

Wheel Removal Front or Rear



1. Stop the engine, place the transmission in Park and lock the parking brake.
2. Loosen the wheel nuts slightly.
   - Elevate the side of the vehicle by placing a suitable stand under the footrest frame.
3. Remove the wheel nuts and remove the wheel.

Wheel Installation

1. With the transmission in Park and the parking brake locked, place the wheel in the correct position on the wheel hub. Be sure the valve stem is toward the outside and rotation arrows on the tire point toward forward rotation.
2. Attach the wheel nuts and finger tighten them.
3. Lower the vehicle to the ground.

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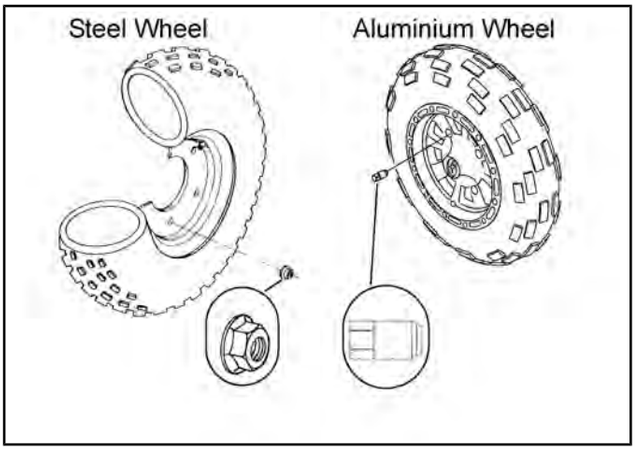
4. Securely tighten the wheel nuts to the proper torque listed in the table.



⚠ CAUTION

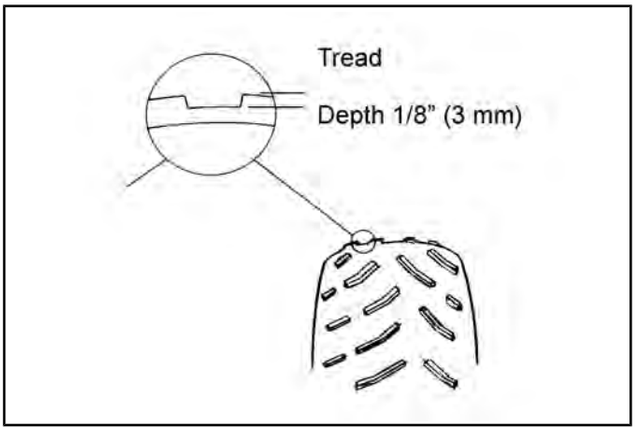
If wheels are improperly installed it could affect vehicle handling and tire wear. On vehicles with tapered rear wheel nuts, make sure tapered end of nut goes into taper on wheel.

Tire Inspection

- Improper tire inflation may affect ATV maneuverability.
- When replacing a tire always use original equipment size and type.
- The use of non-standard size or type tires may affect ATV handling.

Tire Tread Depth

Always replace tires when tread depth is worn to 1/8" (3 mm) or less.



⚠ WARNING

Operating an ATV with worn tires will increase the possibility of the vehicle skidding easily with possible loss of control.

Worn tires can cause an accident.

Always replace tires when the tread depth measures 1/8” (.3 cm) or less.

CV Shaft Boot Inspection

Inspect the CV shaft boots in the front and rear of the ATV for damage, tears, wear, or leaking grease. If the rubber boot exhibits any of these symptoms, replace the boot. Refer to Chapter 7 for CV boot replacement.

Frame, Nuts, Bolts, Fasteners

Periodically inspect the torque of all fasteners in accordance with the maintenance schedule. Check that all cotter pins are in place. Refer to specific fastener torques listed in each chapter.

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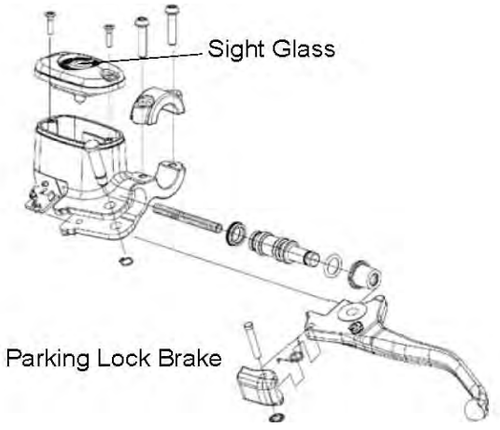
BRAKE SYSTEM

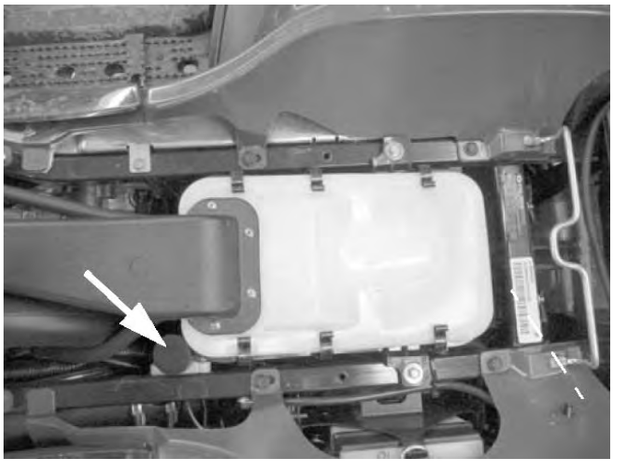
Brake System Inspection

The following checks are recommended to keep the brake system in good operating condition. Service life of brake system components depends on operating conditions. Inspect brakes in accordance with the maintenance schedule and before each ride.

- Keep fluid level in the master cylinder reservoir to the indicated level inside reservoir.
- Use Polaris DOT 4 Brake Fluid



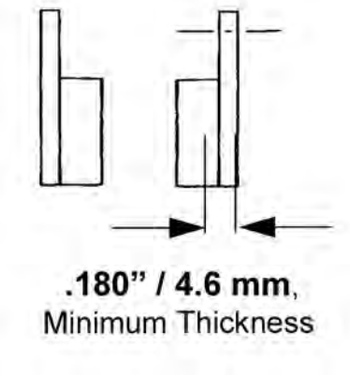
Use Polaris DOT 4 Brake Fluid



- Check brake for excessive travel or spongy feel.
- Check brake system for fluid leaks.
- Check friction pads for wear, damage or looseness.
- Check surface condition of the disc.

Brake Pad Inspection

Pads should be changed when the friction material is worn to **.180" / 4.6 mm**, or about the thickness of a dime.



= In. / mm.
Brake Pad Service Limit: **.180" (4.6 mm)**

Hose/Fitting Inspection

Check brake system hoses and fittings for cracks, deterioration, abrasion, and leaks. Tighten any loose fittings and replace any worn or damaged parts.

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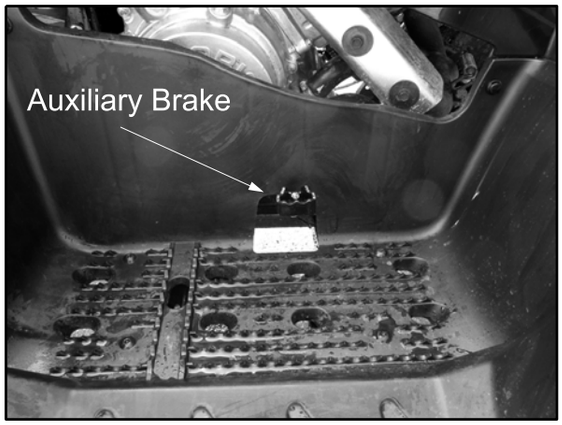
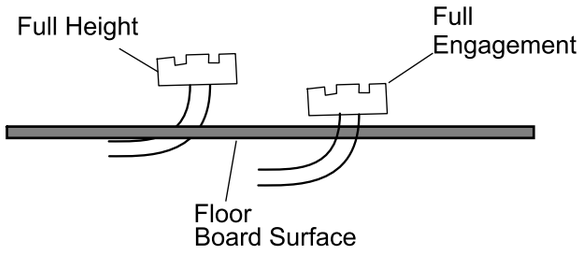
Auxiliary Brake Testing

The auxiliary brake should be checked for proper function.



1. Support the rear wheels off the ground.
2. While turning the rear wheels by hand, apply the auxiliary foot brake. This brake should not stop the wheels from turning until the lever is half way between its rest position and bottoming on the footrest.

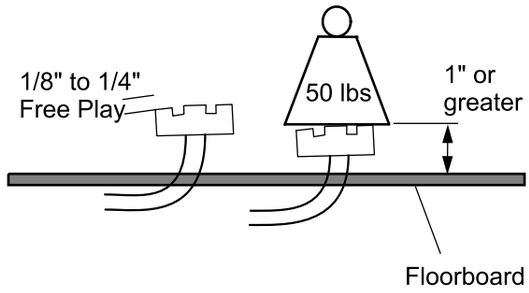
Auxiliary Foot Brake Pedal



Auxiliary Brake Adjustment (Hydraulic)

Use the following procedure to inspect the hydraulic auxiliary (foot) brake system and adjust or bleed if necessary:

First, check foot brake effectiveness by applying 50 lb. (approx.) downward force on the pedal. The top of the pedal should be at least 1 inch, (25.4mm) above the surface of the footrest.



If less than one inch, two things must be examined:

Free Play:

 = In. / mm.
Foot Brake Freeplay: **1/8 - 1/4" (3.2 - 6.35 mm)**

If free play is excessive, inspect pedal, linkage, and master cylinder for wear or damage and replace any parts as needed.

Bleeding:

If free play is correct and brake pedal travel is still excessive, air may be trapped somewhere in the system. Bleed the hydraulic auxiliary brake system in a conventional manner, following the procedure outlined in Brake Chapter 9.

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ELECTRICAL AND IGNITION SYSTEM

Battery Maintenance

Complete battery servicing information for both conventional and sealed batteries can be found in Chapter 10 of this manual.

⚠ WARNING

CALIFORNIA PROPOSITION 65 WARNING:

Batteries, battery posts, terminals and related accessories contain lead and lead compounds and other chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing.

ANTIDOTE:

External: Flush with water.

Internal: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call a physician immediately.

Eyes: Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield eyes when working near batteries.

KEEP OUT OF REACH OF CHILDREN.

NOTE: Expected battery shelf life is 6-8 months depending on storage conditions. As a general rule before placing the battery into service, check the battery condition and charge accordingly.

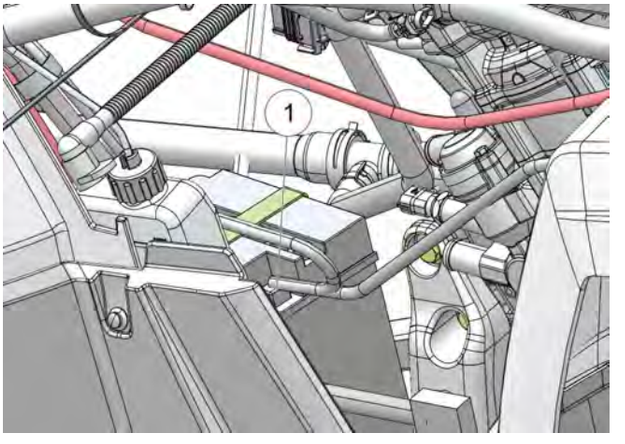
New Batteries: **Batteries must be fully charged before use or battery life can be reduced by 10-30% of full potential. Charge battery for 3-5 hours at a current equivalent of 1/10 of the battery's rated amp/hour capacity (i.e. 12amp hr x .10 = 1.2 amp charging). Do not use the alternator to charge a new battery.**

Battery Removal

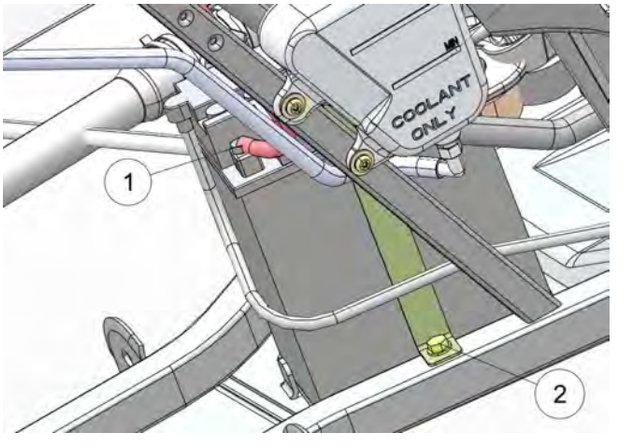
CAUTION

To reduce the chance of sparks: Whenever removing the battery, disconnect the black (negative) cable first. When reinstalling the battery, install the black (negative) cable last.

1. Remove body panel above the left footwell.
2. Disconnect the black (2) negative battery cables(s).



3. Disconnect the red (1) positive battery cable(s).



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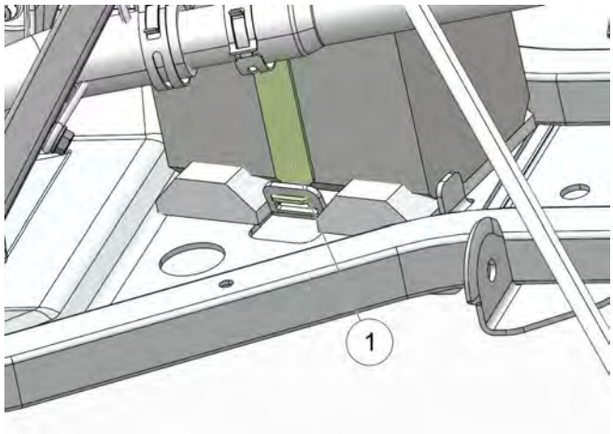
4. Remove the screw (see (2) shown in step 3) that fastens the hold-down strap and remove the hold down strap(1).

   NOTE:



5. Lift the battery out of the vehicle.

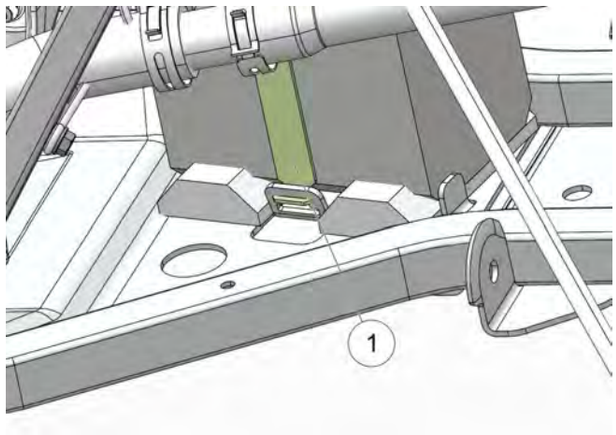
Battery Installation

NOTE: Using a new battery that has not been fully charged can damage the battery and result in a shorter life. It can also hinder vehicle performance. Follow the battery charging procedure in Chapter 10 "Electrical" before installing the battery.

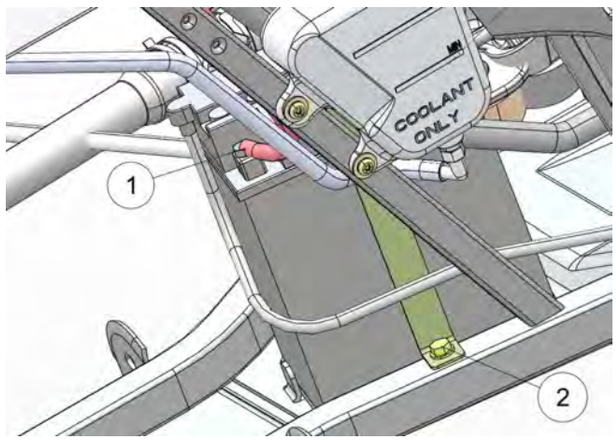
CAUTION

To reduce the chance of sparks: Whenever removing the battery, disconnect the black (negative) cable first. When reinstalling the battery, install the black (negative) cable last.

1. Ensure the battery is fully charged.
2. Place the battery in the battery holder and secure with hold-down strap. (see (2) shown in step 4)



3. Coat the terminals with dielectric grease or petroleum jelly.
4. Connect and tighten the red positive cable(s) first.



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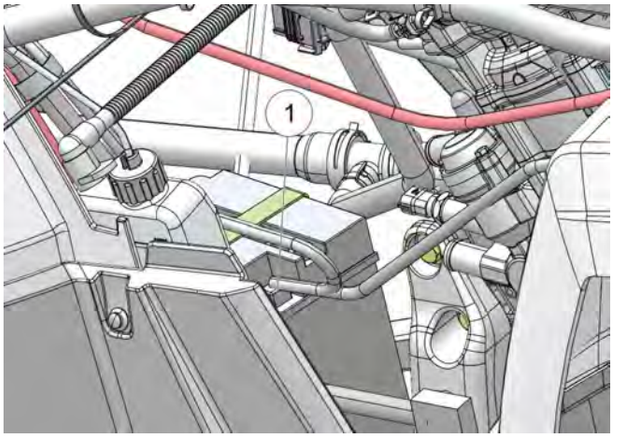
5. Connect and tighten the black (negative) cable last.



6. Verify that cables are properly routed and reinstall the body panel above the footwell.

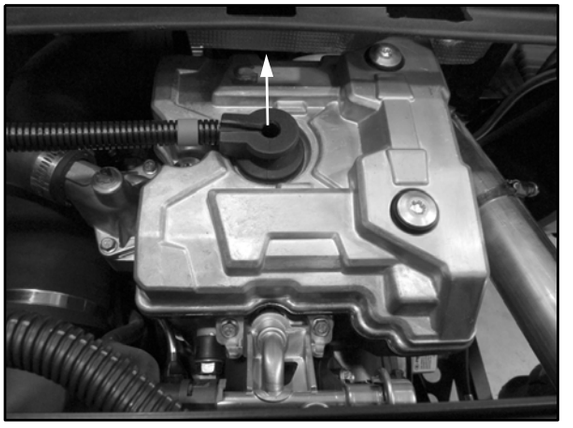
Spark Plug Service

1. Remove the driver's seat and disconnect the (-) negative battery cable from the battery.

⚠ WARNING

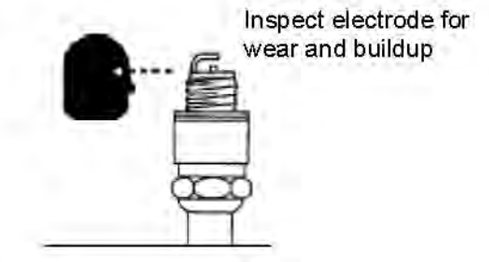
A hot exhaust system and engine can cause serious burns. Allow engine to cool or wear protective gloves when removing the spark plugs.

2. Clean top of engine to remove all dirt and debris.
3. Remove the spark plug wire from the engine.



NOTE: Image For Reference Only.

4. Remove spark plug.
5. Inspect electrodes for wear and carbon buildup. Look for a sharp outer edge with no rounding or erosion of the electrodes.



6. Clean with electrical contact cleaner only.

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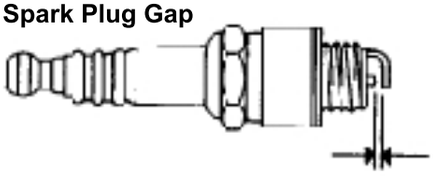
7. Measure gap with a wire gauge. Adjust gap if necessary by carefully bending the side electrode.

Spark Plug Gap



Gap - .0276 - .0315" (0.7 - 0.8 mm)

8. If necessary, replace spark plug with proper type. **CAUTION:** Severe engine damage may occur if the incorrect spark plug is used.
9. Apply Anti-seize compound to the spark plug threads.
10. Install spark plugs and torque to specification.

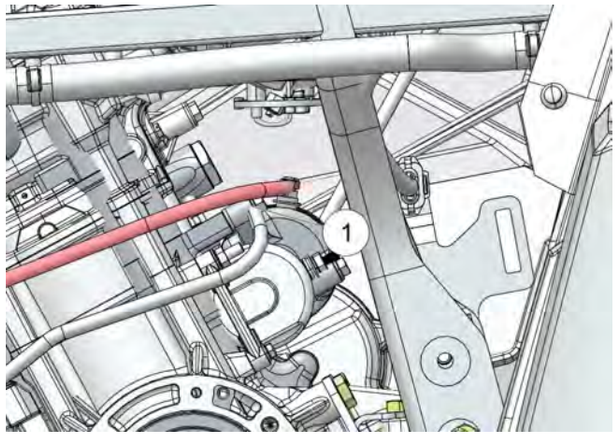
Recommended Spark Plug: **Champion RG6YC**
= T
Spark Plug: **7 ft-lbs (10 Nm)** **Apply Anti-seize**

11. Install spark plug wire into spark plug / engine.
12. Reinstall the (-) negative battery cable and driver's seat.

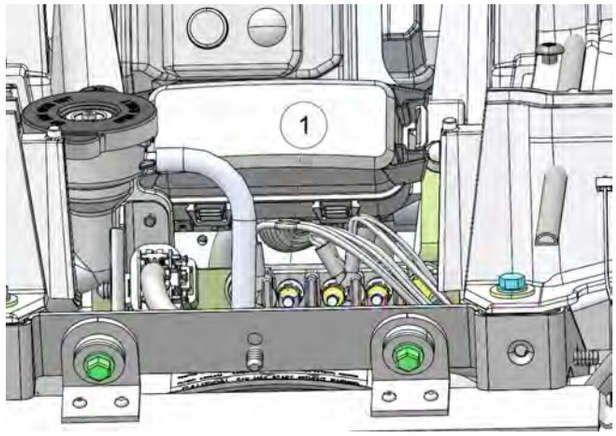
Engine To Frame Ground

Inspect ground cable connections. Be sure they are clean and tight.

The engine ground cable runs from the upper starter motor mounting bolt to the battery.



The chassis ground runs from the battery to the terminal block located at the front of the machine near the fuse box.



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STEERING

The steering components should be checked periodically for loose fasteners, worn tie rod ends, and damage. Also check to make sure all cotter pins are in place. If cotter pins are removed, they must not be re-used. Always use new cotter pins.

Replace any worn or damaged steering components. Steering should move freely through entire range of travel without binding. Check routing of all cables, hoses, and wiring to be sure the steering mechanism is not restricted or limited.

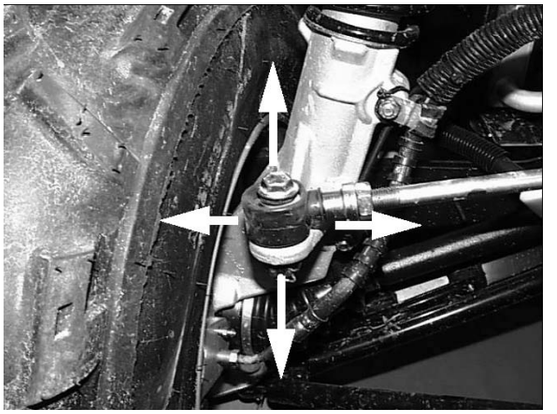
NOTE: Whenever steering components are replaced, check front end alignment. Use only genuine Polaris parts.

⚠ WARNING

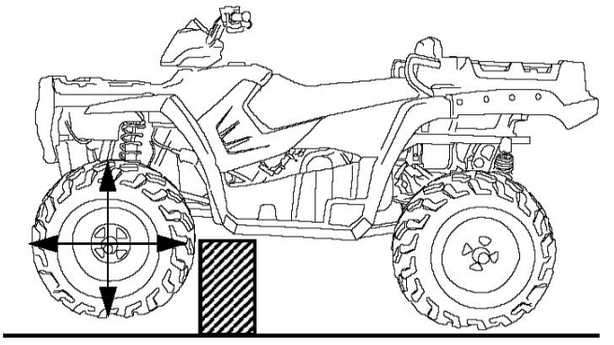
Due to the critical nature of the procedures outlined in this chapter, Polaris recommends steering component repair and adjustment be performed by an authorized MSD-certified technician when replacing worn or damaged steering parts.
Use only genuine Polaris replacement parts.

Tie Rod End/Steering Inspection

- To check for play in the tie rod end, grasp the steering tie rod, pull in all directions feeling for movement.
- Repeat inspection for inner tie rod end on steering post.



- Replace any worn steering components. Steering should move freely through entire range of travel without binding.
- Elevate front end of machine so front wheels are off the ground. Check for any looseness in front hub / wheel assembly by grasping the tire firmly at top and bottom first, and then at front and rear. Try to move the wheel and hub by pushing inward and pulling outward.
- If abnormal movement is detected, inspect the hub and wheel assembly to determine the cause (possible loose wheel nuts or loose front hub components).



Check for Loose Wheel or Hub

- Refer to the Body/Steering Chapter 5 or Final Drive Chapter 7 for service procedures.

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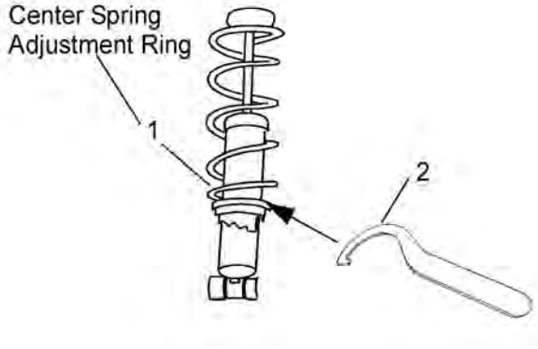
Front Suspension

Compress and release front suspension. Damping should be smooth throughout the range of travel.

Check all front suspension components for wear or damage.

Inspect front strut cartridges for leakage.

Suspension Spring Preload Adjustment



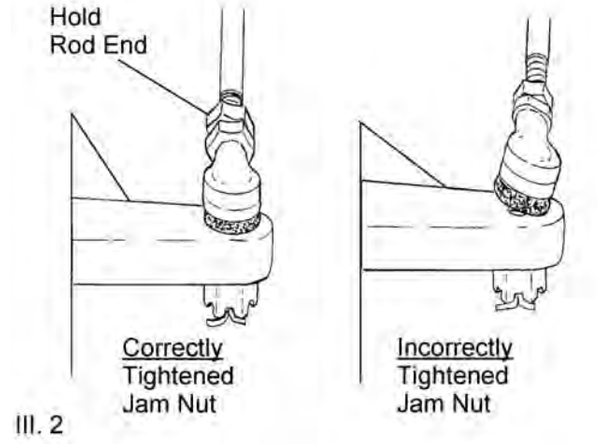
Shock Spanner Wrench (PN 2871095)

Operator weight and vehicle loading affect suspension spring preload requirements. Adjust as necessary, using the spanner wrench (2) to turn the adjustment cam (1).

Toe Alignment Adjustment

If toe alignment is incorrect, measure the distance between vehicle center and each wheel. This will tell you which tie rod needs adjusting. **NOTE: Be sure handlebars are straight ahead before determining which tie rod(s) need adjustment.**

CAUTION
During tie rod adjustment, it is very important that the following precautions be taken when tightening tie rod end jam nuts. If the rod end is positioned incorrectly it will not pivot, and may break.



Ill. 2

To adjust toe alignment:

- Hold tie rod end to keep it from rotating.
- Loosen jam nuts at both end of the tie rod.
- Shorten or lengthen the tie rod until alignment is as required to achieve the proper toe setting as specified.
- **IMPORTANT: When tightening the tie rod end jam nuts, the rod ends must be held parallel to prevent rod end damage and premature wear. Damage may not be immediately apparent if done incorrectly. See illustration 2.**
- After alignment is complete, torque jam nuts to specification.

= T
Tie Rod Jam Nut: **12-14 ft-lbs (16-19 Nm)**

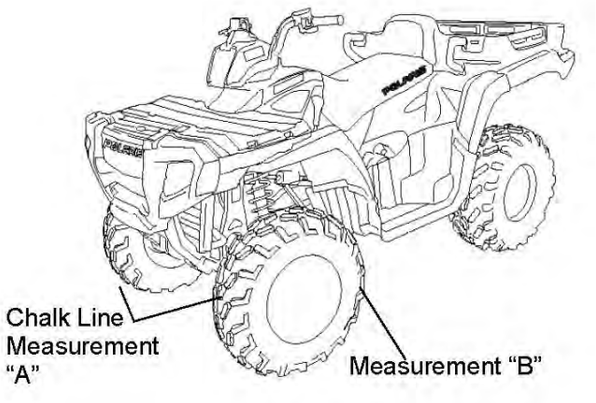
Camber and Caster

The camber and caster are non-adjustable.

Wheel Alignment

1. Place machine on a smooth level surface.
2. Set handlebars in a straight ahead position and secure handlebars in this position. **NOTE:** The steering arm center section can be used as an indicator of whether the handlebars are straight. The center section should always point straight back from the steering post.

3. Place a chalk mark on the center line of the front tires approximately 10" (25.4 cm) from the floor or as close to the hub/axle center line as possible. **NOTE:** It is important that the height of both marks be equally positioned in order to get an accurate measurement.
4. Measure the distance between the marks and record the measurement. Call this measurement “A”.
5. Rotate the tires 180º by moving vehicle forward or backward. Position chalk marks facing rearward, even with the hub/axle centerline.
6. Again measure the distance between the marks and record. Call this measurement “B”. Subtract measurement “B” from measurement “A”. The difference between measurements “A” and “B” is the vehicle toe alignment. The recommended vehicle toe tolerance is 1/8" to 1/4" (.3 to.6 cm) toe out. This means the measurement at the front of the tire (A) is 1/8" to 1/4" (.3 to .6 cm) wider than the measurement at the rear (B)



= In. / mm.
Wheel Toe-Out: **(A) - (B) = 1/8” to 1/4" (3 to 6 mm)**

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CHAPTER 3
ENGINE

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GENERAL INFORMATION

Special Tools

PART NUMBER	TOOL DESCRIPTION
PW-47053	Bench Mount Engine Stand Adapter
PU-50658	Clutch Center Distance Tool
PU-50784	Crankshaft Removal / Installation Tool Kit
PU-50563	Cylinder Holding & Camshaft Timing Plate
PU-50624	Engine Stand (2” Bore)
PU-50824-A	Engine Stand Adapter (Mounts To The Engine)
PU-50625	Engine Stand Sleeve Adapter (Use With 2” Bore Stand)
PW-47054	Engine Stand Sleeve Adapter (Use With 2.375” Bore Stand)
PA-49316	Flywheel Puller
PU-50105	Oil Filter Wrench
PV-43531	Oil Pressure Gauge
PU-50569	Oil Pressure Gauge Adapter
PA-49317	Stator Cover Removal Handles
PV-1253 or PV-4019 (Quick Release)	Valve Spring Compressor
PV-43513-A	Valve Spring Compressor Adapter
PU-50689	Water Pump Mechanical / Oil Seal Installation Kit

Bosch Automotive Service Solutions- 1-800-328-6657
http://polaris.service-solutions.com/.

Engine Lubrication Specifications

Oil Capacity:
Approx. 2 Quarts (1.9 L)

Oil Filter Wrench:
PU-50105 or 2.5” (64 mm)

Oil Type:
Polaris PS-4
Synthetic Engine Oil

Oil Pressure
Minimum Specification:
(using Polaris PS-4 at operating temperature)
10 PSI @ 1200 RPM (Minimum)
40 PSI @ 7000 RPM (Minimum)

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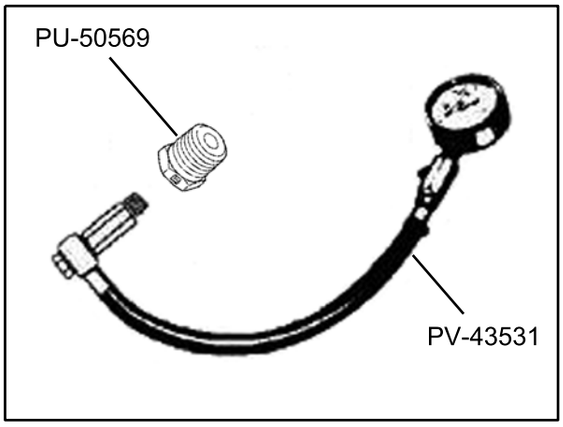
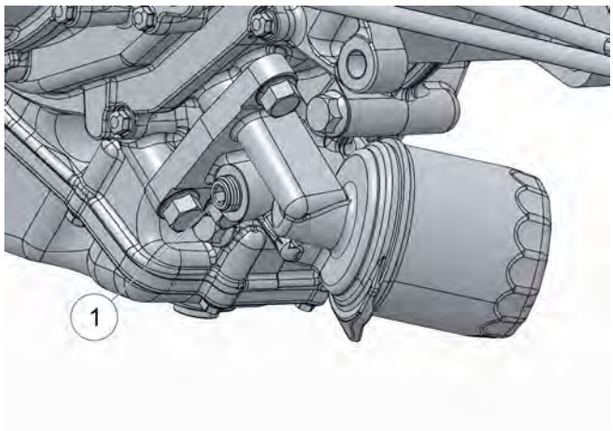
Oil Pressure Test

1. Attach the Oil Pressure Gauge Adapter (PU-50569) to the Oil Pressure Gauge (PV-43531).



Oil Pressure Gauge Adapter: PU-50569
Oil Pressure Gauge: PV-43531

2. Remove the seat, Left footwell, and left side pannel.
3. Clean the area around the main oil gallery plug (1), located on the oil filter adapter housing.
4. Remove the plug (1) and insert the oil pressure adapter.



5. Start engine and allow it to reach operating temperature, monitoring gauge indication.

NOTE: Test results are based on the use of the recommended engine oil (Polaris PS-4) at operating temperature, and may vary considerably if any other oil is used or if engine is not up to temperature.

=

Oil Capacity: Approx. 2 Quarts (1.9 L)

Oil Filter Wrench: PU-50105 or 2.5” (64 mm)

Oil Type: Polaris PS-4
Synthetic Engine Oil

Oil Pressure
Minimum Specification:
(using Polaris PS-4 Plus at operating temperature)
10 PSI @ 1200 RPM (Minimum)
40 PSI @ 7000 RPM (Minimum)

6. Upon assembly, torque the crankcase gallery plug to specification.

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Oil Gallery Plug:
11 ft-lbs (15 Nm)

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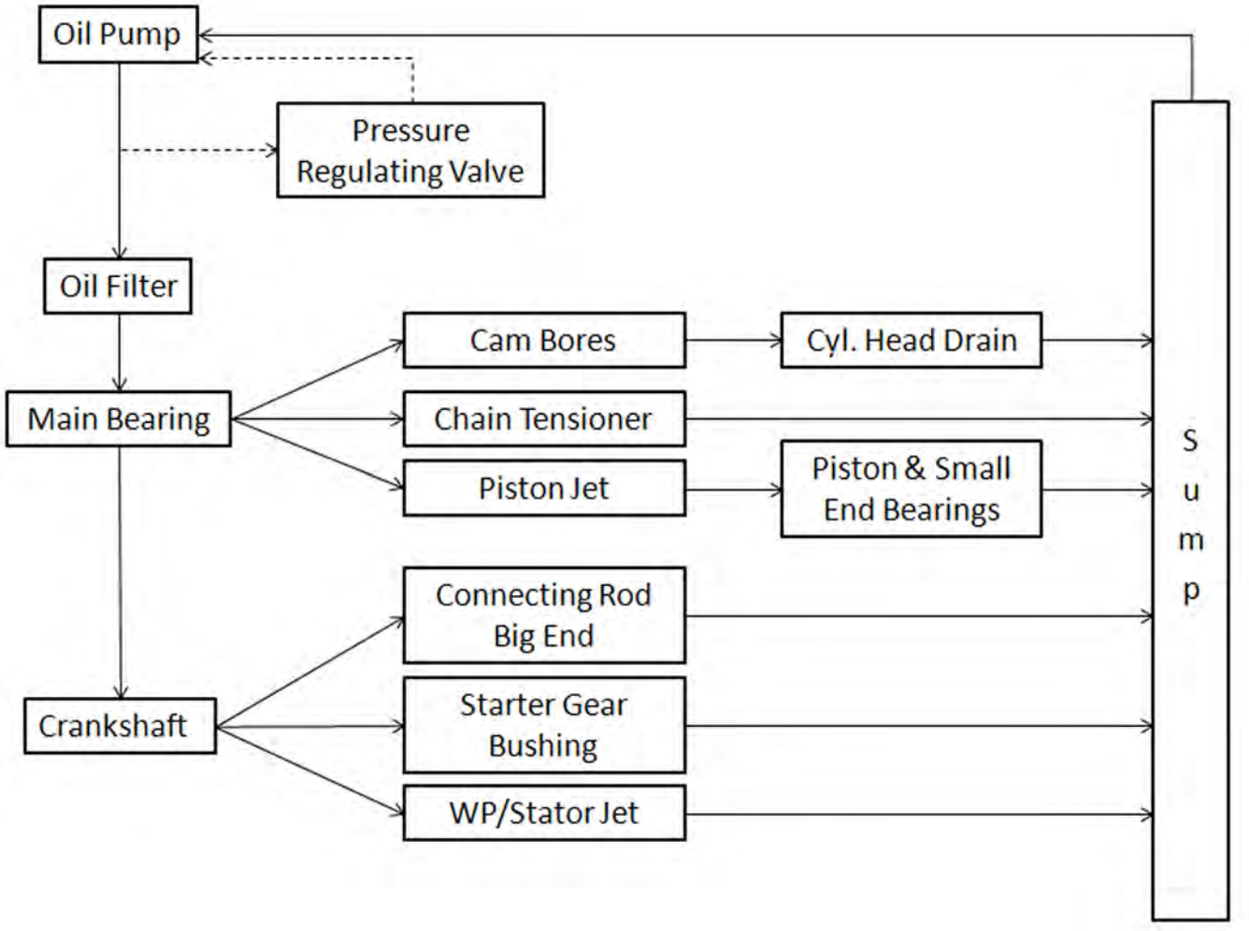
Engine Oil Flow Chart



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ENGINE SERVICE SPECIFICATIONS

Engine Specifications

CAMSHAFT / CYLINDER HEAD / CYLINDER (IN. / MM)		
Camshaft	Cam Lobe Height - Intake	1.5704" ± 0.0038" (39.89 ± 0.097 mm)
	Cam Lobe Height - Exhaust	1.5405" ± 0.0038" (39.13 ± 0.097 mm)
	Camshaft Journal O.D. - All (Standard)	0.9029" - 0.9037 " (22.933 - 22.954 mm)
	Camshaft Journal O.D. - All (Service Limit)	0.9025" (22.923 mm)
	Camshaft Journal Bore I.D. - All (Standard)	0.9055" - 0.9063" (23.000 - 23.021 mm)
	Camshaft Journal Bore I.D. - All (Service Limit)	0.9072" (23.044 mm)
	Camshaft Oil Clearance (Standard)	0.0018" - 0.0034" (0.046 - 0.088 mm)
	Camshaft Oil Clearance (Service Limit)	0.0047" (0.121 mm)
	Camshaft End Play (Standard)	0.0069" - 0.0128" (0.175 - 0.325 mm)
	Camshaft End Play (Service Limit)	0.0157" (0.4 mm)
Cylinder Head	Cylinder Head - Surface Warp Limit	0.0024" (0.060 mm)
	Cylinder Head - Standard Height	4.745" ± 0.0020" (120.53 ± 0.05 mm)
Valve Seat	Contacting Width - Intake (Standard)	0.0393" ± 0.0039" (1.0 ± 0.10 mm)
	Contacting Width - Intake (Service Limit)	0.0551" (1.4 mm)
	Contacting Width - Exhaust(Standard)	0.0590" ± 0.0039" (1.5 ± 0.10 mm)
	Contacting Width - Exhaust (Service Limit)	0.0748" (1.9 mm)
	Valve Seat Angles	30.0° ± 1.5° / 45.0° ± 0.5° / 60.0° ± 1.5°
Valve Guide	Valve Guide Inner Diameter	0.2165" - 0.2171" (5.500 - 5.515 mm)
Valve	Valve Lash (Cold) - Intake	0.006" ± 0.002" (0.152 ± 0.050 mm)
	Valve Lash (Cold) - Exhaust	0.008" ± 0.002" (0.203 ± 0.050 mm)
	Valve Stem Diameter - Intake	0.2155" - 0.2161" (5.475 - 5.490 mm)
	Valve Stem Diameter - Exhaust	0.2147" - 0.2153" (5.455 - 5.470 mm)
	Valve Stem Oil Clearance - Intake	0.0003" - 0.0015" (0.010 - 0.040 mm)
	Valve Stem Oil Clearance - Exhaust	0.0011" - 0.0023" (0.030 - 0.060 mm)
	Valve Stem Overall Length - Intake	3.7704" (95.77 mm)
	Valve Stem Overall Length - Exhaust	3.7964" (96.43 mm)
Valve Spring	Free Length (Standard)	1.7263” (43.85 mm)
Cylinder	Cylinder - Surface Warp Limit (mating with cylinder head)	0.00098" (0.025 mm)
	Cylinder Bore - Standard	3.8976" ± 0.0003" (99.0 mm ± 0.008 mm)

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CAMSHAFT / CYLINDER HEAD / CYLINDER (IN. / MM)		
	Cylinder Out of Round Limit	0.001" (0.025 mm)
	Cylinder Taper Limit	0.001" (0.025 mm)
	Cylinder to Piston Clearance	0.00019" - 0.00216" (.005 - .055 mm)

PISTON / RINGS / CONNECTING ROD / CRANKSHAFT / BALANCE SHAFT (IN. / MM)			
Piston	Piston - Standard O.D. - Measured 90 degrees to pin, 0.47 in. (12 mm) up from piston skirt. See text.		3.8957" - 3.8968" (98.953 - 98.980 mm)
	Piston Pin Bore I.D. (Standard)		0.8662" - 0.8665" (22.004 - 22.010 mm)
	Piston Pin Bore I.D. (Service Limit)		0.8677" (22.042 mm)
Piston Pin	Piston Pin O.D. (Standard)		0.8659" - 0.8661" (21.995 - 22.000 mm)
	Piston Pin O.D. (Service Limit)		0.8651" (21.975 mm)
Piston Ring	Installed Gap	Top Ring (Standard)	0.0059" - 0.0122" (0.15 - 0.31 mm)
		Top Ring (Service Limit)	0.0137" (0.35 mm)
		Second Ring (Standard)	0.0094" - 0.0196" (0.24 - 0.50 mm)
		Second Ring (Service Limit)	0.0220" (0.56 mm)
		Oil Control Rails (Standard)	0.0098" - 0.0401" (0.25 - 1.02 mm)
		Oil Control Rails (Service Limit)	0.0480" (1.22 mm)
	Ring to Groove Clearance	Top Ring (Standard)	0.0011" - 0.0037" (0.030 - 0.095 mm)
		Top Ring (Service Limit)	0.0042" (0.108 mm)
		Second Ring (Standard)	0.0007" - 0.0029" (0.020 - 0.076 mm)
		Second Ring (Service Limit)	0.0035" (0.089 mm)
Connecting Rod	Small End I.D. (Standard)		0.8665" - 0.8670" (22.010 - 22.023 mm)
	Small End I.D. (Service Limit)		0.8682" (22.053 mm)
	Big End I.D.		See Service Procedure Listed In This Chapter
Crankshaft	Main Journal O.D. (Service Limit)		1.6137" (40.990 mm)
	Crankshaft Runout Limit (PTO and MAG)		See Service Procedure Listed In This Chapter
Balance Shaft	Bearing Journal O.D. (Standard)		1.1798" - 1.1802" (29.969 - 29.979 mm)

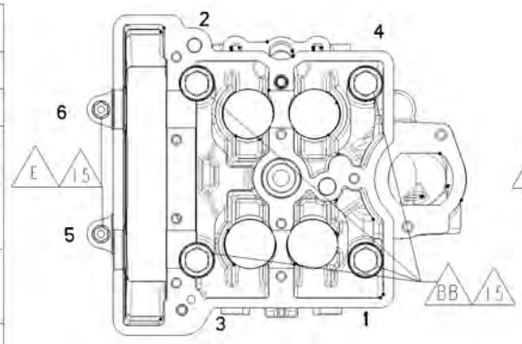
ENGINE DETAIL - TORQUE VALUES / SEQUENCES / ASSEMBLY NOTES

Main Engine Components - Torque Specification and Sequence

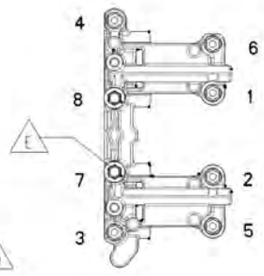
FASTENER TORQUE TABLE	
E	10.00±1.00 N-m
F	12.00±2.00 N-m
BB	1) TORQUE ALL FASTENERS TO 12 Nm IN SEQUENCE SPECIFIED 2) TORQUE ALL FASTENERS TO 35 Nm IN SEQUENCE SPECIFIED 3) COMPLETE 135° IN SEQUENCE SPECIFIED
	35.0±3.5 Nm + 135°±5°
AA	30.0±2.7 Nm MAX # OF RE-TORQUES (QTY) 2

NOTES:

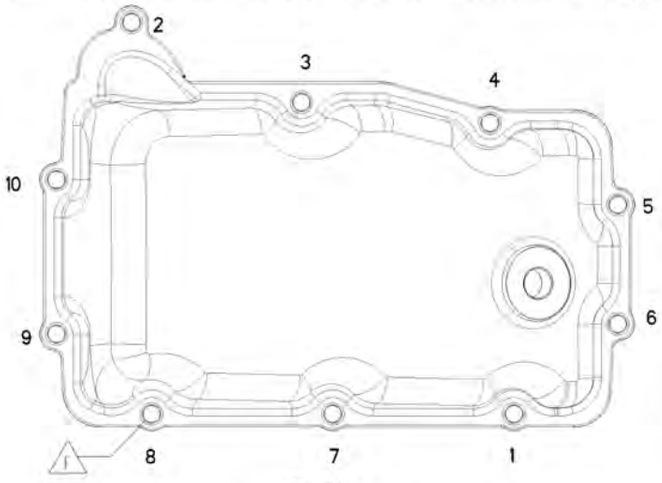
15 TORQUE ONE (1) TIME ONLY. REPLACE IF LOOSENED OR REMOVED.



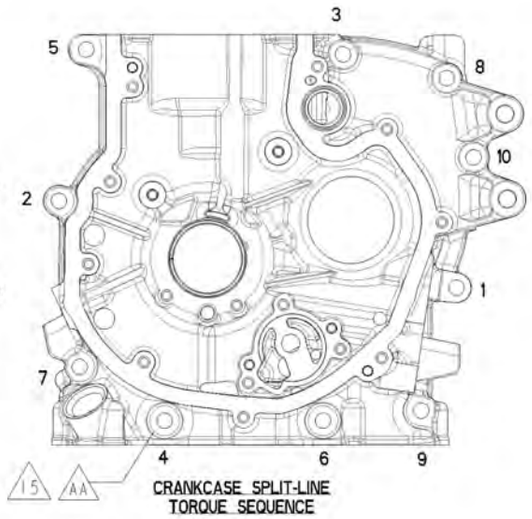
CYLINDER HEAD
TORQUE SEQUENCE



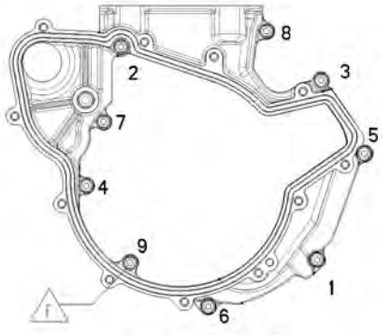
CAM CARRIER
TORQUE SEQUENCE



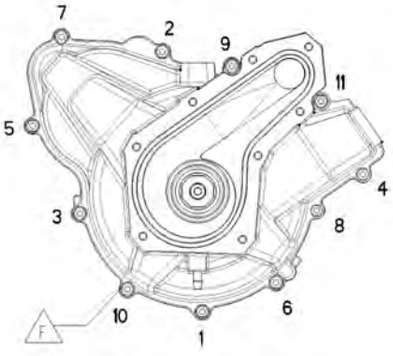
OIL PAN
TORQUE SEQUENCE



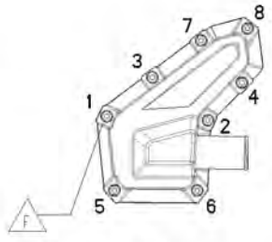
CRANKCASE SPLIT-LINE
TORQUE SEQUENCE



INTER (MAG) COVER
TORQUE SEQUENCE



STATOR COVER
TORQUE SEQUENCE



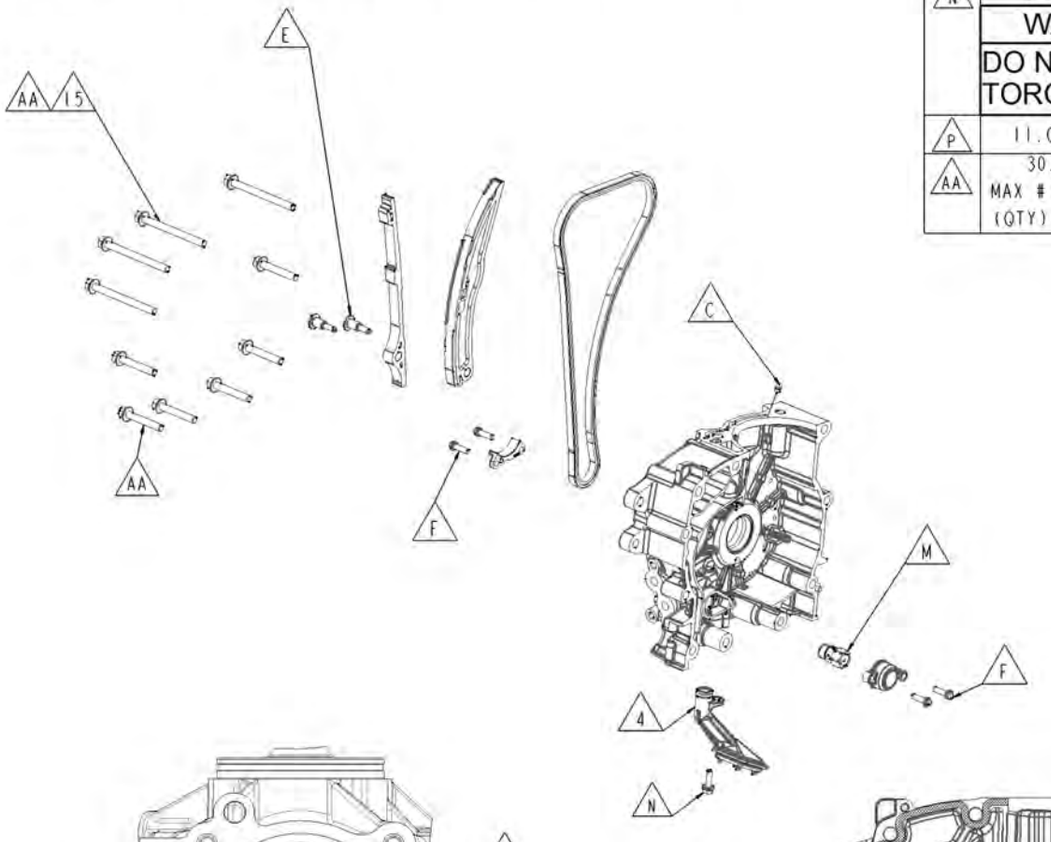
WATER COVER
TORQUE SEQUENCE

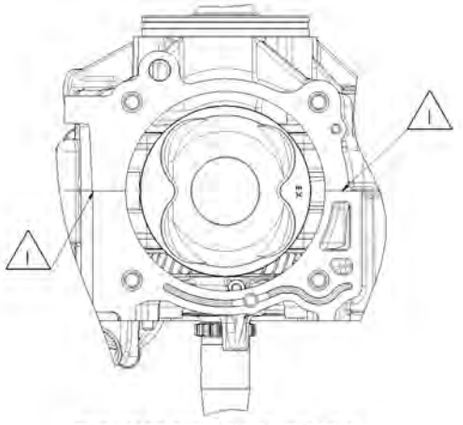
Crankcase / Timing Chain Guides / Oil Pickup / Regulator Valve

NOTES:

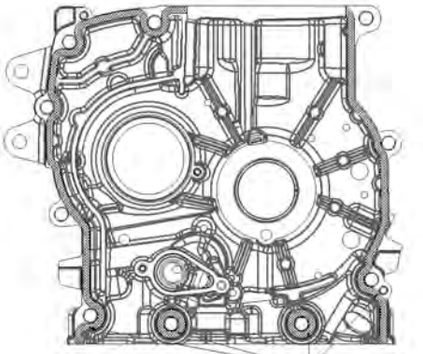
1. REMOVE EXCESS SEALANT FROM DECK SURFACE OF CRANKCASE AFTER ASSEMBLY.
2. CLEAN WITH **ISOPROPYL ALCOHOL** (P/N 8520621). SEAL MATING SURFACES WITH **SEALANT** (P/N 8560061). SEE SEALANT PATH VIEW. SEALANT MUST NOT BLOCK OIL PASSAGES.
4. INSTALL UNTIL FULLY SEATED IN BORE/HOLE. **ENGINE OIL** MAY BE USED TO FACILITATE INSTALLATION.
15. TORQUE ONE (1) TIME ONLY. REPLACE IF LOOSENED OR REMOVED.

FASTENER TORQUE TABLE	
C	4.0±0.4 N-m
E	10.00±1.00 N-m
F	12.00±2.00 N-m
H	22.50±2.50 N-m
M	27.00±3.00 N-m
N	6.75±0.7 N-m WARNING DO NOT EXCEED TORQUE VALUE.
P	11.00±1.00 N-m
AA	30.0±2.7 Nm MAX # OF RE-TORQUES (QTY) 2



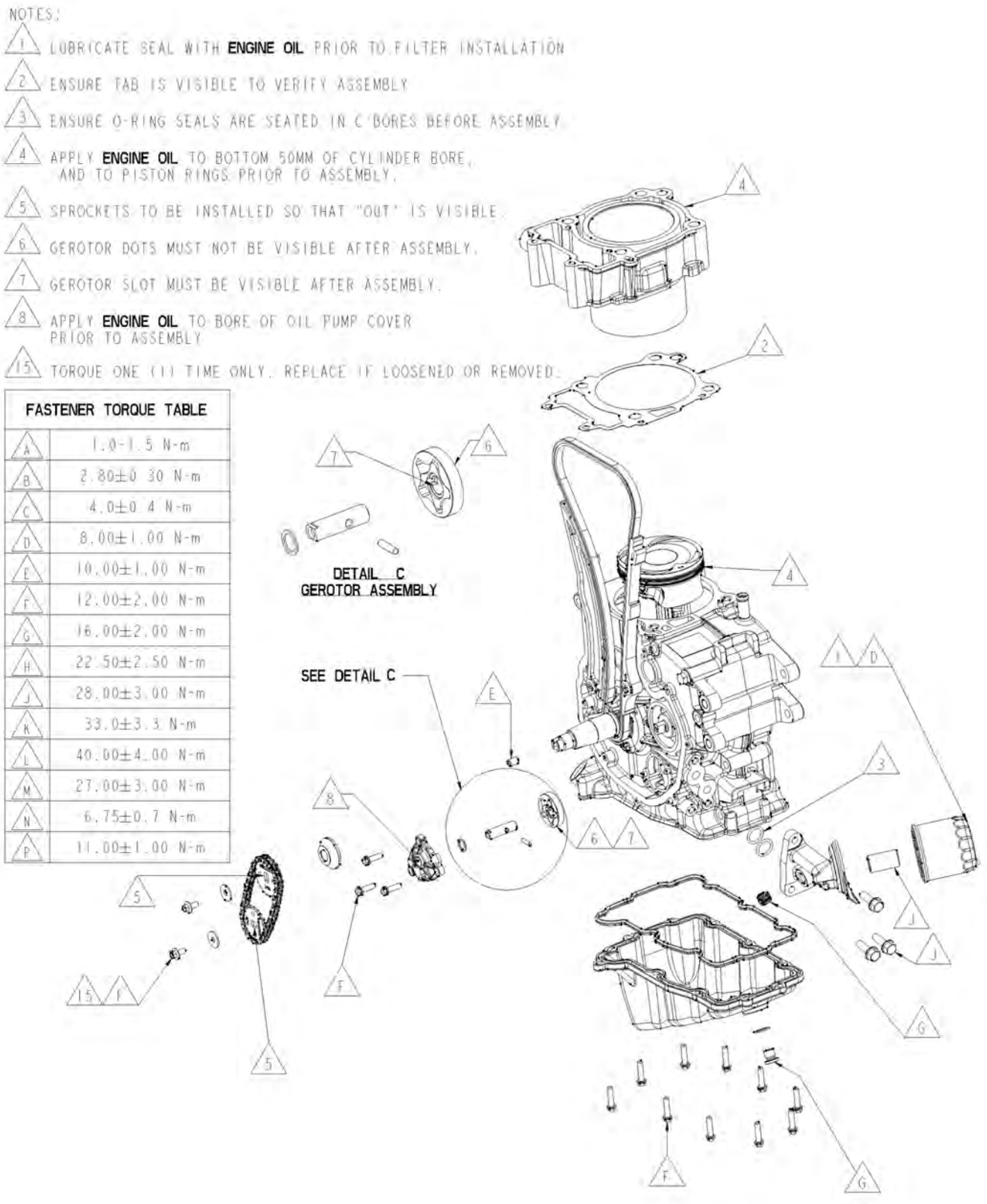


CRANKCASE DECK SURFACE DETAIL



CRANKCASE SPLIT-LINE SEALANT PATH

Cylinder / Oil Filter / Oil Pump / Breather



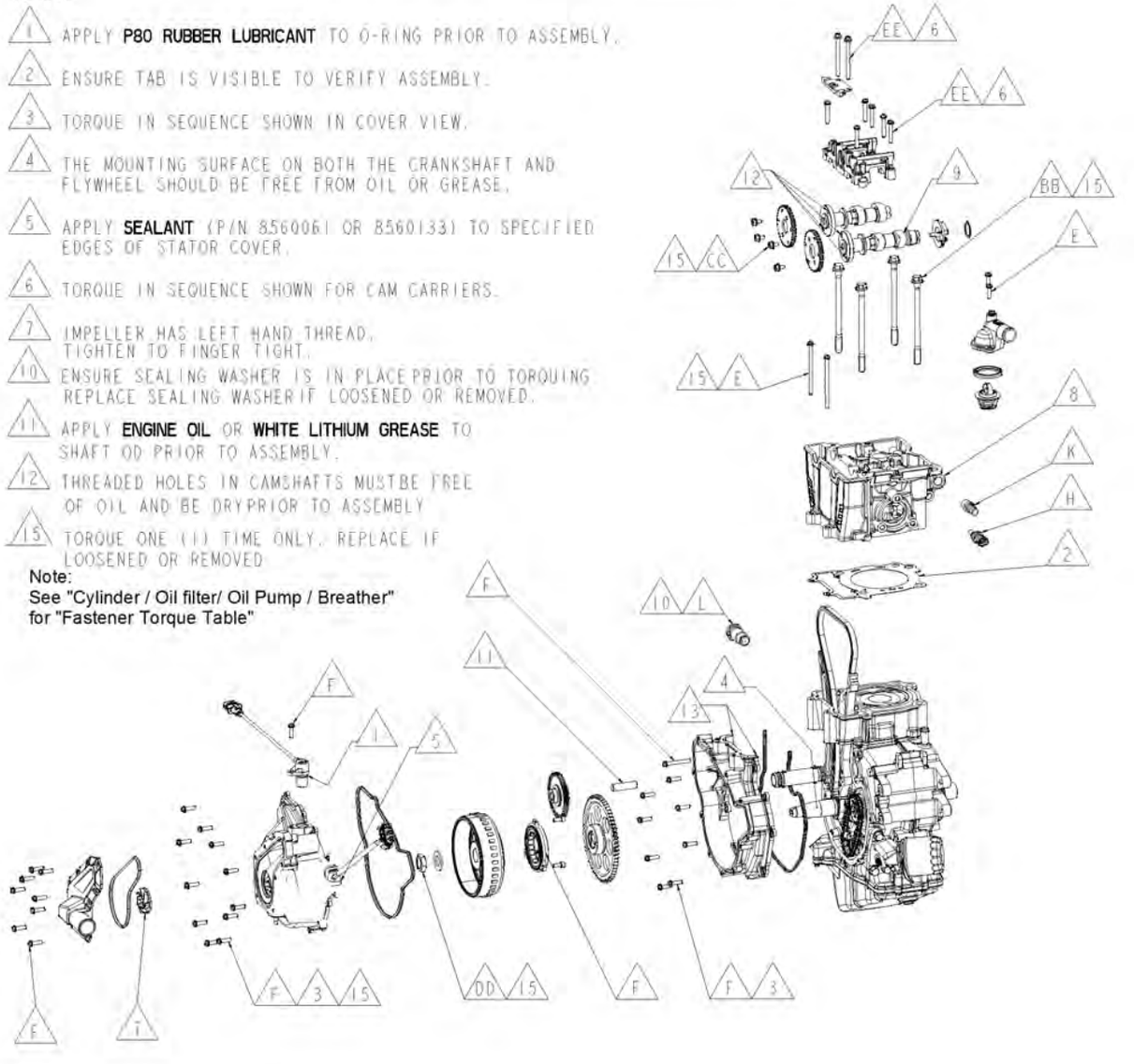
Camshafts / Cylinder Head / Flywheel / Idler Gears / Stator Cover

ENGINEERED JOINT DETAIL		TORQUE OR TORQUE PLUS ANGLE (N•m + DEGREES)	TORQUE PROCESS	SERVICE TORQUE PROCEDURE
HEAD	BB	35.0±3.5 Nm + 135°±5°	1) SIMULTANEOUSLY TORQUE ALL FASTENERS TO 12 Nm 2) SIMULTANEOUSLY TORQUE ALL FASTENERS 28 Nm 3) SIMULTANEOUSLY TORQUE ALL FASTENERS 35 Nm + 135°	1) TORQUE ALL FASTENERS TO 12 Nm IN SEQUENCE SPECIFIED 2) TORQUE ALL FASTENERS TO 35 Nm IN SEQUENCE SPECIFIED 3) COMPLETE 135° IN SEQUENCE SPECIFIED
CAM SPROCKET	CC	19.0±1.0 Nm	MAX SPEED 500 RPM	SAME
FLYWHEEL	DD	180.0±12.0 Nm	NONE	SAME
CAM CARRIER	EE	10.0±1.0 Nm	TORQUE IN SEQUENCE SPECIFIED	SAME

NOTES:

1. APPLY **P80 RUBBER LUBRICANT** TO O-RING PRIOR TO ASSEMBLY.
2. ENSURE TAB IS VISIBLE TO VERIFY ASSEMBLY.
3. TORQUE IN SEQUENCE SHOWN IN COVER VIEW.
4. THE MOUNTING SURFACE ON BOTH THE CRANKSHAFT AND FLYWHEEL SHOULD BE FREE FROM OIL OR GREASE.
5. APPLY **SEALANT** (P/N 8560061 OR 8560133) TO SPECIFIED EDGES OF STATOR COVER.
6. TORQUE IN SEQUENCE SHOWN FOR CAM CARRIERS.
7. IMPELLER HAS LEFT HAND THREAD. TIGHTEN TO FINGER TIGHT.
10. ENSURE SEALING WASHER IS IN PLACE PRIOR TO TORQUING REPLACE SEALING WASHER IF LOOSENED OR REMOVED.
11. APPLY **ENGINE OIL** OR **WHITE LITHIUM GREASE** TO SHAFT OD PRIOR TO ASSEMBLY.
12. THREADED HOLES IN CAMSHAFTS MUSTBE FREE OF OIL AND BE DRYPRIOR TO ASSEMBLY
15. TORQUE ONE (1) TIME ONLY. REPLACE IF LOOSENED OR REMOVED

Note:
See "Cylinder / Oil filter/ Oil Pump / Breather" for "Fastener Torque Table"



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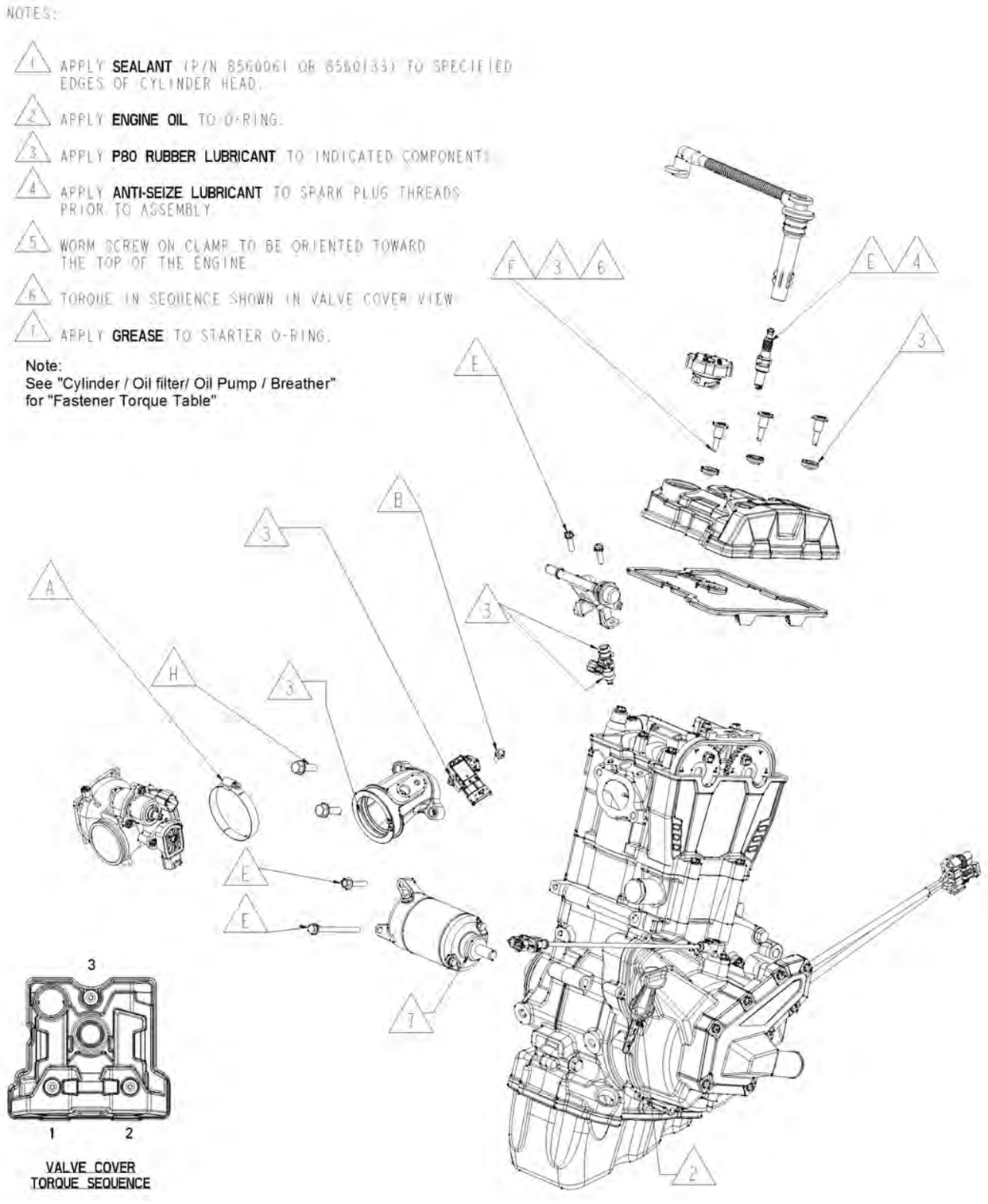
Spark Plugs / Starter / Throttle Body / Valve Cover



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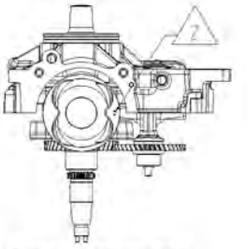
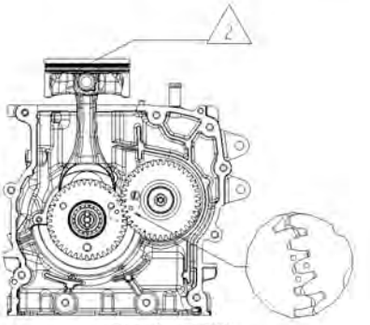
Piston / Crankshaft / Balance Shaft

NOTES

1. CLEAN CRANKCASE BORE WITH **ISOPROPYL ALCOHOL** PRIOR TO ASSEMBLY OF SEAL. DO NOT LUBRICATE CRANKCASE SEAL OD.
2. CIRCLIP MUST BE INSTALLED WITH GAP AT 6:00 OR 12:00 POSITION. CHECK PREVIOUSLY INSTALLED CIRCLIP TO ENSURE THAT THE GAP IS THE SAME. "EX" MARKING ON PISTON TO BE ORIENTED TOWARDS EXHAUST SIDE OF ENGINE.
3. CLEAN WITH **ISOPROPYL ALCOHOL** (P/N 8520621). SEAL MATING SURFACES WITH SEALANT (P/N 8560961).
4. CRANKSHAFT TO BE DRAWN THROUGH BEARINGS IN PTO CASE WITHOUT SIDE LOADING THE BEARING BALLS. BEARING INNER RACE TO BE SUPPORTED DURING INSTALLATION. MINIMUM AXIAL LOAD TO BE APPLIED TO SEAT THE CRANK IN BEARINGS IS 13.3 kN.
5. ALIGN GEARS TO GEAR TIMING MARKS. VIEW BELOW.
6. PRESS UNTIL FLUSH ±0.25mm WITH END OF CRANKCASE.
7. APPLY **ENGINE OIL** OR **WHITE LITHIUM GREASE** TO BEARING SURFACES AND/OR BORE.
8. CRANKSHAFT MUST BE INSTALLED PRIOR TO SEAL INSTALLATION.
11. UNLESS OTHERWISE SPECIFIED, LUBRICATE ALL O-RING BEFORE ASSEMBLY WITH **ENGINE OIL**, **WHITE LITHIUM BASED GREASE** OR **P-80 RUBBER LUBRICANT**.
12. INSTALL UNTIL BOTTOMED IN BORE/HOLE.
13. BEARINGS MUST ROTATE FREELY AFTER ASSEMBLY.
14. APPLY LOAD TO OUTER RACE ONLY.
15. TORQUE ONE (1) TIME ONLY. REPLACE IF LOOSENED OR REMOVED.

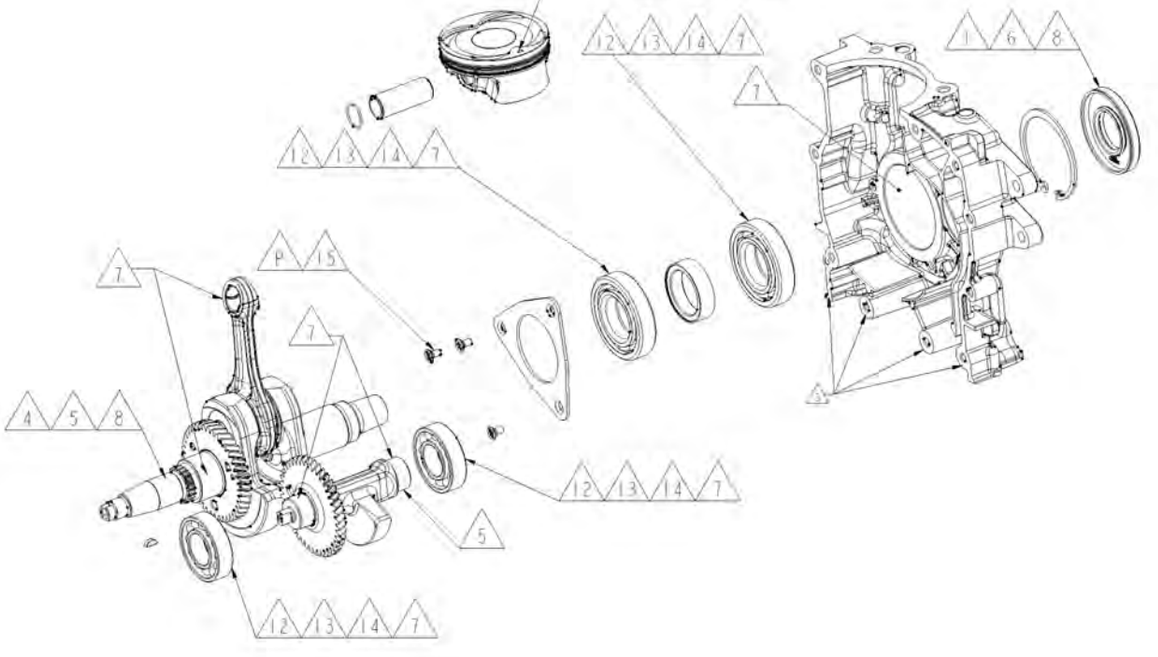


PISTON ORIENTATION



TIMING MARKS
BALANCE SHAFT GEAR ALIGNMENT
VIEWED FROM MAG SIDE
PISTON AT TDC

CIRCLIP ORIENTATION



ENGINE COOLING SYSTEM

Cooling System Specifications

CONDITION	COOLANT TEMPERATURE °F (°C)
Room Temperature	68° F (20° C)
Thermostat Open	180° F (82° C)
Fan Off	192° F (89° C)
Fan On	198° F (92° C)
Thermostat Full Open Lift	203° F (95° C)
Engine Temperature Overheat Indicator	233° F (112° C)
Engine Protection Ignition Misfire	236° F (113° C)
Engine Protection Shutdown	257° F (125° C)

ITEM	SPECIFICATION
Cooling System Capacity	4.25 qts. (4 l)
Pressure Cap Relief	13 PSI

Polaris Premium Antifreeze:
2871534 - Quart
2871323 - Gallon

Recommended Coolant

Use only high quality antifreeze/coolant mixed with distilled water in a 50/50 or 60/40 ratio, depending on freeze protection required in your area.

CAUTION: Using tap water in the cooling system will lead to a buildup of deposits which may restrict coolant flow and reduce heat dissipation, resulting in possible engine damage. Polaris Premium 60/40 Antifreeze/ Coolant is recommended for use in all cooling systems and comes pre-mixed, ready to use.

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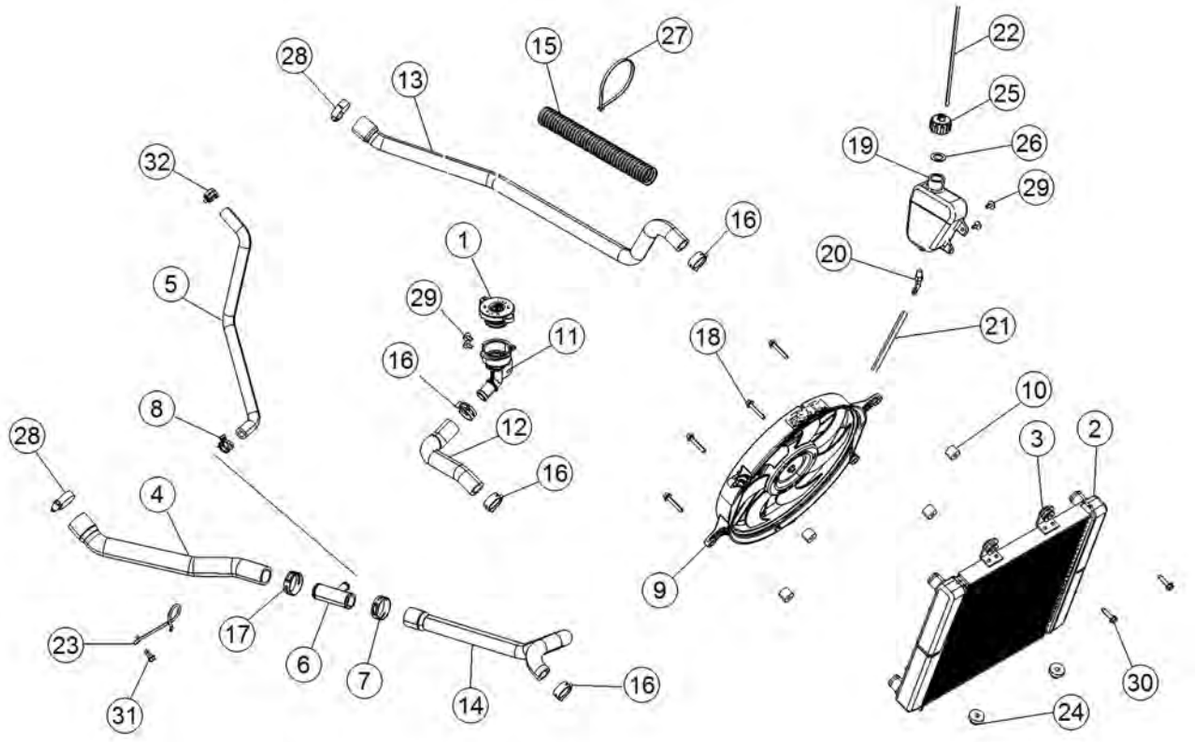
Cooling System Exploded View and Coolant Flow Diagram

REF.	PART DESCRIPTION	NOTE	REF.	PART DESCRIPTION	NOTE
1	CAP, PRESSURE	13 psi	17	CLAMP, SPRINGBAND, BLACK	
2	ASM., RADIATOR		18	SCREW	
3	ASM., GROMMET AND INSERT		19	TANK, SURGE	
4	HOSE, ENGINE, LOWER		20	FITTING, BARBED, 90 DEG	
5	HOSE, BYPASS, FORMED		21	HOSE, CLEAR	
6	CONNECTOR, TEE		22	LINE, FUEL	
7	CLAMP, SPRINGBAND, BLACK		23	SPRING, COOLANT HOSE GUIDE	
8	CLAMP, HOSE, SPRING		24	BUSHING, MOUNT, LOWER RADIATOR	
9	ASM., FAN AND MOTOR		25	CAP, OVERFLOW BOTTLE W/FITTING	
10	SPACER		26	GASKET, OVERFLOW CAP	
11	NECK, FILLER		27	CABLE TIE	
12	HOSE, FILLER NECK		28	CLAMP, HOSE	
13	HOSE, RADIATOR, UPPER		29	SCREW	36 in-lbs ± 10%
14	HOSE, RADIATOR, LOWER		30	SCREW	6 ft-lbs ± 10%
15	CONDUIT, FLEX		31	SCREW	
16	CLAMP, SPRINGBAND, GREEN		32	CLAMP, HOSE	



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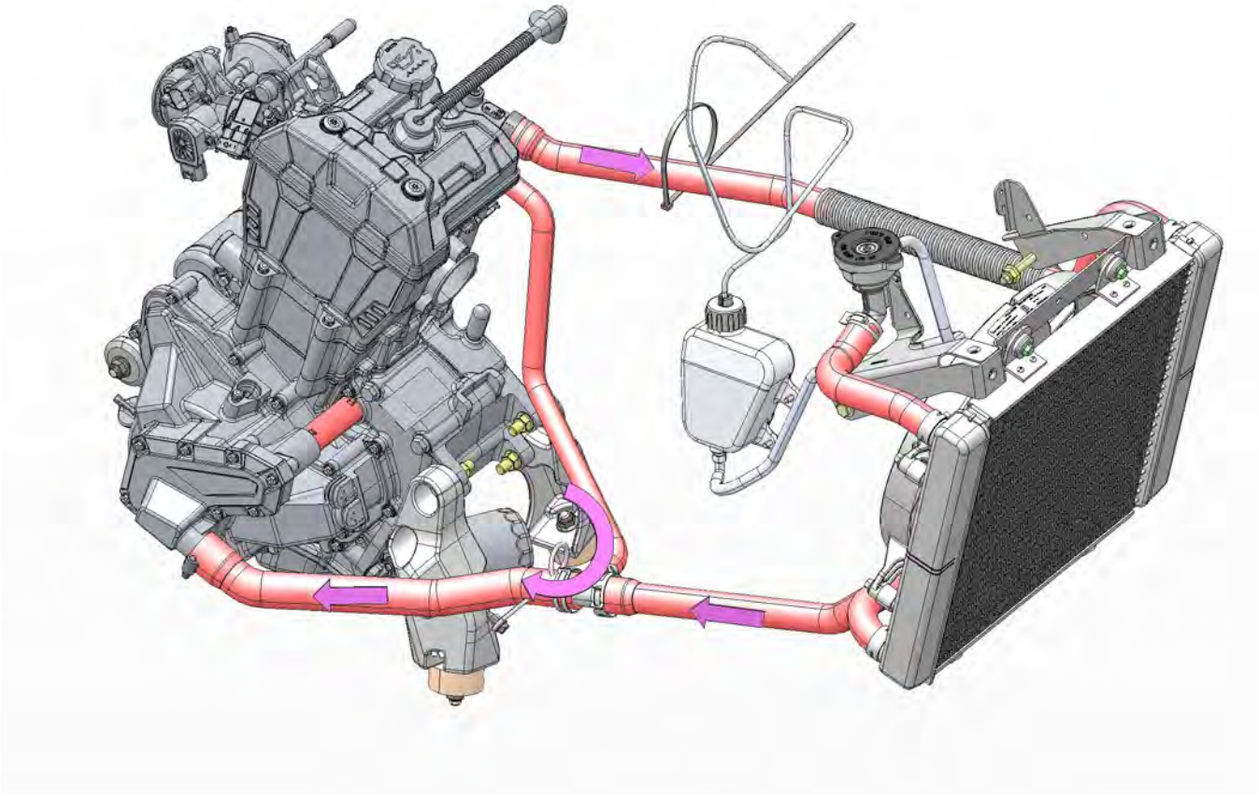
Coolant Flow



Cooling System Pressure Test

1. Remove the center cover under the front rack.

WARNING

Never remove pressure cap when engine is warm or hot. The cooling system is under pressure and serious burns may result.
Allow the engine to cool before servicing.

2. Remove pressure cap and pressure test the cooling system using a commercially available pressure tester.
3. The system must maintain 10 psi for five minutes or longer. If pressure loss is evident within five minutes, check the filler neck, radiator, hoses, clamps and water pump weep hole for leakage.

Pressure Cap Test

1. Remove the hood from the front cab (see “WARNING” under “Cooling System Pressure Test”).
2. Remove pressure cap (A) and test using a pressure cap tester (commercially available).
3. The pressure cap relief pressure is 13 psi. Replace cap if it does not meet this specification.

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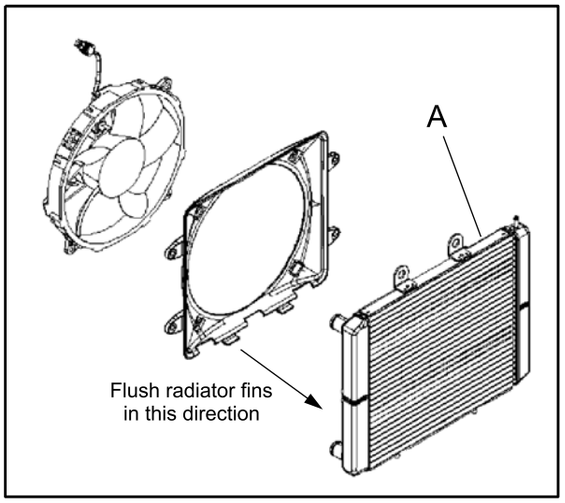
Radiator

1. Check radiator (A) air passages for restrictions or damage.



2. Carefully straighten any bent radiator fins.
3. Remove any obstructions with compressed air or low pressure water.

CAUTION

Washing the vehicle with a high-pressure washer could damage the radiator fins and impair the radiators effectiveness. Use of a high-pressure washer is not recommended.

Coolant Drain / Radiator Removal

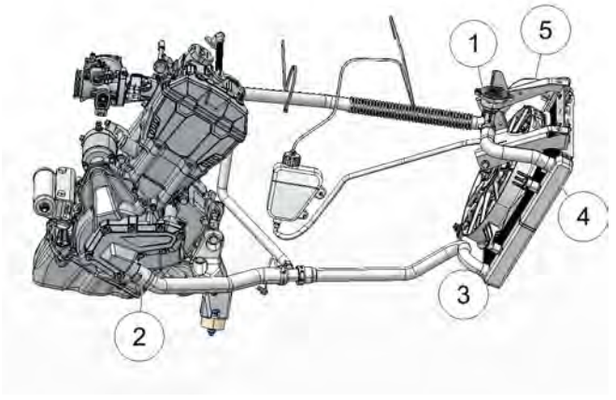
Coolant Drain

1. Remove the center cover from the front cab.

WARNING

Never drain the coolant when the engine and radiator are warm or hot. Hot coolant can cause severe burns. Allow engine and radiator to cool.

2. Slowly remove the pressure cap (1) to relieve any cooling system pressure.



3. Place a suitable drain pan underneath the water pump inlet housing on the front right-hand side of the vehicle.
4. Drain the coolant from the cooling system by removing the lower coolant hose from the water pump housing then the lower radiator outlet (2) as shown. Properly dispose of the coolant.
5. Allow coolant to completely drain.
6. Place a suitable drain pan underneath the lower engine hose on the right-hand rear side of the vehicle.
7. Remove the hose and completely drain the engine.

Radiator Removal

1. Remove the front bumper.
2. Remove the upper engine outlet hose and recovery hose from the top of the radiator.

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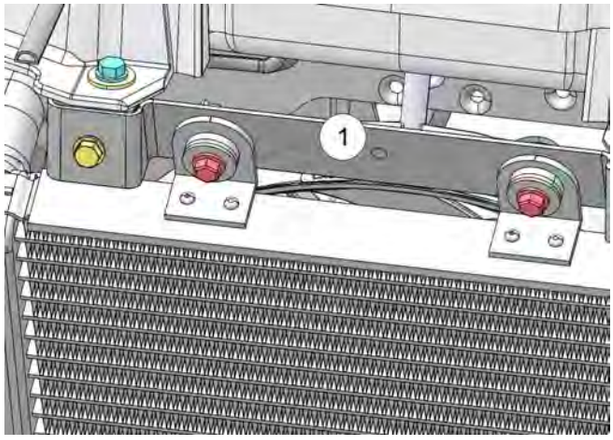
3. Remove the upper radiator retaining bolts and the bolts retaining the lower radiator mount bracket. Remove the bracket from the frame.



4. Disconnect the fan motor and remove the radiator from the vehicle. Take care not to damage the cooling fins.
5. Reverse procedure for installation.

Thermostat Replacement

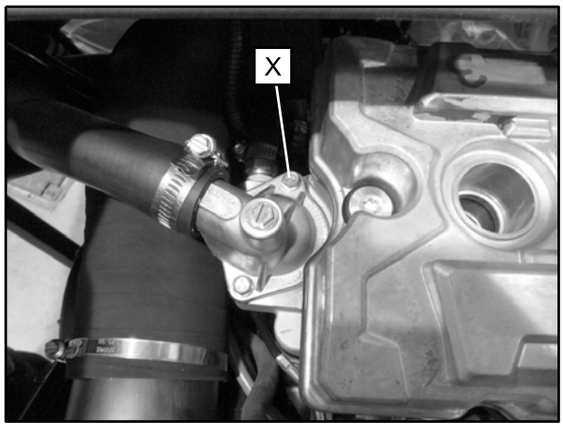
1. Remove the left side panel and PVT intake / exhaust ducting as required.

⚠ WARNING

The cooling system is under pressure and serious burns may result.

Allow the engine to cool before servicing.

2. Remove front rack , front cab and fuel tank . (not required for touring models)
3. Remove the pressure cap to relieve any system pressure (see “Pressure Cap Test”).
4. Drain coolant to a level below the thermostat housing.
5. Remove the spark plug wire from the engine.
6. Remove the (2) bolts (X) retaining the thermostat cover.



NOTE: Image For Reference Only.

7. Lift the cover from the engine and remove the thermostat.
8. Reverse this procedure for installation. Replace thermostat seal if worn or damaged. Torque thermostat cover bolts to specification.

= T

Thermostat Cover Bolts:
7.5 ft-lbs (10 Nm)

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9. Be sure to properly fill and bleed cooling system as outlined in this chapter.

Cooling System Bleeding Procedure

⚠ WARNING

Always wear safety glasses and proper shop clothing when performing the procedures in this manual. Failing to do so may lead to possible injury or death.

Use caution when performing these procedures. Coolant may be hot and may cause severe injury or burns.

If the coolant level is LOW in the radiator, or if there are leaks in the system, the coolant system will not draw coolant from the reservoir tank.

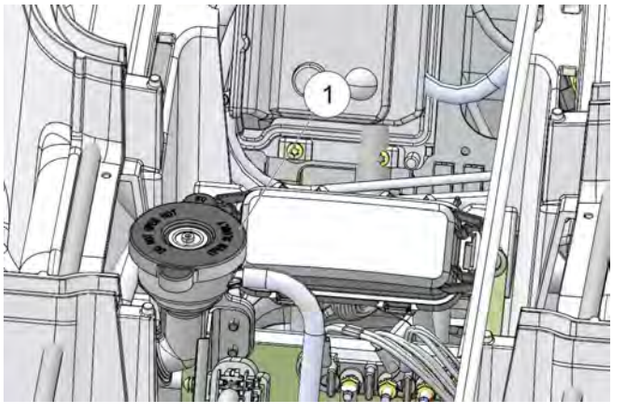
It may be necessary to safely raise the front of the vehicle 12” (30 cm) to bleed the cooling system.

1. Allow engine and cooling system to completely cool.

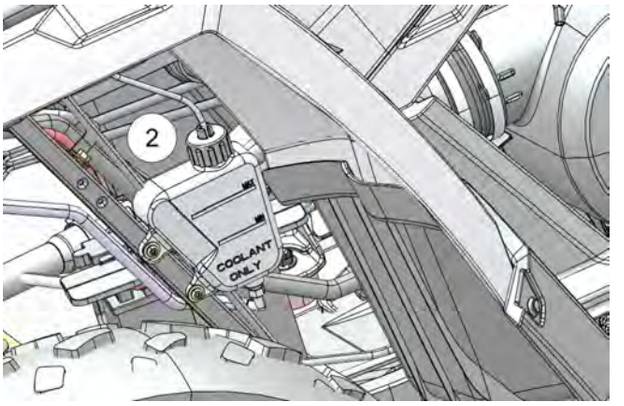
⚠ CAUTION

Be sure the engine has cooled and no pressure is built up in the cooling system before removing the pressure cap. The coolant may be hot and could cause severe injury or burns.

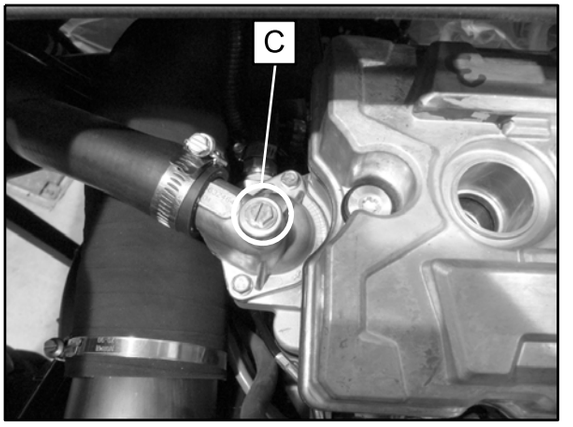
2. Remove Left side panel, required PVT ducting and Center panel under the front rack.
3. Remove the pressure cap (1) and add the necessary amount of Polaris Premium Antifreeze to the radiator filler neck.



4. Remove the recovery bottle cap (2) and fill the bottle to the MAX line.



5. Remove the cargo box access cover to gain access to the coolant bleed screw that is on top of the thermostat housing.
6. Open the bleed screw (C) to allow any trapped air to escape.
7. Fill the radiator until a steady stream of coolant begins to drain out of the bleed screw (C).



8. Tighten the bleed screw to specification, top off coolant and properly install the pressure cap.

= T
Coolant Bleed Screw: **6 ft-lbs (8 Nm)**

9. Start the engine and allow it to idle until the coolant fan has cycled.
10. Allow engine and cooling system to completely cool down (see CAUTION).

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11. Remove the pressure cap. Add the necessary amount of Polaris Premium Antifreeze to the radiator filler neck.
12. Open the bleed screw to allow any trapped air to escape. Close the bleed screw once a steady stream of coolant begins to drain out.
13. Tighten the bleed screw to specification, top off coolant and properly install the pressure cap.

= T
Coolant Bleed Screw: **6 ft-lbs (8 Nm)**

14. Fill the recovery bottle to the MAX line.
15. Reinstall the Left side panel, required PVT ducting and Center panel under the front rack.

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WATER PUMP SERVICE

Water Pump Cover and Impeller Service (Stator Cover Remains on Engine)

NOTE: The water pump cover, gasket and impeller can be serviced with the stator cover installed on the engine.

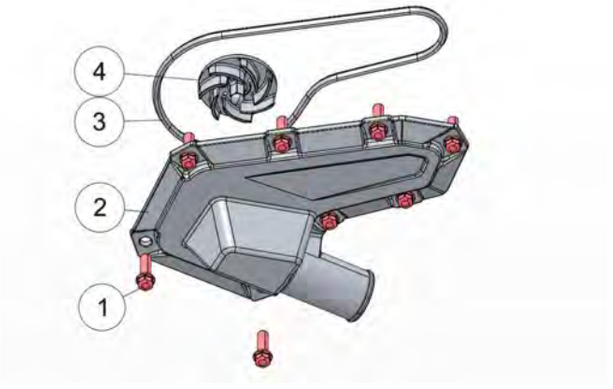
1. Allow engine and cooling system to completely cool.

⚠ CAUTION

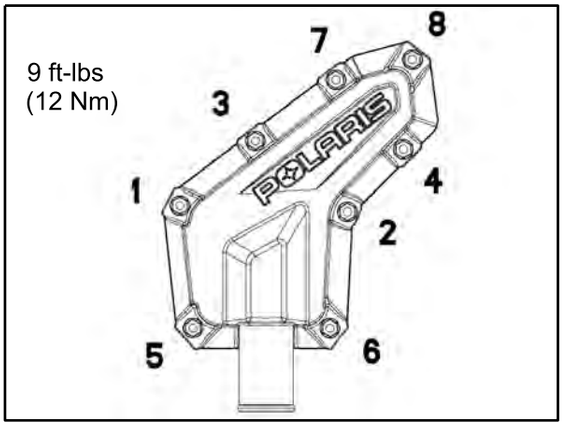
Be sure the engine has cooled and no pressure is built up in the cooling system before removing the pressure cap. The coolant may be hot and could cause severe injury or burns.

2. Remove the seat, right side panel, and right footwell.
3. Disconnect the (-) negative battery cable.
4. Remove all debris and thoroughly clean water pump area and right-hand side of engine block.
5. Remove the Center cover under the front rack.
6. Remove the pressure cap from the filler neck.
7. Completely drain cooling system and engine as outlined in this chapter.
8. Remove the bolts(1) attaching the water pump cover to the stator cover.
9. Remove the water pump cover (2) and water pump cover gasket (3). Discard the water pump gasket (3).
10. Using an 8mm socket, remove the water pump impeller (4).

    NOTE: The water pump impeller (4) uses reverse (LH) threads.



11. Inspect the water pump cover and impeller for damage. Replace as necessary.
12. Follow this procedure in reverse to assemble the water pump impeller and cover. Always use a *new* water pump cover gasket(3). Torque all fasteners in sequence to specification.



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Water Pump Cover Fastener:
9 ft-lbs (12 Nm)

13. Fill and bleed cooling system as outlined in this chapter.

Water Pump Mechanical Seal / Oil Seal Replacement

Removal

NOTE: The stator cover must be removed from the engine to service the water pump drive shaft, oil seal, mechanical seal and bearing.

1. Allow engine and cooling system to completely cool.

CAUTION

Be sure the engine has cooled and no pressure is built up in the cooling system before removing the pressure cap. The coolant may be hot and could cause severe injury or burns.

2. Remove the seat, right side panel and footwell.
3. Disconnect the (-) negative battery cable.
4. Remove all debris and thoroughly clean water pump area and right-hand side of engine block.
5. Remove the center cover under the front rack.

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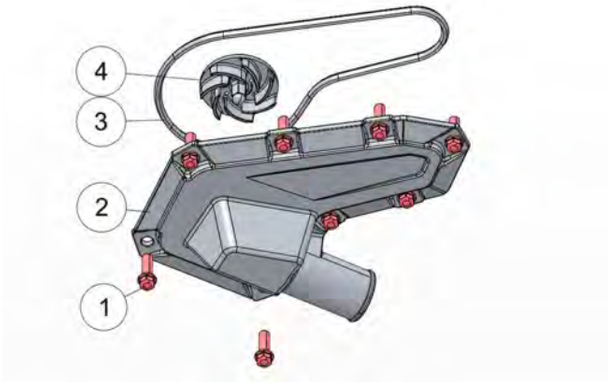
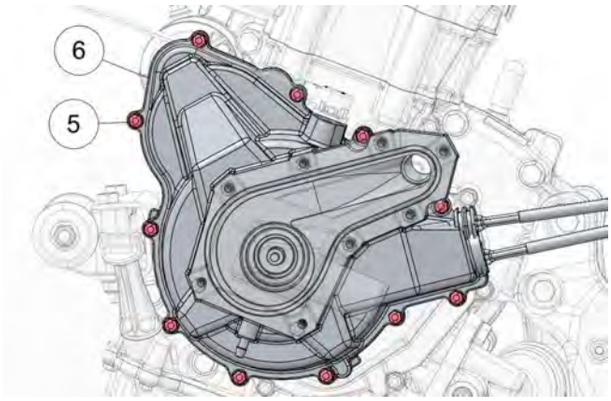
6. Remove the pressure cap from the filler neck.
7. Completely drain cooling system and engine as outlined in this chapter.
8. Disconnect the stator wire connector and unsecure the wiring from the front engine mount bracket.
9. Remove the CPS sensor from the stator cover on the right-hand side of the engine. Inspect CPS O-ring and replace if needed.
10. Remove the oil dipstick.
11. Remove the bolts (1) retaining the water pump cover to the stator cover.
12. Remove the water pump cover (2) and water pump cover gasket (3). Discard the water pump gasket (3).
13. Remove the water pump impeller (4).

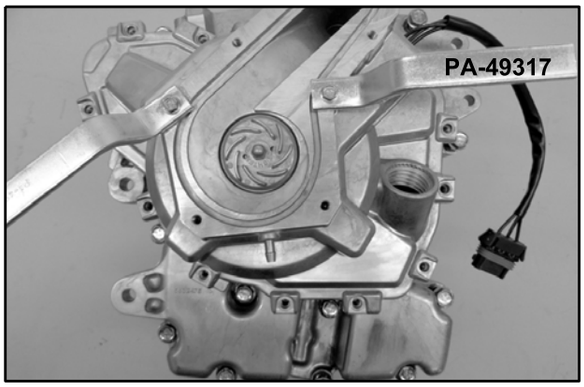
    NOTE: The water pump impeller (4) uses reverse (LH) threads.



14. Remove the bolts (5) securing the stator cover (6) to the engine.



15. If needed, install the stator cover removal handle tool (PA-49317) to the water pump cover bolt holes to aid in stator cover removal.



NOTE: Image For Reference Only.

CAUTION

The flywheel contains powerful magnets. Use caution when removing the stator cover.
DO NOT place fingers between cover and crankcase at any time during the removal process or injury could result.

16. Remove and discard the stator cover gasket.

CAUTION

Be sure engine coolant does not contaminate the engine oil during stator cover service.

17. Bring the stator cover assembly to a clean work bench.

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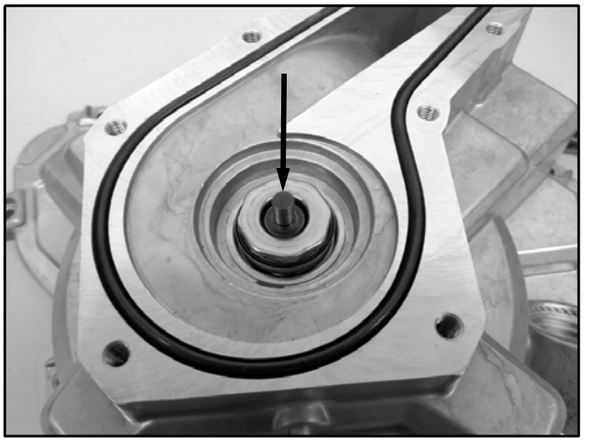
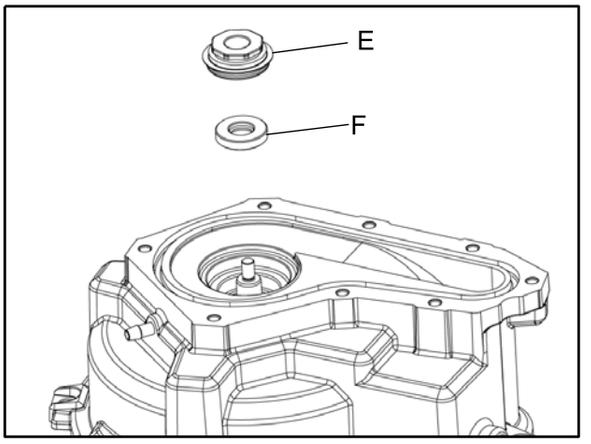
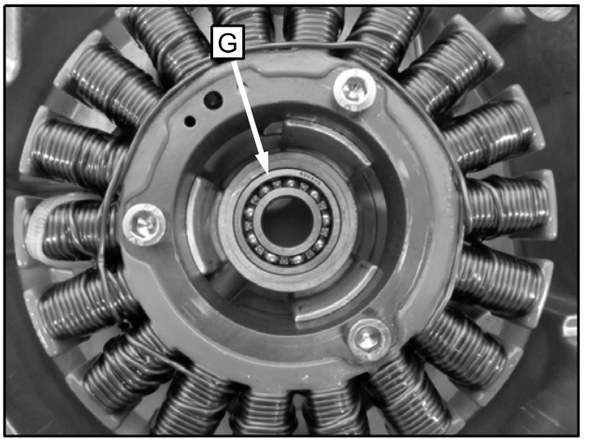
18. Using a brass drift, remove the water pump drive shaft. Be sure not to damage the threads. Inspect shaft for wear or damage, replace if necessary.



19. Extract the mechanical seal (E) and the oil seal (F) from the stator cover.



20. Press out the water pump drive shaft bearing (G) from the stator cover. Discard bearing and replace with new.



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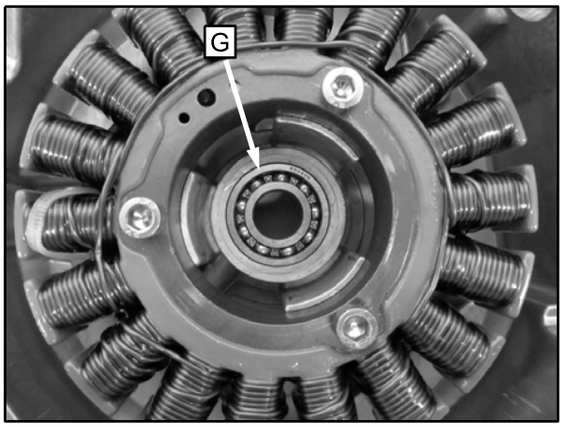
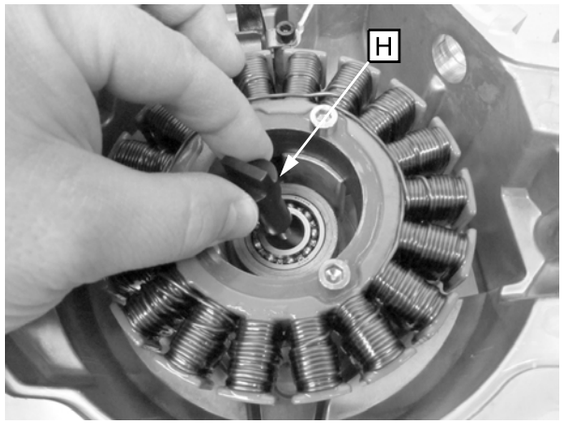
Water Pump Assembly

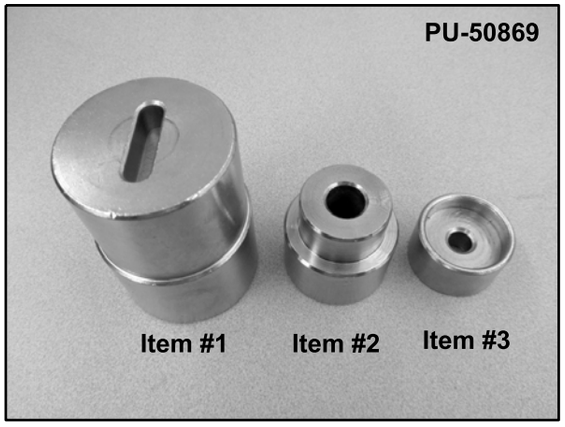
1. Thoroughly clean the stator cover.
2. Press in a *new* water pump drive shaft bearing (G) until it is fully seated in the cover.

CAUTION
Be sure bearing is fully seated in cover or severe engine damage may result.



3. Clean and de-grease the water pump drive shaft (H).
4. Press in the water pump drive shaft (H) into the bearing using PU-50869 Item #1.





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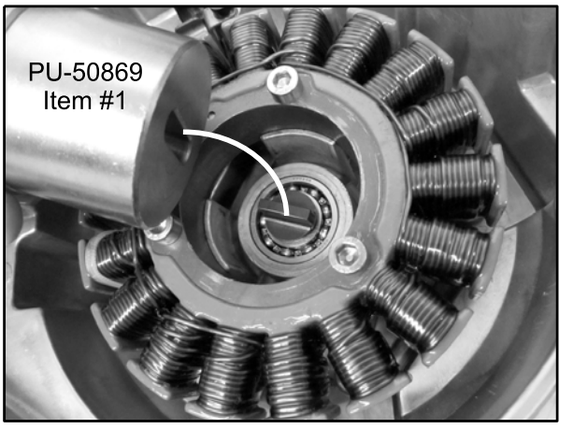
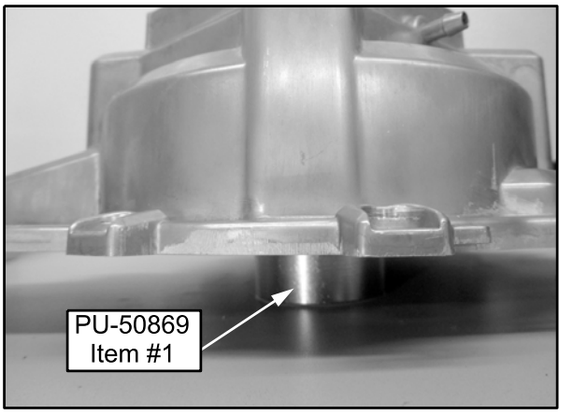
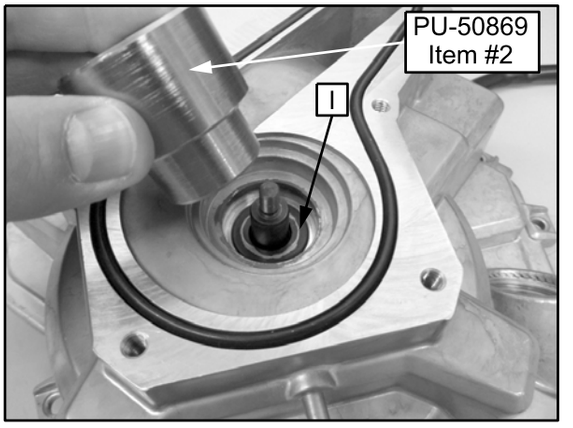
5. Install the water pump drive shaft holding tool (Item #1) in kit PU-50869. Hold the tool in position and flip the assembly up-side-down so the special tool PU-50869 is supporting the assembly.





6. Lubricate the *new* water pump oil seal with clean engine oil.

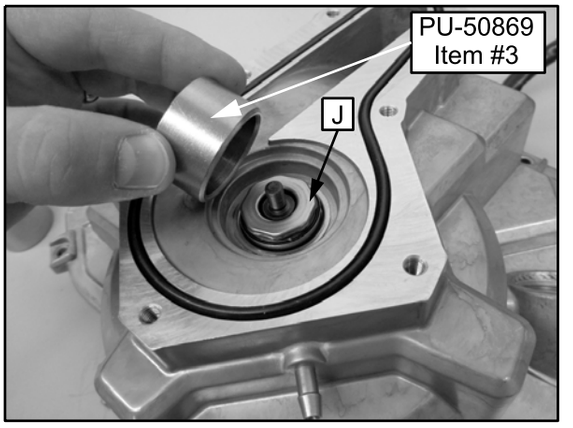
7. Use the water pump oil seal installation tool in kit PU-50869 to fully install the *new* water pump oil seal (I).



⚠ CAUTION

Be sure the oil seal is fully seated in cover or severe engine damage may result

8. Use the water pump mechanical seal installation tool in kit PU-50869 to fully install the *new* water pump mechanical seal (J) until it is fully seated in the cover.



9. Install a *new* stator cover gasket onto the engine.

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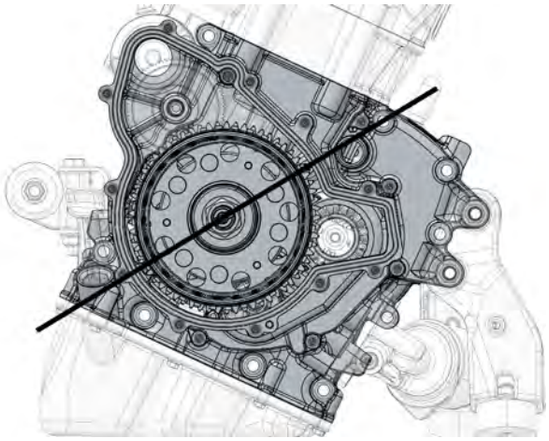
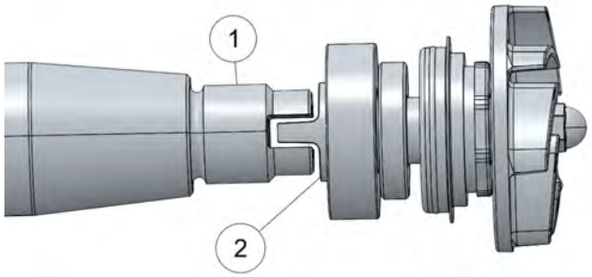
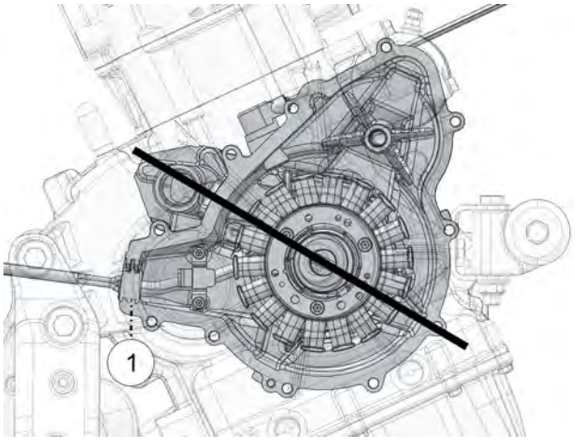
10. Align the water pump drive slot as shown below.



IMPORTANT: The crank shaft and water pump drive shaft must me aligned for the case to be assembled.



11. Align the water pump drive shaft blade as shown below.
12. Apply a small amount of crankcase sealant to the area indicated below (1).



13. If needed, install the stator cover removal handles tool PA-49317 to the water cover bolt holes to aid in stator cover installation.
14. While installing the stator cover to the engine, slightly rotate the water pump impeller to verify the crankshaft slot and the water pump drive shaft blade are properly engaged. Verify the stator cover is laying flat on the engine case.

NOTE: Image for Reference Only.

CAUTION

The flywheel contains powerful magnets. Use caution when installing the stator cover.
DO NOT place fingers between cover and crankcase at any time during the removal and installation process or injury could result.

CAUTION

If the water pump drive shaft blade and slot in the crank shaft are not in alignment during the installation process, severe engine damage may result.

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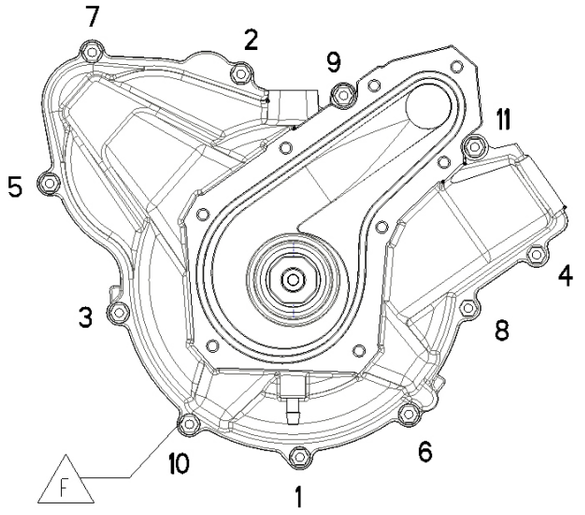
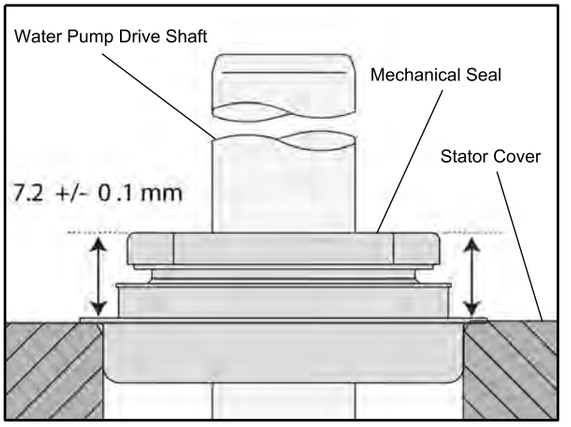
15. Install and torque the stator cover fasteners in sequence to specification.

= T
Stator Cover and Water Pump Cover: **9 ft-lbs (12 Nm)**



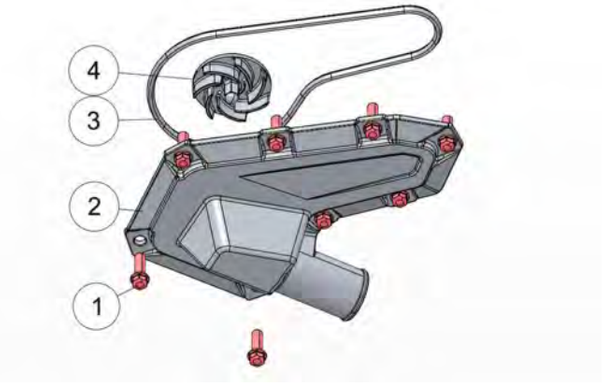
STATOR COVER
TORQUE SEQUENCE

16. Measure the installed height of the *new* mechanical seal as shown below. If not within specification, remove and discard the mechanical seal and properly install new mechanical seal as outlined in this chapter.



= In. / mm.
Mechanical Water Pump Seal Installed Height: 0.280” - 0.287” (7.2 +/- 0.1 mm)

17. Install the water pump impeller (4).



NOTE: The water pump impeller (4) uses reverse (LH) threads. Finger tighten only.

18. Install a *new* water pump cover gasket.

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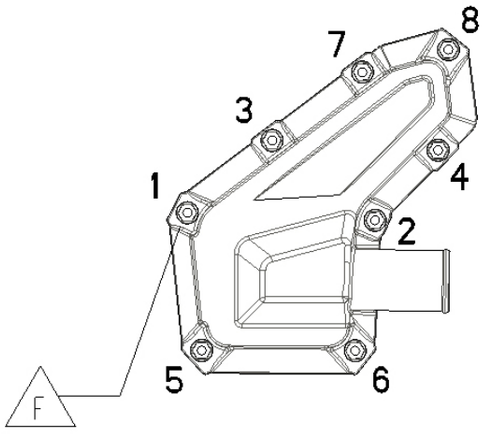
19. Install the water pump cover to the stator cover. Torque all fasteners in sequence to specification.

= T
Stator Cover and Water Pump Cover: **9 ft-lbs (12 Nm)**



WATER COVER
TORQUE SEQUENCE

20. Install the oil dipstick.
21. Install the coolant hose to the water pump cover and tighten hose clamp.
22. Connect the stator wire connector and securing the wiring to the front engine mount bracket.
23. Install the CPS sensor into the stator cover. Inspect CPS O-ring and replace if needed.
24. Install the seat, right side panel and footwell.
25. Connect the (-) negative battery cable.
26. If the engine oil was contaminated during this service procedure, perform an engine oil change as outlined in Chapter 2. DO NOT run the engine until coolant has been added to the cooling system.
27. Fill cooling system with recommend coolant and bleed the system of air as outlined in this chapter.
28. Check for leaks.

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ENGINE SERVICE

Accessible Engine Components

The following components can be serviced or removed with the engine installed:

- Camshaft
- Camshaft Sprockets
- Cylinder Head and Gaskets
- Cylinder and Gaskets
- Piston and Rings
- Flywheel
- Starter Motor / Idler Gear Asm
- Stator (Alternator)
- Thermostat
- Valve Cover
- Water Pump
- Camshaft Timing Chain and Guides
- Crankshaft Seal (PTO)
- Oil Pump / Oil Pump Sprocket or Chain

The following components require engine removal for service:

- Counterbalance Shaft and Bearings
- Crankshaft and Bearings
- Crankcase
- Oil Pressure Regulator
- Oil Pump Pickup Assembly

Top-End Service (Engine in Chassis)

ALL of the top-end engine components can be serviced while the engine is mounted in the chassis.

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Engine Removal

NOTE: Some engine repair procedures can be performed without removing the engine assembly from the vehicle. Refer to "Accessible Engine Components" for further information.

The use of an overhead or portable engine hoist is the only recommended method for removing and installing the engine.

Have an assistant help guide the engine in and out of the vehicle while using an engine hoist to prevent personal injury or damage to vehicle components.

Drive Clutch Puller P/N PA-48595

WARNING

Always wear safety glasses and proper shop clothing when performing the procedures in this Service Manual.
Failing to do so may lead to possible injury.

1. If vehicle was recently operated, allow it to cool down before attempting to perform any work.
2. Thoroughly clean the engine and chassis.
3. Disconnect the (-) negative battery cable from the battery prior to engine removal. (see Battery Removal, page 2.32)
4. Drain the engine oil (See Oil and Filter Change , page 2.16) and engine coolant (See Coolant Drain / Fill, page 2.26) prior to engine removal.
5. Remove the seats, footwells, side panels, front cab and fuel tank. (see BODY, page 5.3and Fuel Tank Removal, page 4.20)

   NOTE: Removal of the front cab is not required for touring models.

   Remove the right passenger footwell on touring models when performing engine removal.
6. Remove the PVT inlet and exhaust ducts. (See PVT Sealing And Ducting Components, page 6.8)

7. Remove the outer clutch cover, drive belt, drive clutch, driven clutch and inner clutch cover.

   NOTE: Be sure to use the correct Drive Clutch Puller (PA-48595) to prevent damage to crankshaft.
8. Remove the fasteners retaining the airbox and the airbox top.
9. Loosen the crank case ventilation hose (1) and disconnect it from the engine (note routing for reassembly).

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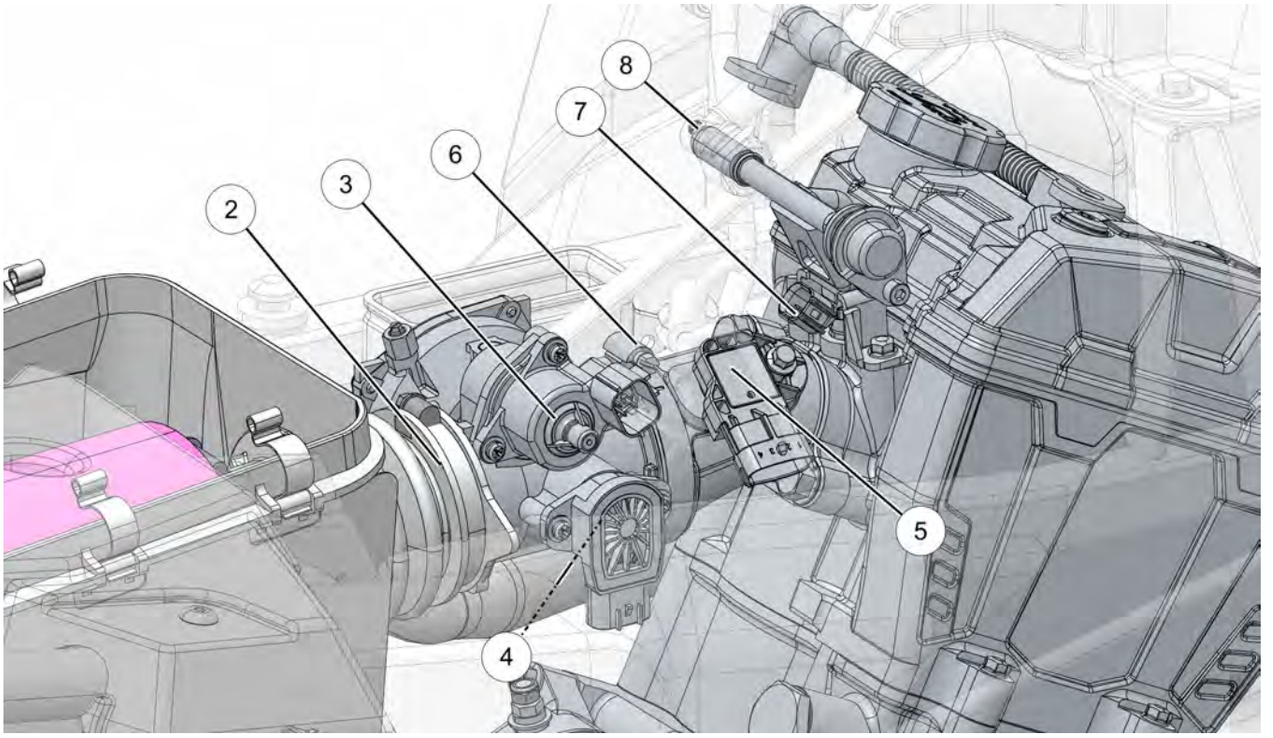
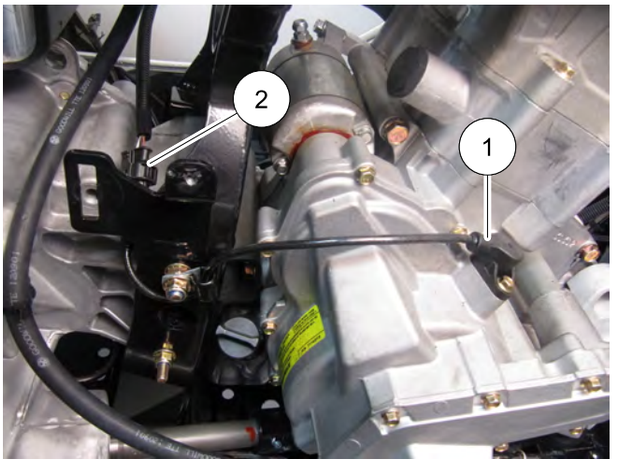


10. Loosen the hose clamp (2) securing the throttle body to the air box. Lift air box up and rearward as an assembly to disengage it from the throttle body and remove it from the vehicle.
11. Disconnect the IAC valve (3), TPS (4), T-MAP sensor (5), harness leads from the throttle body.
12. Loosen the hose clamp (6) securing the throttle body to the engine intake boot. Remove throttle body from the engine and wrap it with a clean shop towel. Place throttle body on the left-hand side frame rail area.

    NOTE: Be sure dirt and debris do not enter the engine, air box or throttle body. Use clean shop towels to plug engine and air box intake holes.

13. Disconnect the fuel injector harness lead (7) from the fuel injector.
14. Properly relieve fuel pressure from the fuel rail.
15. Place a shop to beneath the fuel line quick connector to catch any excess fuel. Disconnect the fuel line (8) from the fuel rail by pressing in on the quick connector tabs.
16. Move fuel line to the left-hand side of the engine compartment. Make note of line routing for installation.
17. Disconnect the ignition coil harness connector and remove the spark plug wire from the engine.
18. Disconnect the stator wire connector and cut the tie strap securing the wiring to the left front engine mount bracket. Replace tie strap for engine installation. (note routing for reassembly)
19. Disconnect the CPS sensor (1) from the vehicle wiring harness (2) and remove the strain relief (3). (note routing for reassembly)



20. Remove (+) positive cable from the starter motor.
    1. If desired, remove the remaining starter motor bolt and remove the starter motor from the engine.

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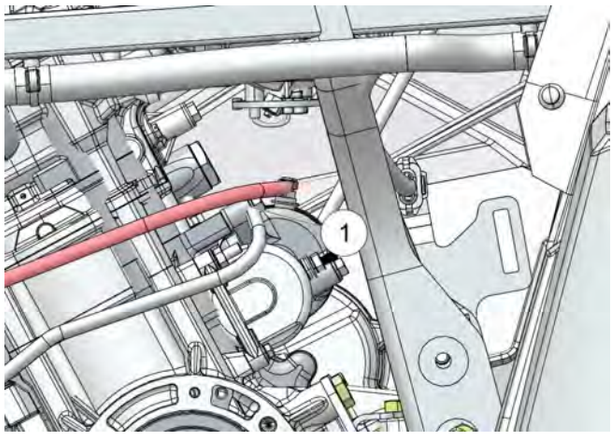
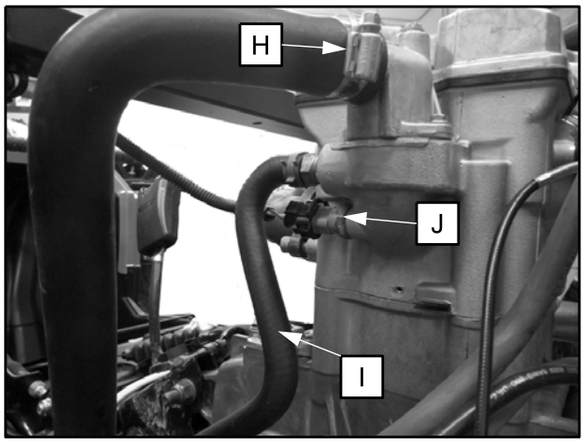
21. Remove (-) negative cable(1) by removing the starter mounting bolt.



22. Disconnect the upper engine coolant hose (H), bypass hose (I) and ECT (J) harness connector.



23. Remove the exhaust springs and fasteners retaining the exhaust manifold heat shields.
24. Remove the heat shields and exhaust pipe from the vehicle to gain engine removal clearance.

    NOTE: Dispose of exhaust seals at this time.

25. Remove front Prop shaft. (See PROP SHAFT - FRONT OR REAR, page 7.34)
26. Remove the fastener that connects the rear engine mount to the frame.
27. Remove the front engine mounts to aid in engine removal.
28. With the help of an assistant rotate the top of the engine forward until the top of the cylinder head is facing the front of the vehicle.
29. With the help of an assistant lift the engine and rotate it out the frame opening at the left side of the vehicle.

    NOTE: Rest the engine on the left footwell supports.

30. Use an overhead or portable engine hoist and suitable engine straps to secure the engine in its current position.

    NOTE: Have an assistant help guide the engine in and out of the vehicle while using an engine hoist to prevent personal injury or damage to the vehicle components.

31. Install the engine stand adapter (PU-50824-A) onto the engine PTO side mounting ears as shown below.

32. Select the proper engine stand sleeve adapter and install it onto the engine stand adapter.
    - Sleeve adapter for a 2” bore engine stand:
    - (PU-50625)
    - Sleeve adapter for a 2.375” bore engine stand:
    - (PW-47054)
33. Place engine onto the engine stand (PU-50824-A) for service.

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Engine Installation

Use the following procedure to reinstall the engine assembly.

1. Attach engine with suitable lifting straps to an overhead or portable engine hoist.
2. Remove the engine stand adapter plate.
3. Use the overhead or portable engine hoist and suitable engine straps to lower the engine onto the left footwell support.

   NOTE: Have an assistant help guide the engine in and out of the vehicle while using an engine hoist to prevent personal injury or damage to vehicle components.

4. Remove the lifting straps and overhead or portable engine hoist and remove the support previously installed under the transmission case during the engine removal process.
5. Have an assistant help lift and rotate the engine into the frame.
6. Install the rear engine mount fasteners .

   IMPORTANT: Do not tighten fasteners at this time.

7. Install the front engine mounts and fasteners.

   IMPORTANT: Do not tighten fasteners at this time.

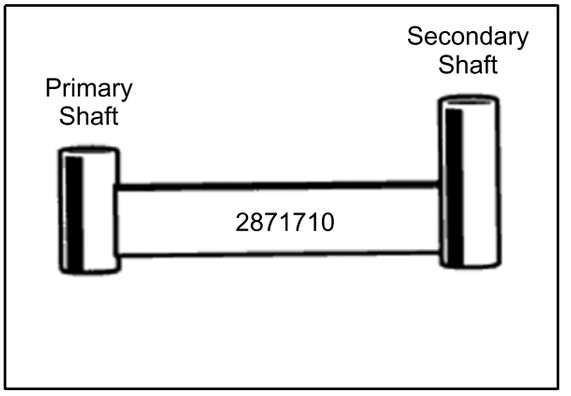
8. Torque the rear engine mount fasteners to specification.

= T
Flanged nut: 23 ft-lbs ± 10% (50 Nm ± 10%)

9. Install the Clutch Center Distance Tool (PN 2871710) onto the crankshaft and transmission input shaft to properly position the clutch center distance. (See CLUTCH ALIGNMENT, page 6.13)

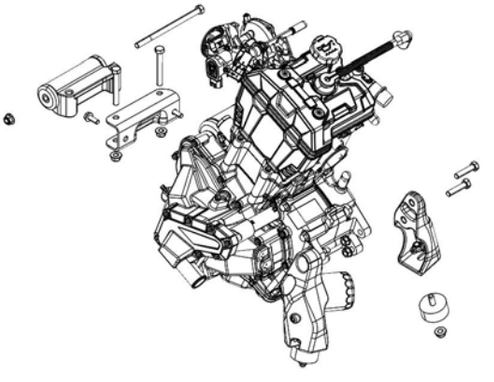
   NOTE: Verify clutch center to center alignment at this time.

   If necessary shim the rear engine to frame mount as required.



10. Torque the fasteners that attach the front engine mounts to the engine to specification.

= T
Front engine mount: 37 ft-lbs ± 10% (50 Nm ± 10%)



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11. Torque the fasteners that attach the front engine mounts isolators to specification.

= T
Front engine mount Isolators: 23 ft-lbs ± 10% (50 Nm ± 10%)

12. Remove the clutch center-to-center tool.

    NOTE: The clutch center to center alignment tool should not have pressure on it at this time.

    If pressure is observed, adjust as necessary.

13. Install front prop shaft.(See PROP SHAFT - FRONT OR REAR, page 7.34)
14. Reposition the head pipe assembly in the chassis and install new exhaust seals . Install the head pipe bolts and torque to specification.(if removed)

= T
Exhaust Head Pipe Bolts: **18 ft-lbs (24.5 Nm)**

15. Install the springs securing the muffler to the head pipe.
16. Install the coolant hoses onto the engine.
17. Install the throttle body and air box. Tighten the hose clamps(see 2 and 6 before step 21) that secure the throttle body to the intake duct, intake boot and air box.
18. Install the lower stater motor bolt through the lower starter motor mounting boss.
19. Instal the starter motor onto the engine.
20. Install the starter motor and battery cables as outlined in Chapter 10.

= T
Starter Motor Fastener: **7 ft-lbs (10 Nm)**

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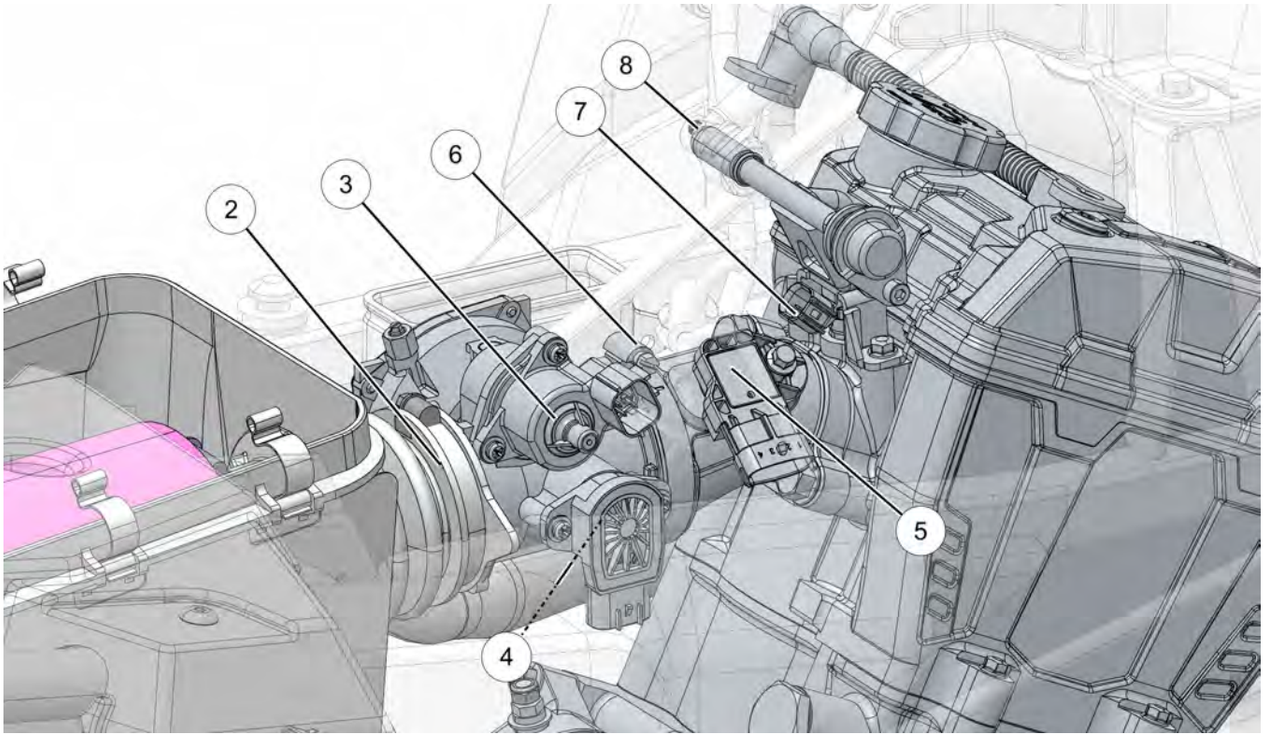

21. Connect the harness leads to the IAC valve (3), TPS (4), T-MAP sensor (5). Verify routing is correct.
22. Connect the fuel injector harness lead (7) to the fuel injector.
23. Connect the fuel line (8) to the fuel rail.
24. Connect the ignition coil harness connector and install the spark plug wire.
25. Install the CPS and mounting bolt into the stator cover and torque to specification. (if removed)

= T
CPS Fastener: **9 ft-lbs (12 Nm)**

26. Connect the stator wire connector and verify that it is secure to the front engine mount bracket.
27. Install the inner clutch cover as outlined in chapter 6.
28. Install the drive clutch, driven clutch, belt and outer clutch cover as outlined in Chapter 6. Be sure all hose and wire routings are correct. Torque all fasteners to specification as outlined in Chapter 6. (See CLUTCH ALIGNMENT, page 6.13)
29. Install the PVT inlet/exhaust ducts and the airbox top.
30. Remove the pressure cap and fill the cooling system through the filler neck with properly mixed anti-freeze / coolant.
31. If the engine oil was completely drained, add approximately 2 quarts (1.9 L) of Polaris PS-4 Synthetic Engine Oil into the crankcase.
32. Install a new oil filter. Lubricate the seal with engine oil prior to installation (see).
33. Connect the (-) negative battery cable to the battery.
34. Install the fuel tank, front cab (if required) , footwells, side panel, and seats. (See BODY, page 5.3)

    NOTE: Install the right passenger footwell on touring models at this time.

35. Follow the “Cooling System Bleeding Procedure” as outlined in this chapter. (See Cooling System Bleeding Procedure, page 3.20)
36. Start engine and check for any oil or coolant leaks.
37. Check the engine oil level (see Engine Oil Level, page 2.16).
38. Refer customer to “ Engine Break-In Period, page 3.37” upon returning vehicle to customer.

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Engine Break-In Period

The break-in period consists of the first 25 hours of operation, or the time it takes to use 15 gallons (57 liters) of fuel. Careful treatment of a new engine and drive components will result in more efficient performance and longer life for these components.

CAUTION

Use only Polaris PS-4
Synthetic Engine Oil.

Never substitute or mix oil brands.

Serious engine damage and voiding of warranty can result.

Do not operate at full throttle or high speeds for extended periods during the first three hours of use. Excessive heat can build up and cause damage to close fitted engine parts.

1. Fill fuel tank with unleaded fuel which has a minimum pump octane number of 87 = (R+ M)/2.
2. Refer to Chapter 2, “Engine Oil Level”. Check oil level indicated on oil tank dipstick. Add oil if necessary.
3. Drive slowly at first to gradually bring engine up to operating temperature.
4. Vary throttle positions. Do not operate at sustained idle or sustained high speed.
5. Perform regular checks on fluid levels, controls and all important bolt torques.
6. Change oil and oil filter after break-in period at 25 hours.

Engine Lubrication Specifications

Oil Capacity:
Approx. 2 Quarts (1.9 L)

Oil Filter Wrench:
PU-50105 or 2.5” (64 mm)

Oil Type:
Polaris PS-4
Synthetic Engine Oil

Oil Pressure
Minimum Specification:
(using Polaris PS-4 at operating temperature)
10 PSI @ 1200 RPM(Minimum)
40 PSI @ 7000 RPM (Minimum)

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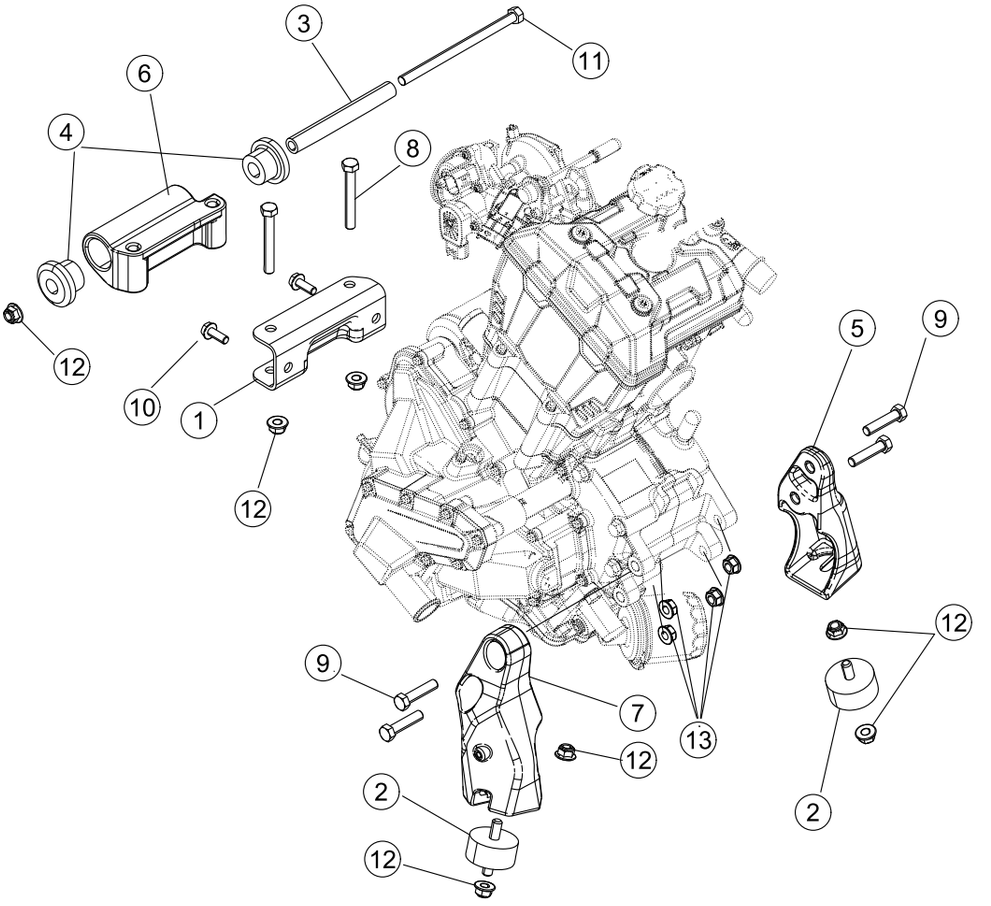
Engine Mounting and Torque Values



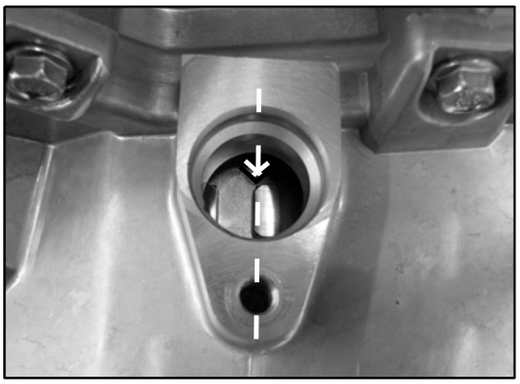
REF.	DESCRIPTION	NOTE
1	MOUNT, ENGINE, REAR	
2	ISOLATOR	Replace if excessively worn or damaged.
3	TUBE, ISOLATOR, REAR	
4	ISOLATOR, RUBBER	Replace if excessively worn or damaged.
5	MOUNT, ENGINE, FRONT, LH, CAST	
6	MOUNT, ENGINE, REAR, CAST	
7	MOUNT, ENGINE, FRONT, RH, CAST	
8	SCREW	
9	SCREW	
10	BOLT	37 ft-lbs ± 10% (31 Nm ± 10%)
11	SCREW	
12	NUT, FLANGE, LOCK	23 ft-lbs ± 10% (50 Nm ± 10%)
13	NUT, FLANGE, LOCK	37 ft-lbs ± 10% (50 Nm ± 10%)

Setting TDC (Top-Dead-Center)

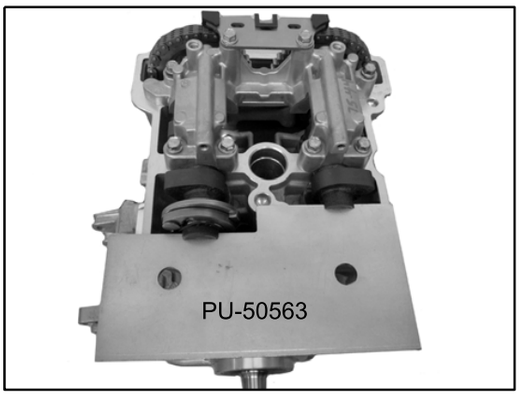
There are three ways to ensure the piston is at TDC. Remove the outer clutch cover to access the drive clutch to aid in engine rotation (manually turn the drive clutch counter clockwise).

1. With the CPS sensor removed, rotate the engine until the “V” marked on the flywheel is aligned with the CPS mounting hole. **This will set TDC, but not necessarily TDC of the compression stroke.**

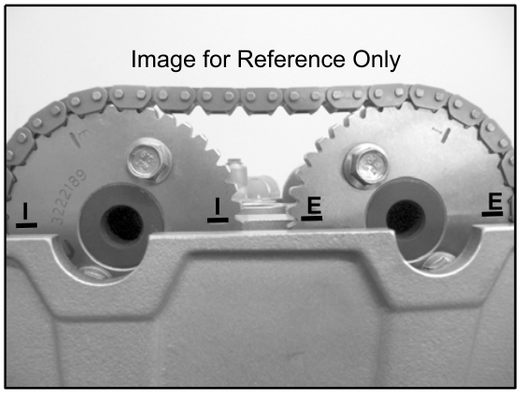
   NOTE: View the timing marks on the camshaft sprockets to ensure the engine is at TDC of the compression stroke.



2. With the valve cover and thermostat housing removed, rotate the engine so the cam lobes are facing outward and the Cylinder Holding and Camshaft Timing Plate (PU-50563) can be installed into the slots of the camshafts as shown below. This will set TDC of the compression stroke.

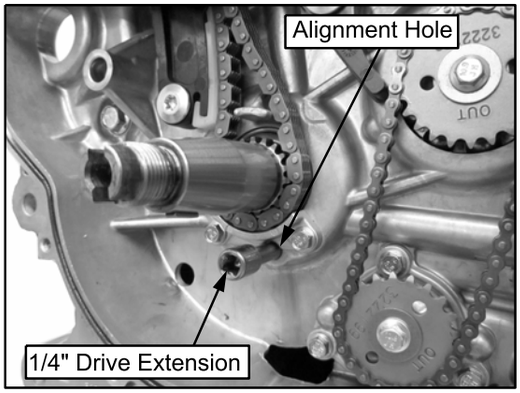


NOTE: Intake cam sprocket should have “I” marks aligned with gasket surface and the exhaust cam sprocket should have “E” marks aligned with gasket surface.



3. With the stator cover and flywheel removed, rotate the engine and position the piston at TDC by aligning the timing hole in crank case with a timing hole in the crankshaft.

4. Insert a 1/4” drive socket extension through the crankcase and into the crankshaft locating hole. **This will set TDC, but not necessarily TDC of the compression stroke.** View the timing marks on the cam shaft sprockets to ensure the engine is at TDC of the compression stroke.



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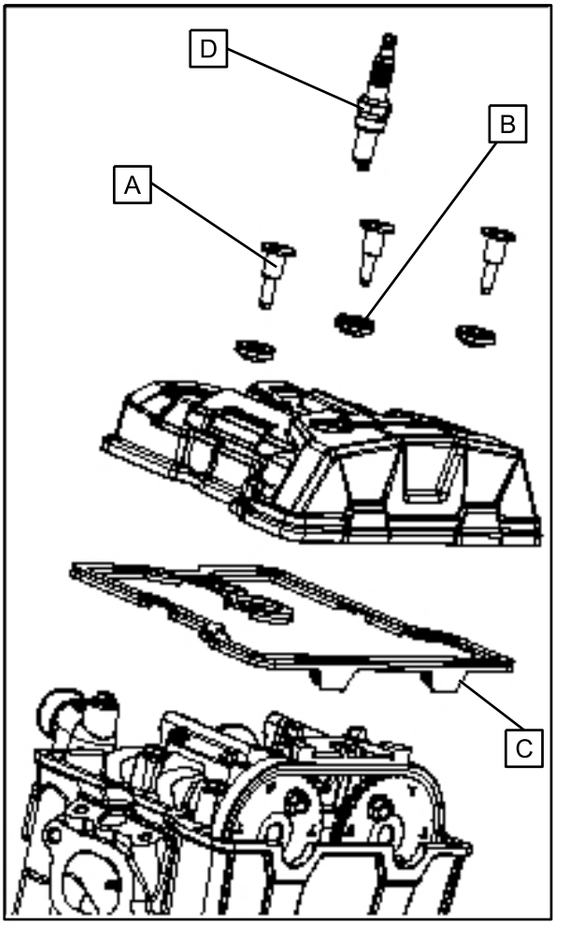
ENGINE DISASSEMBLY / INSPECTION - TOP END

Valve Cover Removal

NOTE: The valve cover, camshafts, cylinder head, cylinder and piston can be serviced with the engine installed in the chassis.

1. If needed, remove the spark plug wire from the engine.
2. Remove dirt and debris from valve cover area.
3. Remove the (3) valve cover shoulder bolts (A) and isolators (B) using a T40 driver.
4. Carefully lift valve cover from the engine and remove it out of the right-hand rear wheel well area.

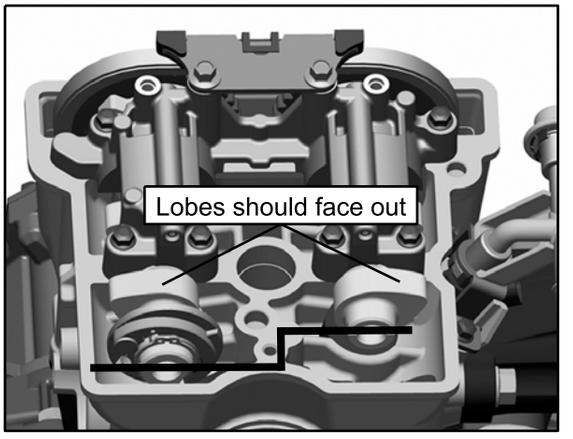


5. Replace isolators (B) and valve cover seal (C) if oil leaks are evident.
6. Remove the spark plug (D). Stuff spark plug hole with a shop towel to prevent anything from falling into the combustion chamber (if further engine disassembly is required).

Camshaft / Carrier Removal

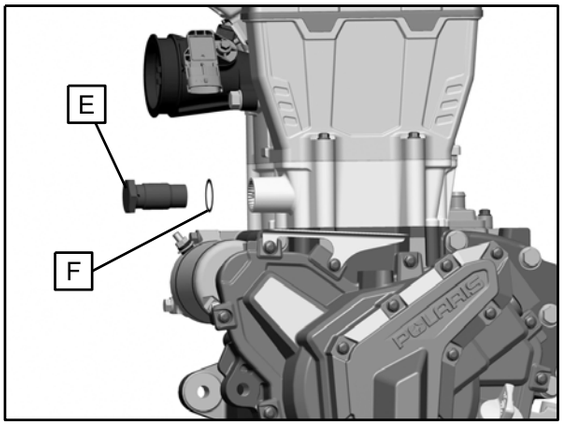
NOTE: The camshafts can be removed with the engine installed in the chassis.

1. Rotate the engine so the piston is at Top Dead Center (TDC) on the compression stroke.



NOTE: To verify TDC, see the "SETTING TDC" section in this chapter.

2. Remove the hydraulic cam chain tensioner (E) from the cylinder. Replace the sealing washer (F) upon reassembly.



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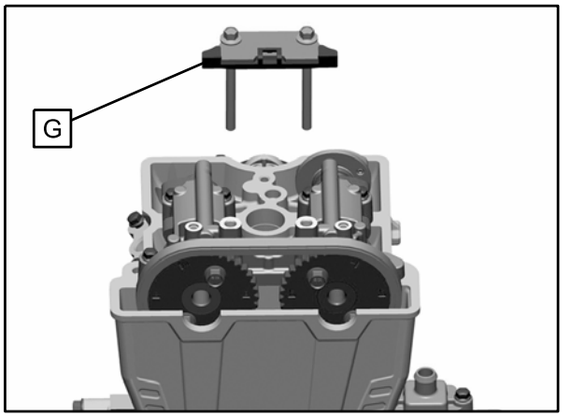
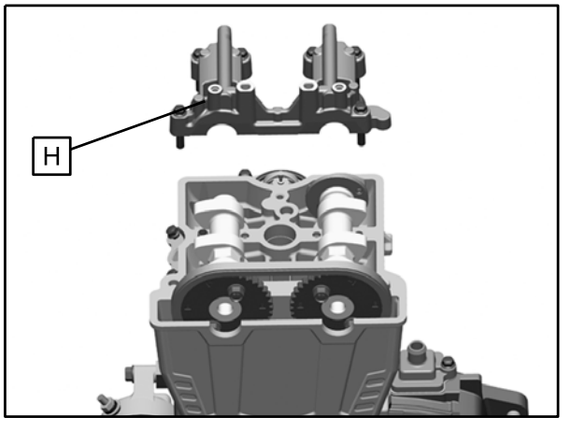
3. Remove the (2) bolts retaining the fixed cam chain guide (G) and remove the assembly from the engine. Inspect the guide for wear and replace if necessary.

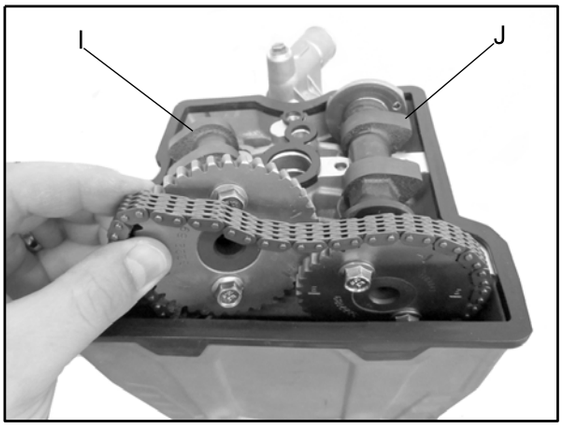


4. Remove the remaining (6) bolts that retain the camshaft carrier (H) and carefully lift the carrier off the camshafts.



NOTE: The crankcase has a lower guide to prevent the chain from falling off the crankshaft.

5. Attach a hook or other tool to the camshaft chain to prevent it from dropping down into the engine.
6. Mark the intake (I) and exhaust (J) camshafts to ensure proper assembly.
7. Lift upward on the intake camshaft while rotating it counter-clockwise. Walk the timing chain off of the sprocket. Carefully remove the intake camshaft from the engine.



8. Remove the cam chain from the exhaust camshaft sprocket (J) and remove the exhaust camshaft from the engine.

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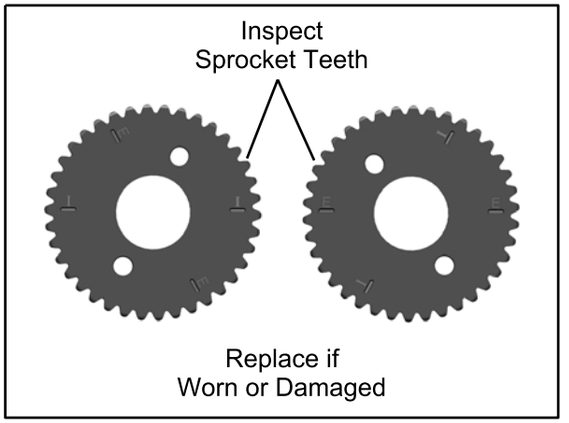
Camshaft Sprocket Inspection

NOTE: Camshaft sprocket removal is not necessary unless the replacement of the sprockets is required.

Inspect cam sprocket teeth for wear or damage. Replace timing chain and sprockets as a set if worn or damaged.



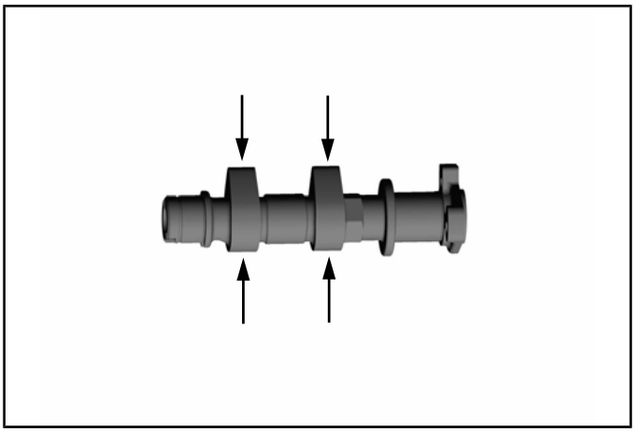
NOTE: Replace intake camshaft sprocket bolt if loosened or removed.

= T
Intake Camshaft Sprocket Bolt: **33 ft-lb (45 Nm)**

Camshaft Inspection

Inspect all main journals and cam lobes as described below and compare to specifications. Replace camshafts or cylinder head if worn beyond service limit or if any surface is pitted or damaged.

1. Visually inspect each cam lobe for wear or damage.
2. Measure the height of each cam lobe from the base circle to highest point on the lobe using a micrometer. Compare to specification.



NOTE: Replace camshafts if damaged or if any part is worn past the service limit.

= In. / mm.
Camshaft Lobe Height: Intake: 1.5704" ± 0.0038" (39.89 ± 0.097 mm) Exhaust: 1.5405" ± 0.0038" (39.13 ± 0.097 mm)

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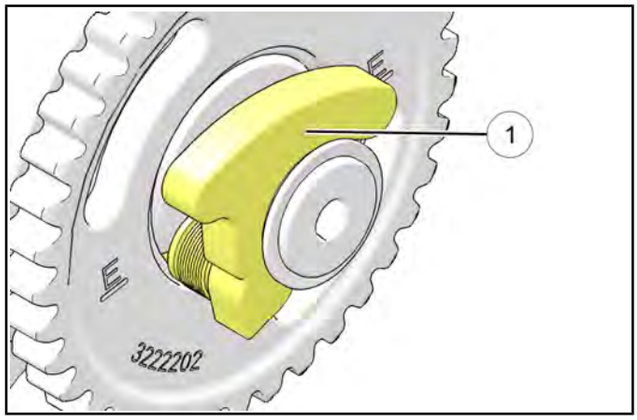
Exhaust Camshaft Decompression Mechanism

NOTE: Removal of the decompression mechanism is not necessary unless replacement is required.

1. Thoroughly clean and inspect the decompression mechanism (1) located on the exhaust camshaft.
2. Replace the decompression assembly if any excessive wear or binding is evident.



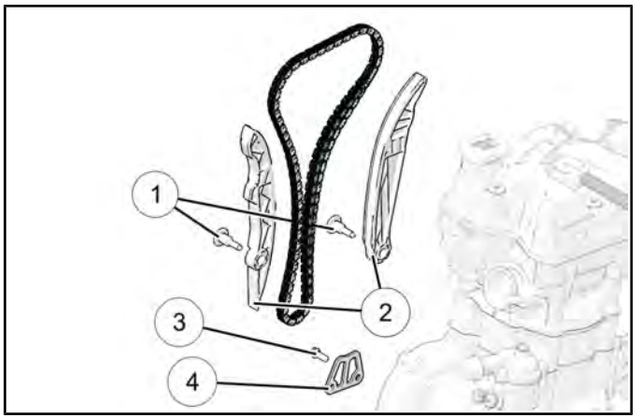
3. Be sure the decompression mechanism functions smoothly and easily returns under spring pressure to the resting position against gravity.

Cam Chain and Guide Service

NOTE: The crankcase has a removable lower cam chain drive guide that prevents the chain from disengaging the crankshaft during engine service.

The cam chain, cam chain guides and cam chain tensioner can be replaced with the engine installed in the vehicle.

1. If not already performed, remove the valve cover, stator cover, flywheel, cam chain tensioner, cam carrier and camshafts as outlined in this chapter.
2. Remove the two fasteners (1) that secure the cam chain guides (2) to the crankcase.
3. Remove the fastener (3) that secure the lower cam chain guide (4) to the crankcase.
4. Inspect the cam chain guides and replace if excessive wear is evident.
5. Upon installation, torque all fasteners to specification and reassemble engine and vehicle as outlined in this chapter.



= T
Cam Chain Guide Fasteners: **9 ft-lb (12 Nm)**

Cylinder Head Removal

NOTE: The cylinder head can be serviced with the engine installed in the chassis.

Do not rotate head assembly up side-down until the valve tappets have been removed.

1. Remove and discard the (2) outer M6 bolts (A) that retain the cylinder head (B) and the cylinder.
2. Loosen the (4) cylinder head bolts (C) evenly 1/8 turn (60 degrees) at a time until all are loose.
3. Remove and discard the cylinder head bolts (C). Replace with *new* upon assembly.
4. Tap cylinder head lightly with a soft faced hammer until loose. Tap only in reinforced areas or on thick parts of the cylinder head casting.

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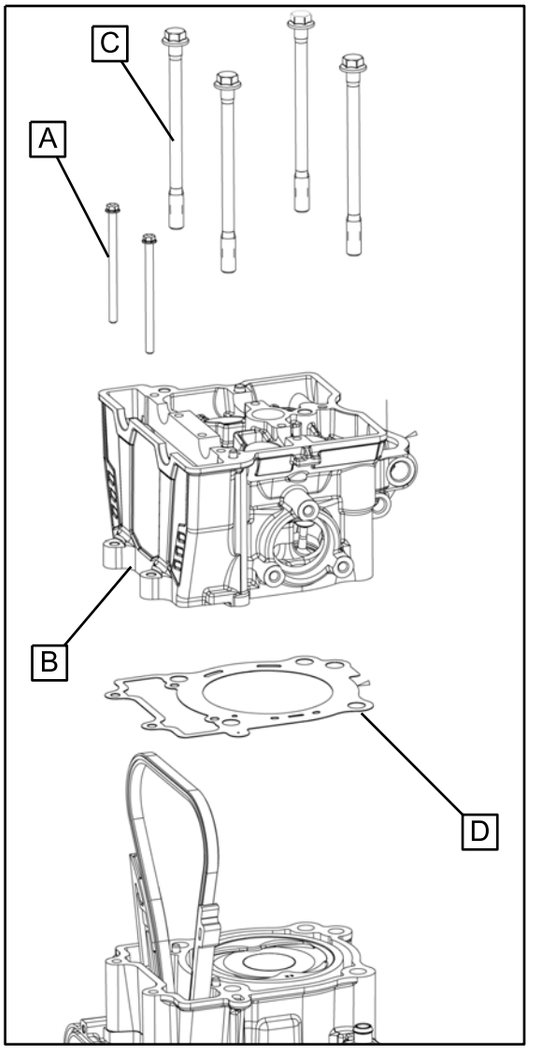
5. Remove the cylinder head (B) and head gasket (D).



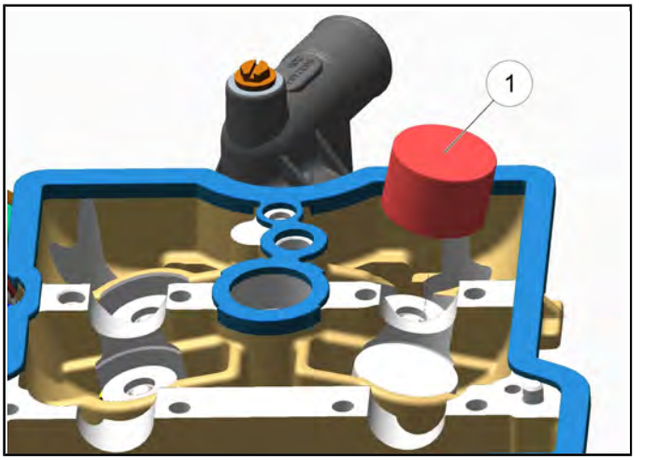
Cylinder Head Disassembly

WARNING

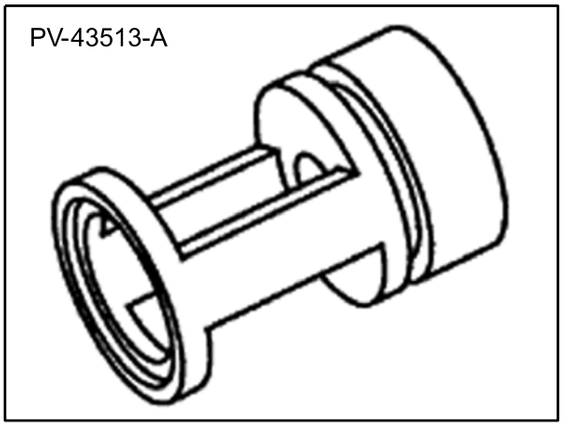
Wear eye protection during cylinder head disassembly and reassembly or when working with the valve springs.

NOTE: Keep mated parts together and in order with respect to their location in the cylinder head for assembly purposes. It is important to install cylinder head components back in the same location. Mark each component or place them in an organized rack as you remove them.

1. Remove the valve tappet (Item 1) from the cylinder head.



2. Compress the valve spring by hand using valve spring compressor adapter (PV-43513-A).



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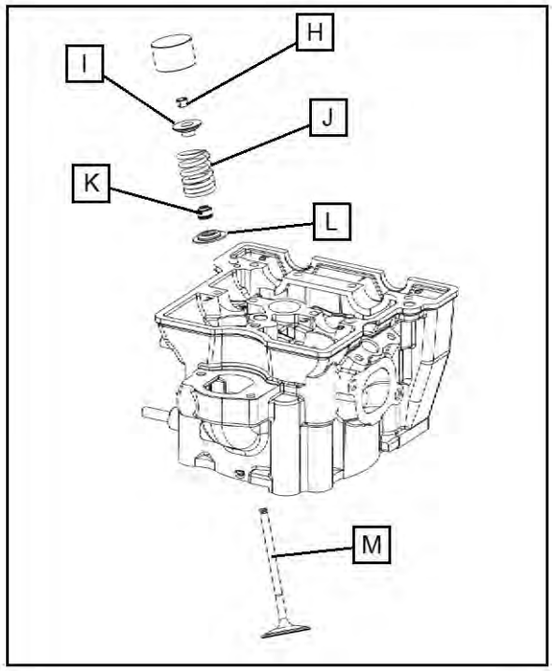
3. Push down on the spring and remove the split keepers (H).



4. Slowly release valve spring pressure and remove the compressor adapter.
5. Remove the valve retainer (I), valve spring (J), valve stem seal (K) and valve spring seat (L). Discard the valve seal.

   NOTE: Replace valve seals whenever cylinder head is disassembled. Hardened, cracked or worn seals will cause excessive oil consumption.

6. Lift up the cylinder head and push the valve (M) out, keeping it in order for reassembly in the same valve guide.
7. Repeat the previous steps to remove the remaining valves.
8. Clean the combustion chamber and head gasket surface.

Cylinder Head Inspection

Thoroughly clean cylinder head surface to remove all traces of gasket material and carbon.

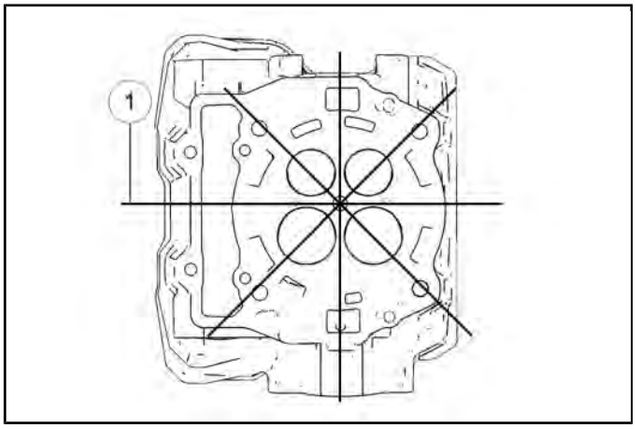
⚠ CAUTION

Use care not to damage gasket sealing surface. All gasket surfaces must be clean, dry and free of any oil or grease upon assembly. Clean sealing surfaces with rubbing alcohol or electrical contact cleaner. Do not touch sealing surfaces of the new head gasket.

3

Cylinder Head Warp Inspection

1. Lay a straight edge (1) across the surface of the cylinder head at several different points and measure warp by inserting a feeler gauge between the straight edge and the cylinder head surface. If warp exceeds the service limit, replace the cylinder head.



= In. / mm.

Cylinder Head Warp Limit:
.0024" (0.06 mm)

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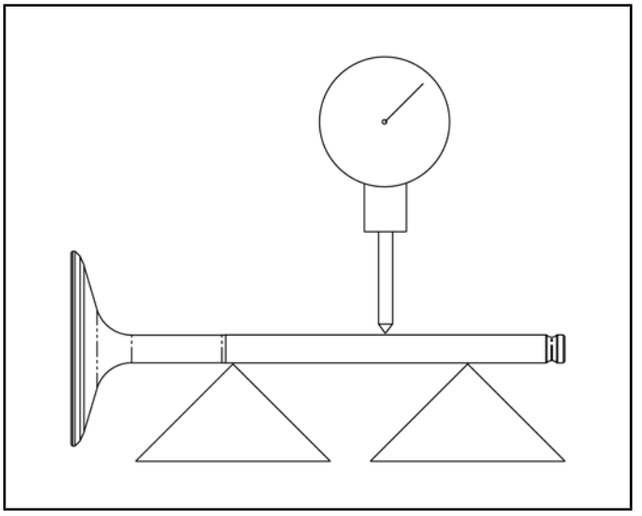
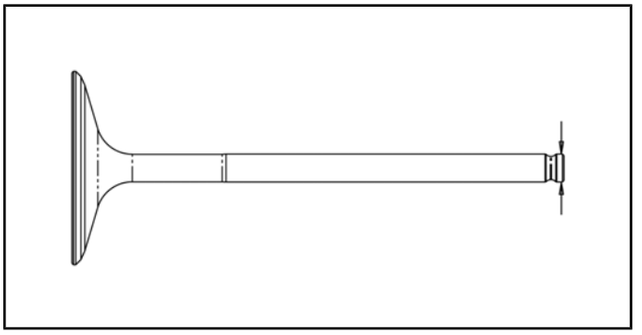
Valve Inspection

1. Remove all carbon from valves with a soft wire wheel or brush.
2. Check valve face for excessive runout, pitting, and burnt spots.
3. To check for bent valve stems, mount valve in “V” blocks and measure with a dial indicator.



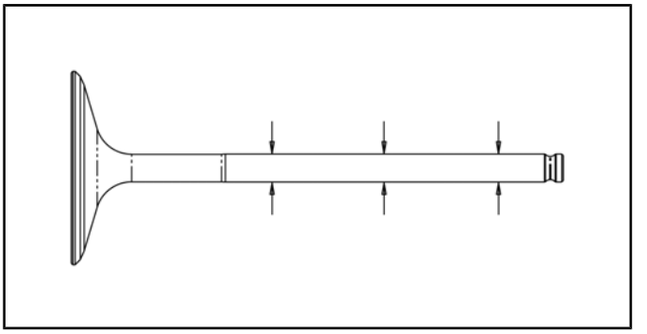
4. Check the end of the valve stem for flaring, pitting, wear or damage.



5. Inspect split keeper groove for wear or flaring in the keeper seat area.

   NOTE: The valves can be re-faced or end ground, if necessary. They must be replaced if extensively worn, burnt, bent or damaged.

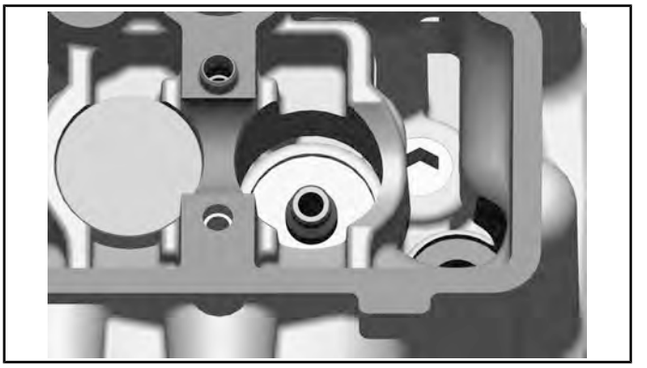
6. Measure diameter of valve stem with a micrometer in three places, then rotate 90° and measure again (take six measurements total). Compare to specifications.



 **= In. / mm.**

Valve Stem Diameter:
Intake: 0.2155" - 0.2161" (5.475 - 5.490 mm)
Exhaust: 0.2147" - 0.2153" (5.455 - 5.470 mm)

7. Measure valve guide inside diameter at the top middle and end of the guide using a small hole gauge and a micrometer. Measure in two directions.



 **= In. / mm.**

Valve Guide I.D.:
0.2165" - 0.2171" (5.500 - 5.515 mm)

8. Be sure to measure each guide and valve combination individually.

   NOTE: The valve guides cannot be replaced.

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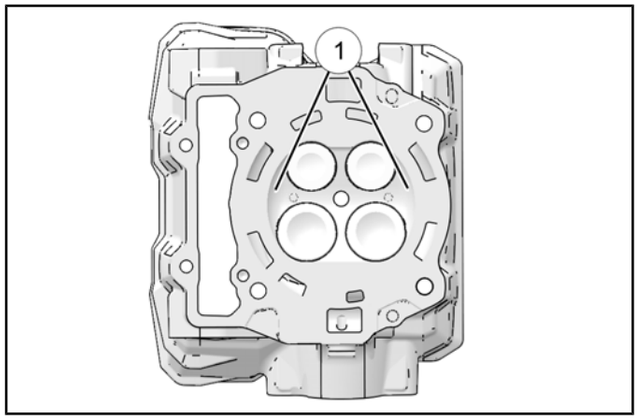
Combustion Chamber Cleaning

WARNING

Wear eye protection during combustion chamber cleaning.

1. Clean all accumulated carbon deposits from combustion chambers and valve seat area (1).



NOTE: Carbon Clean Fuel Treatment (2871326) can be used to help remove carbon deposits.

Do not use a metal scraper, a coarse wire brush or abrasive cleaners to clean the cylinder head. Damage may result.

2. Visually inspect cylinder head gasket surface and combustion chamber for cracks or damage. Pay close attention to the areas around spark plug and valve seats.

Valve Seat Reconditioning

Valve seat reconditioning should be performed by a technician proficient in cylinder head reconditioning techniques. Reconditioning techniques vary, so follow the instructions provided by the valve reconditioning equipment manufacturer. Do not grind seats more than necessary to provide proper seat surface, width, and contact point on valve face.

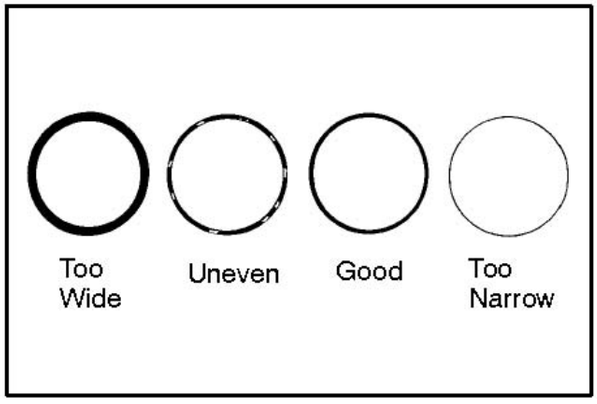
WARNING

Wear eye protection or a face shield during cylinder head disassembly and reassembly.

Valve Seat Inspection

Inspect valve seat in cylinder head for pitting, burnt spots, roughness, and uneven surface. If any of the above conditions exist, the valve seat must be reconditioned. *If the valve seat is cracked the cylinder head must be replaced.*

Valve seat width and point of contact on the valve face is very important for proper sealing. The valve must contact the valve seat over the entire circumference of the seat, and the seat must be the proper width all the way around. If the seat is uneven, compression leakage will result. If the seat is too wide, seat pressure is reduced, causing carbon accumulation and possible compression loss. If the seat is too narrow, heat transfer from valve to seat is reduced. The valve may overheat and warp, resulting in burnt valves.



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Renewing Valve Seats

1. Install pilot into valve guide.
2. Apply cutting oil to valve seat and cutter.
3. Place 46° cutter on the pilot and make a light cut.
4. Inspect the cut area of the seat:

   * If the contact area is less than 75% of the circumference of the seat, rotate the pilot 180° and make another light cut.

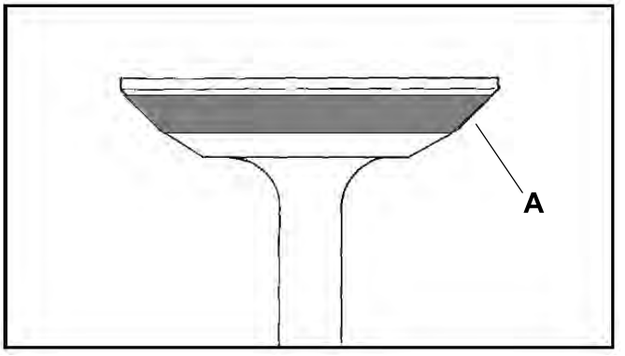
   * If the cutter now contacts the uncut portion of the seat, check the pilot. Look for burrs, nicks, or runout. If the pilot is bent it must be replaced.

   * If the contact area of the cutter is in the same place, the valve guide is distorted from improper installation.

   * If the contact area of the initial cut is greater than 75%, continue to cut the seat until all pits are removed and a new seat surface is evident.

   NOTE: Remove only the amount of material necessary to repair the seat surface.

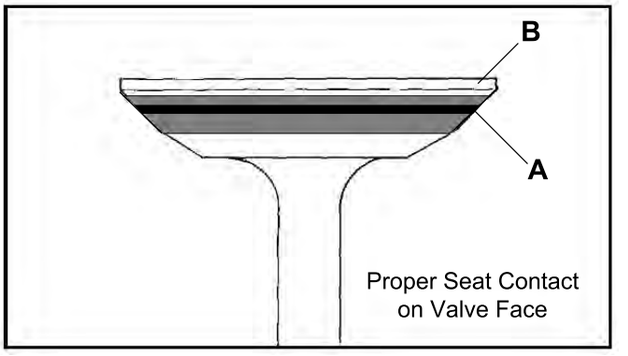
5. To check the contact area of the seat on the valve face, apply a thin coating of Prussian Blue paste to the valve seat. If using an interference angle (46°) apply black permanent marker to the entire valve face (A).

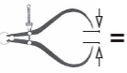


6. Insert valve into guide and tap valve lightly into place a few times.

7. Remove valve and check where the Prussian Blue indicates seat contact on the valve face. The valve seat should contact the middle of the valve face or slightly above, and must be the proper width.

   NOTE: When using an interference angle, the seat contact point on the valve will be very narrow, and is a normal condition. Look for an even and continuous contact point all the way around the valve face (A).



 **= In. / mm.**

Valve Seat Width:

Intake:
Std.: .0393" (1.00 mm)
Service Limit: .0551" (1.4 mm)

Exhaust:
Std.: .0590” (1.50 mm)
Service Limit: .0758" (1.9 mm)

* If the indicated seat contact is at the top edge of the valve face and contacts the margin area (B) it is too high on the valve face. Use the 30° cutter to lower the valve seat.
* If too low, use the 60° cutter to raise the seat. When contact area is centered on the valve face, measure seat width.
* If the seat is too wide or uneven, use both top and bottom cutters to narrow the seat.
* If the seat is too narrow, widen using the 45° cutter and re-check contact point on the valve face and seat width after each cut.

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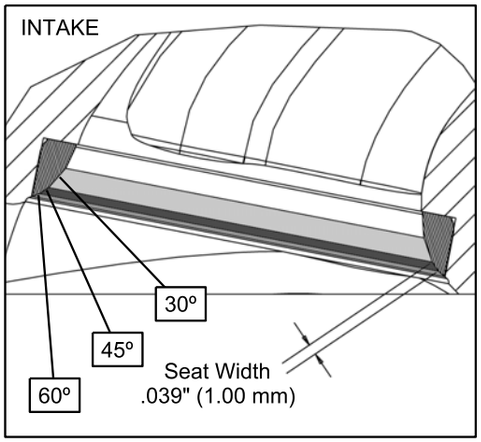
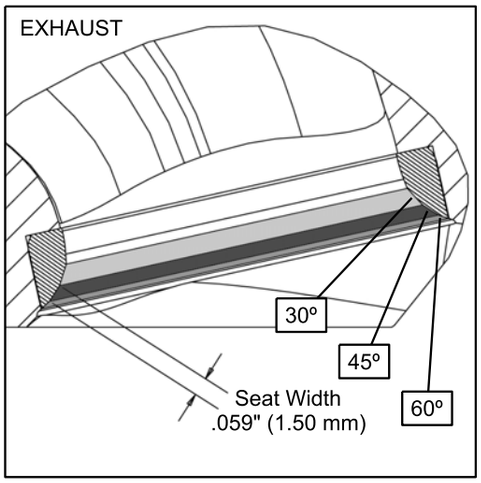
Intake Seat Cutter Diameter:
1.567 in. (39.80 mm)



Exhaust Seat Cutter Diameter:
1.364 in. (34.65 mm)



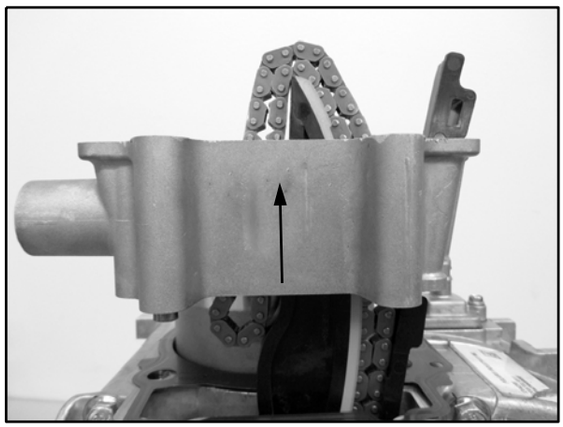
8. Clean all filings from the area with hot soapy water. Rinse and dry with compressed air.
9. Lubricate valve guides with clean engine oil and apply oil or water based lapping compound to the face of the valve.

   NOTE: Lapping is not required if an interference angle reconditioning method is used.

10. Insert the valve into its respective guide and lap using a lapping tool or a section of fuel line connected to the valve stem.
11. Rotate the valve rapidly back and forth until the cut sounds smooth. Lift the valve slightly off of the seat, rotate 1/4 turn, and repeat the lapping process. Do this four to five times until the valve is fully seated, and repeat process for the other valves.
12. Thoroughly clean cylinder head and valves.

Cylinder Removal

1. Remove and discard the head gasket (1).
2. Position the cam chain and guides vertically.
3. Tap cylinder (2) lightly with a plastic hammer in the reinforced areas only until loose.
4. Rock cylinder forward and backward and lift it from the crankcase, supporting piston (4) and connecting rod.
5. Remove the cylinder from the engine.



6. Remove and discard cylinder base gasket (3).

Cylinder Inspection

1. Remove all gasket material from the cylinder sealing surfaces.

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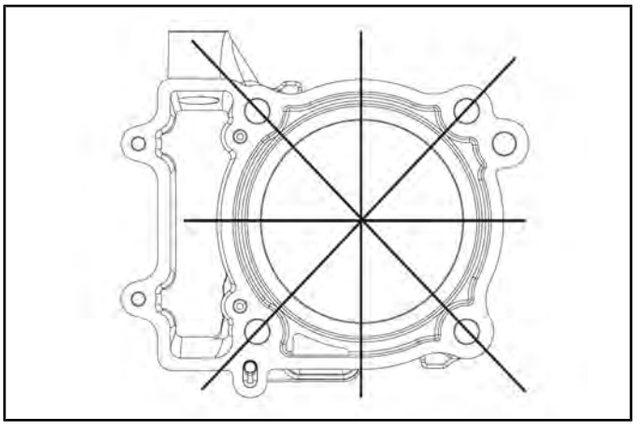
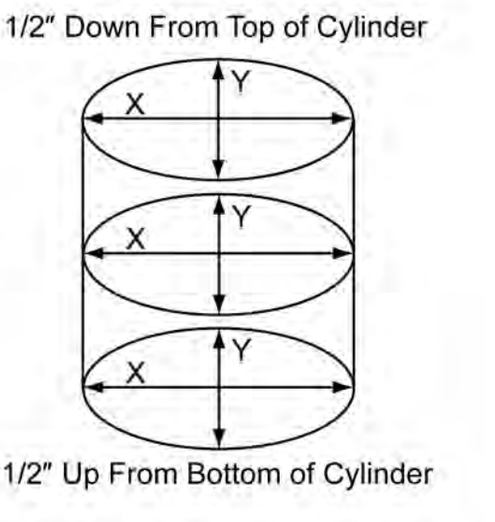
2. Inspect the top of the cylinder for warpage using a straight edge and feeler gauge.



Cylinder Warpage:
.00098” (.025 mm)

3. Inspect cylinder for wear, scratches, or damage.
4. Inspect cylinder for taper and out of round with a telescoping gauge or a dial bore gauge. Measure in two different directions, front to back and side to side, on three different levels (1/2" down from top, in the middle, and 1/2” up from bottom).



5. Record measurements taken in Step 4. If cylinder is tapered, or out of round beyond .001, cylinder must be re-bored oversize, or replaced.

Cylinder Taper
Limit: .001″ Max. (0.025 mm)

Cylinder Out of Round
Limit: .001″ Max. (.025 mm)

Standard Bore Size:

3.8976 +/- 0.0003″ (99.0 +/- 0.008 mm)

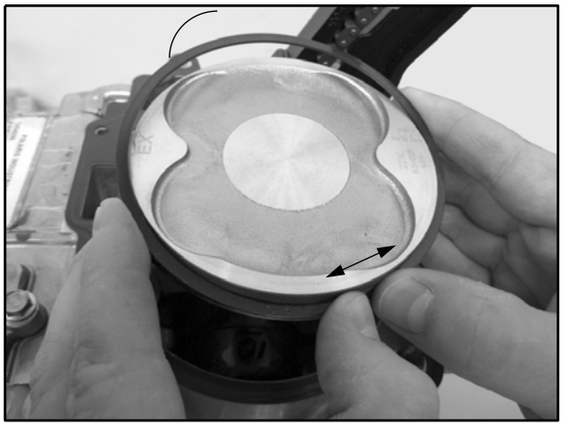
Piston Removal

1. Note piston directional indicator “EX” positioned toward the exhaust side of engine.
2. Remove piston circlip and push piston pin out of piston. If necessary, heat the crown of the piston *slightly* with a heat gun.
3. **CAUTION:** Do not apply heat to the piston rings, they may lose radial tension.
4. Remove top ring.

   ***Using a piston ring pliers**: Carefully expand ring and lift it off the piston.

   CAUTION: Do not expand the ring more than the amount necessary to remove it from the piston.

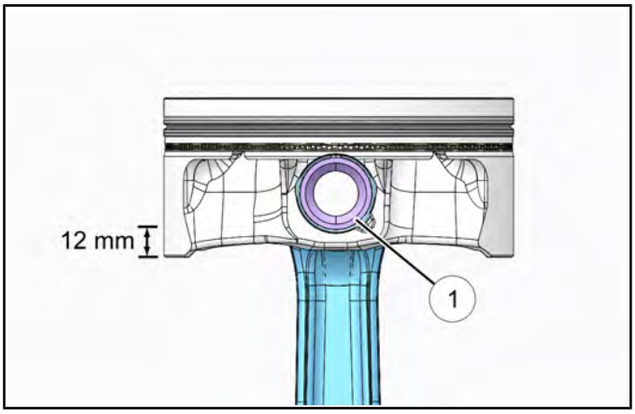
   ***By hand:** Placing both thumbs as shown, spread the ring open and push up on the opposite side.



5. Repeat procedure for second ring.
6. Remove oil control ring top rail first, then bottom rail.
7. Remove oil control ring expander.

Piston-to-Cylinder Clearance

1. Measure the outside diameter of the piston 12 mm from the skirt and at a right angle to the direction of the piston pin (Item 1).



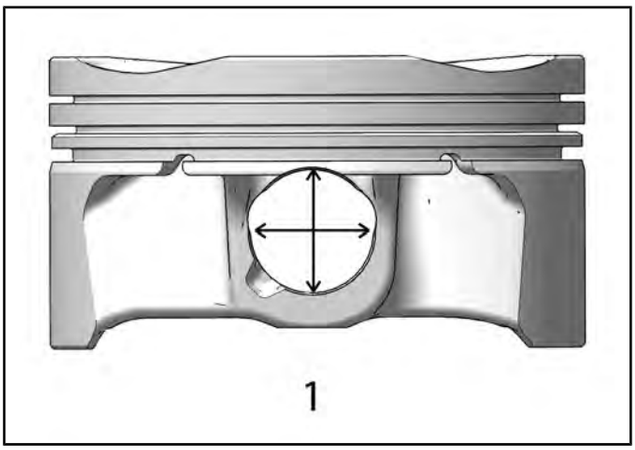
2. Subtract this measurement from the maximum cylinder size measurement from cylinder inspection.

Piston to Cylinder Clearance:
.00019 - .00216″ (.005 - .055 mm)

Piston O.D.:
3.8957 - 3.8968″ (98.953 - 98.980 mm)

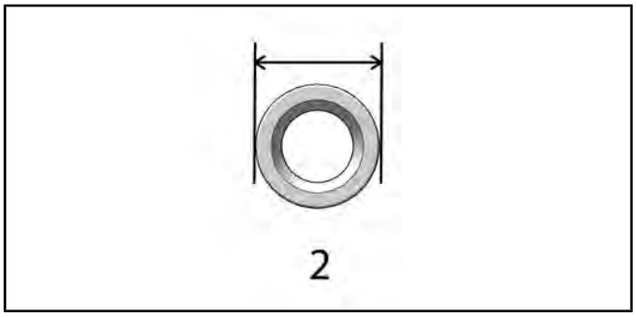
Piston / Rod Inspection

1. Measure piston pin bore inside diameter I.D.(Item 1).



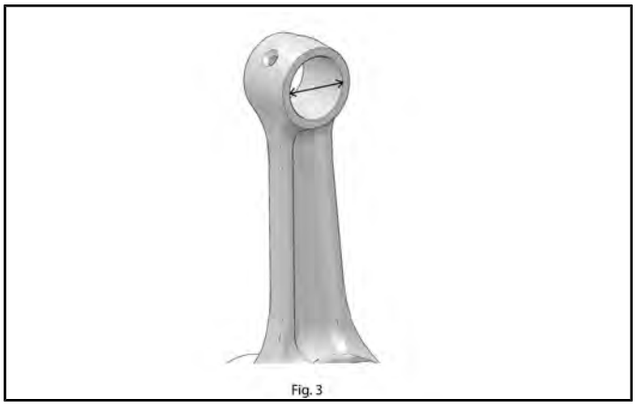
Piston Pin Bore:
Std.: 0.8662 - 0.8665″ (22.004 - 22.010 mm)
Service Limit: 0.8651″ (21.975 mm)

2. Measure piston pin O. D (2). Replace piston and/or piston pin if out of tolerance.



Piston Pin O.D.:
Std.: 0.8659 - 0.8661″ (21.995 - 22.0 mm)
Service Limit: 0.8651″ (21.975 mm)

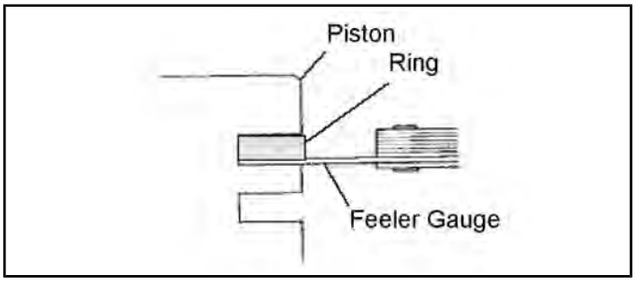
3. Measure connecting rod small end ID. Inspect bearing surface for damage.



Piston Pin Degree of Fit:
Pin should be a push-fit by hand with piston at room temperature or warmed slightly

Connecting Rod Small End ID:
Std.: 0.8665 - 0.8670″ (22.010 - 22.023 mm)

4. Measure piston ring to groove clearance by placing the ring in the ring land and measuring with a thickness gauge. Replace piston and rings if ring-to-groove clearance exceeds service limits.



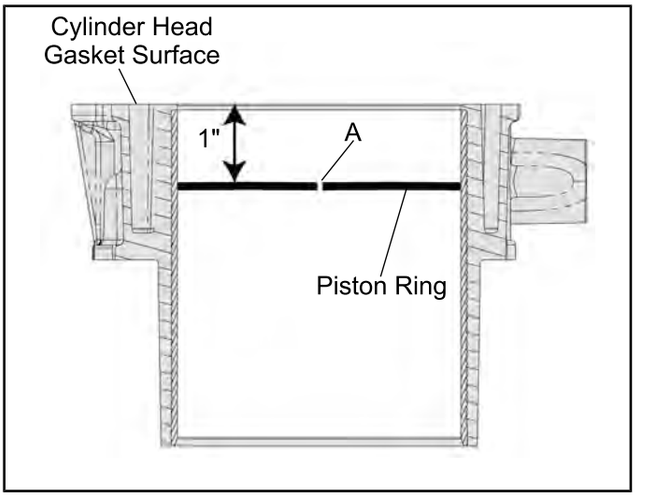
Piston Ring-to-Groove Clearance

Top Ring:
Std.: 0.0011 - 0.0037" (0.030 - 0.095 mm)
Service Limit: 0.0042" (0.108 mm)

Second Ring:
Std.: 0.0007 - 0.0029" (.020 - 0.076 mm)
Service Limit: 0.0035" (0.89 mm)

Piston Ring Installed Gap

1. Place each piston ring inside cylinder. Use a piston to push the ring squarely into place 1” (25.4 mm) down from the cylinder head gasket surface.
2. Measure installed gap with a feeler gauge at location (A).



Piston Ring Installed Gap

Top Ring:
Std: 0.0059 - 0.0122" (0.15 - 0.31 mm)
Limit: 0.0137" (0.35 mm)

Second Ring:
Std: 0.0094 - 0.0196" (0.24 - 0.50 mm)
Limit: 0.022" (0.56 mm)

Oil Ring Rails:
Std: 0.0098” - 0.0401" (0.25 - 1.02 mm)
Limit: 0.0480" (1.22 mm)

NOTE: Always check piston ring installed gap after re-boring a cylinder or when installing new rings.

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Honing to Oversize

CAUTION

If cylinder wear or damage is excessive, it will be necessary to oversize the cylinder using a new oversized piston and rings. This may be accomplished by either boring the cylinder and then finish honing to the final bore size, or by rough honing followed by finish honing.

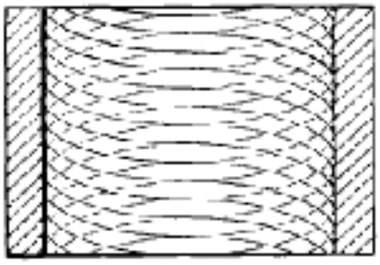
CAUTION

For oversize honing always wet hone using honing oil and a coarse roughing stone. Measure piston (see piston measurement) and calculate finished bore size. Always leave .002 - .003" (.05 - .07 mm) for finish bore sizing with a fine stone.

A finished cylinder should have a 45 degree cross-hatch pattern to ensure piston ring seating, aid in oil retention and reduce ring vibration during initial break-in. Hone cylinder according to hone manufacturer's instructions, or these guidelines:

- Use a motor speed of approximately 300-500 RPM, run the hone in and out of the cylinder rapidly until cutting tension decreases. Remember to keep the hone drive shaft centered (or cylinder centered on arbor) and to bring the stone approximately 1/2" (1.3 cm) beyond the bore at the end of each stroke.
- Release the hone at regular intervals and inspect the bore to determine if it has been cleared, and to check piston fit. **NOTE:** Do not allow cylinder to heat up during honing.

Example: Cross Hatch pattern



Cylinder Hone Selection / Honing Procedure

CAUTION

Selecting a hone which will straighten as well as remove material from the cylinder is very important. Using a common spring loaded finger type glaze breaker for honing is never advised. Polaris recommends using a rigid hone or arbor honing machine which also has the capability of oversizing.

Cylinders may be wet or dry honed depending upon the hone manufacturer's recommendations. Wet honing removes more material faster and leaves a more distinct pattern in the bore.

Cleaning the Cylinder After Honing

It is very important that the cylinder be thoroughly cleaned after honing to remove all grit material. Wash the cylinder in a solvent, then in hot, soapy water. Pay close attention to areas where the cylinder sleeve meets the aluminum casting. Use electrical contact cleaner if necessary to clean these areas. Rinse thoroughly, dry with compressed air, and oil the bore immediately with engine oil.

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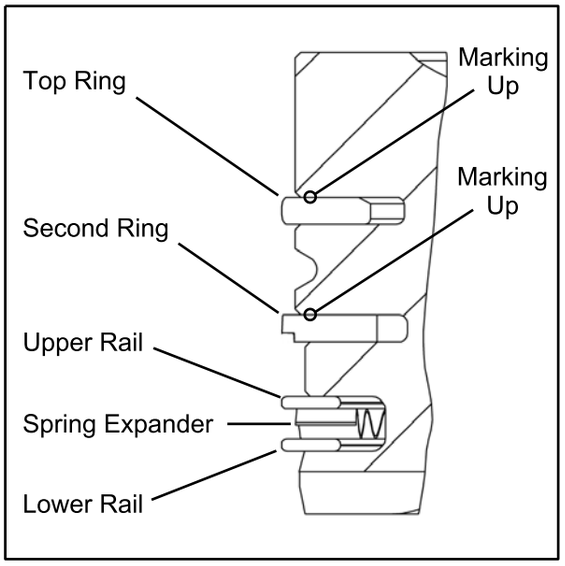
ENGINE ASSEMBLY - TOP END

Piston Ring Installation

NOTE: Apply clean engine oil to all ring surfaces and ring lands upon installation. Always check piston ring installed gap before rings are installed on piston (see "Piston Ring Installed Gap"). Clean accumulated carbon from piston ring grooves and oil ring lube holes if piston has been in service.



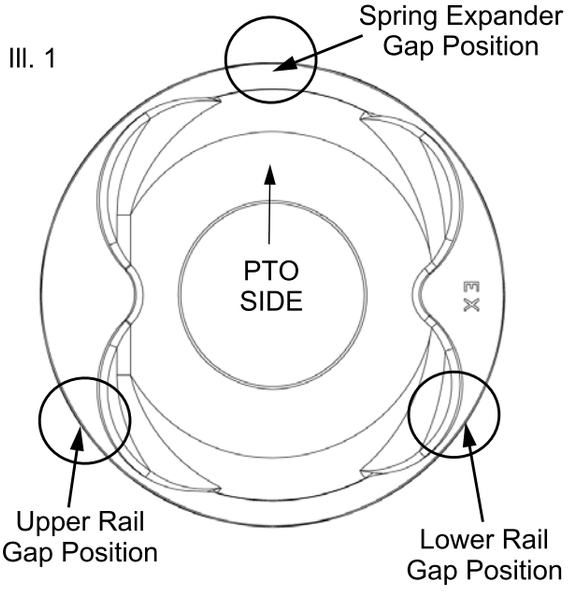
1. Place oil control ring expander in oil ring groove. Rotate expander in groove until butt ends are on PTO side of piston (see illustration 1).

   NOTE: Ends must butt squarely together and must not overlap.

2. Install lower rail with end gap positioned as shown in illustration 1.

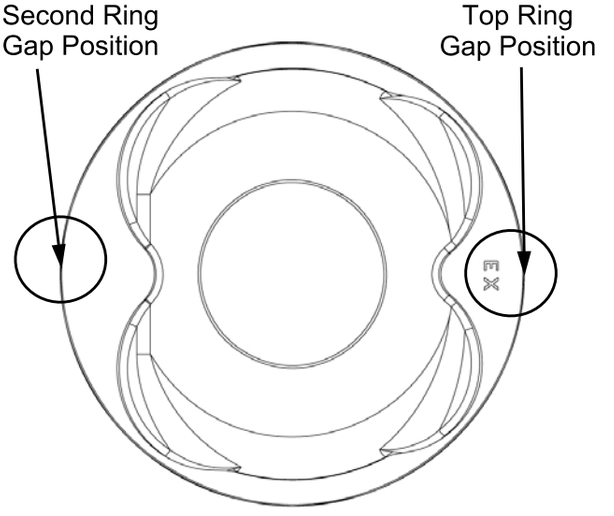
3. Install upper rail with end gap positioned as shown.

Ill. 1



4. Install second ring with marking facing top of piston. Rotate ring to position the end gap toward intake side of piston as shown below.

5. Install top ring with mark facing top of piston. Rotate ring to position the end gap toward exhaust side of piston as shown below.



6. Be sure top and second rings rotate freely in their grooves and do not bind when compressed by hand.

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Piston / Connecting Rod Assembly

1. Lubricate connecting rod small end, piston pin bore and piston pin with engine oil.

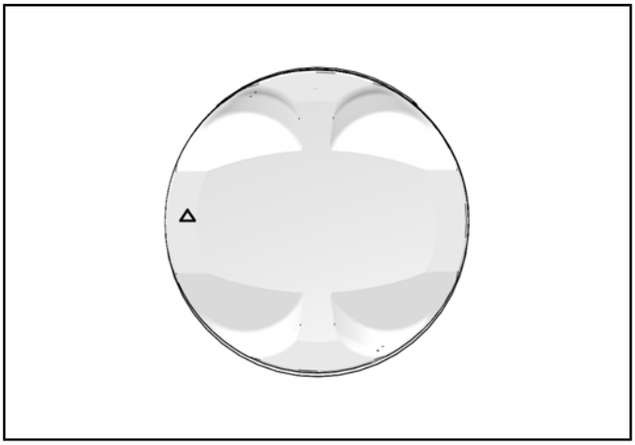
CAUTION

Do not re-use circlips. Circlips become deformed during the removal process.
Do not compress the new clip more than necessary to prevent loss of radial tension. Severe engine damage may result if circlips are re-used or deformed during installation.

2. Install a new circlip on one side of piston with gap at the top (12:00 position) or bottom (6:00 position).

   NOTE: Never re-use a piston pin circlip.

3. When installing the piston, be sure the piston marking “EX” is positioned towards the exhaust side of the engine.

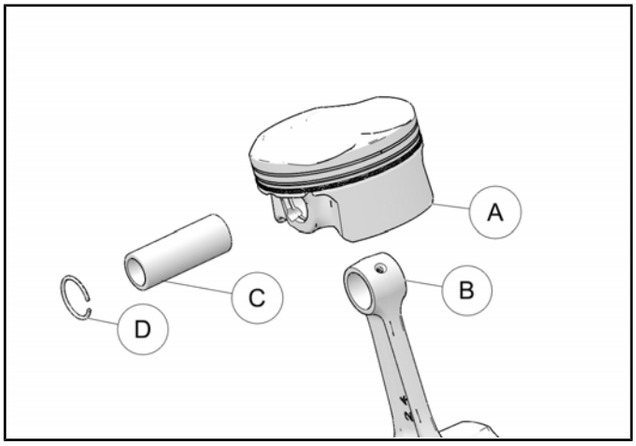


4. Place piston (A) on connecting rod (B). Push piston pin (C) through rod and piston until it seats against the installed circlip.

   NOTE: Do not tap on pin or cause any sideways force to connecting rod. Warm piston crown with a heat gun if pin cannot be installed by hand, or use a piston pin installation tool.

CAUTION

DO NOT apply heat to piston rings or a loss of radial tension could result.



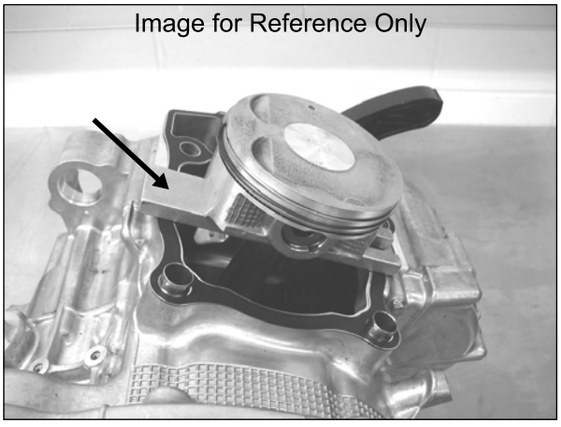
5. Install the remaining circlip (D) with gap at the top (12:00 position) or bottom (6:00 position). Push the piston pin in both directions to make sure the clips are properly seated in the groove.

Cylinder Installation

1. Clean base gasket sealing surface on cylinder and crankcase to remove all oil, grease, or old sealant.
2. Install a new base gasket.

   NOTE: Base gasket and surfaces must be DRY and oil free. Use care upon assembly to keep oil away.

3. Slide a commercially available Piston Support Block under piston skirt as shown to support piston during cylinder installation.



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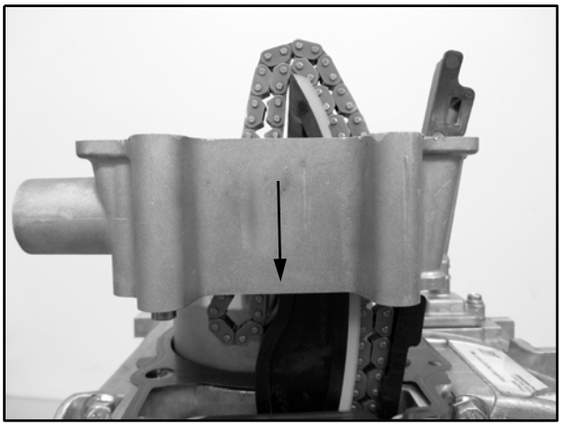
4. Apply clean engine oil to cylinder bore and bottom tapered portion of cylinder sleeve.
5. Verify all ring end gaps are correctly located on piston. Place cam chain and guides in alignment with chain room.
6. Carefully compress rings with fingers or commercially available spring compression tool and install cylinder with a slight front to back rocking motion until all rings are captive in cylinder and past the taper of the sleeve.
7. Remove support block and ring compressor.
8. Push cylinder downward until fully seated on base gasket.



9. Hold the cylinder in place and rotate the engine and position the piston at TDC.

   NOTE: If cam chain and flywheel are installed (top end work only is being performed) hold cam chain tight while rotating the engine to avoid damage to the chain, drive sprocket teeth, or tensioner blade.

Cylinder Head Installation

NOTE: Head gasket and surfaces must be DRY and oil free. Use care during assembly to keep oil and finger prints off of gasket.

1. Prepare cylinder head gasket sealing surfaces by cleaning thoroughly to remove all residue. The new head gasket must be installed clean and dry, free from oil or grease.

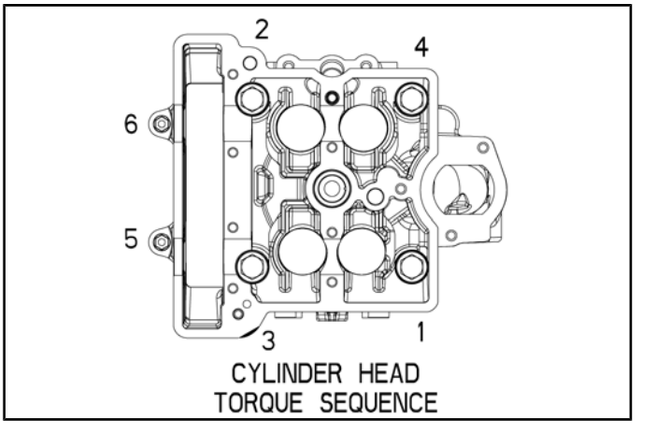
   NOTE: Do not touch sealing surfaces of the new head gasket.

2. Guide cam chain (D) through a new head gasket (E) and install the gasket on the cylinder, locating it on the alignment pins.
3. Carefully set the cylinder head (F) in place on alignment pins.

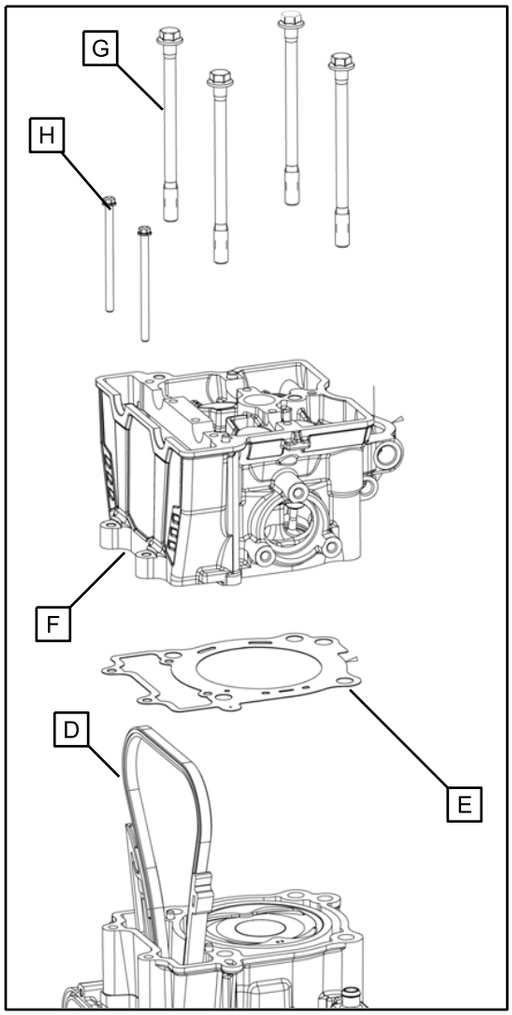
   NOTE: Install *new* cylinder head bolts.

4. Install and finger tighten the (4) *new* cylinder head bolts (G) evenly.
5. Install and finger tighten the (2) *new* outer M6 bolts (H) evenly.
6. Torque the *new* cylinder head bolts in sequence to specification.

= T
Cylinder Head Torque Procedure: **Torque in sequence** **Step 1: 21 ft-lbs (28 Nm)** **Step 2: 26 ft-lb (35 Nm)** **Step 3: Additional 135°** **Step 4: M6 bolts: 8 ft-lb (10 Nm)**

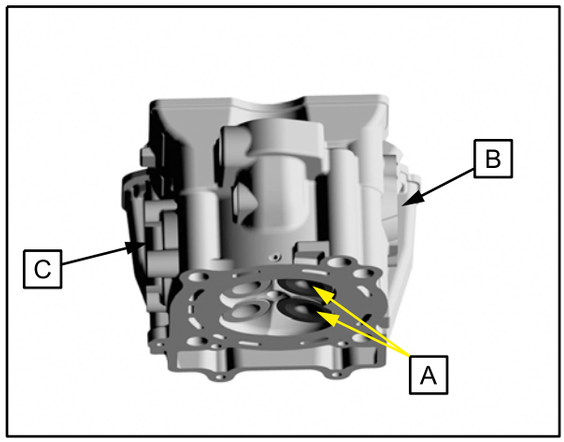


CYLINDER HEAD
TORQUE SEQUENCE



Valve Sealing Test

1. Clean and dry the combustion chamber area (A).
2. Pour a small amount of clean solvent into each intake port (B) and check for leakage around the valves. The valve seats should hold fluid with no seepage.
3. Repeat for exhaust valves by pouring fluid into each exhaust port (C).



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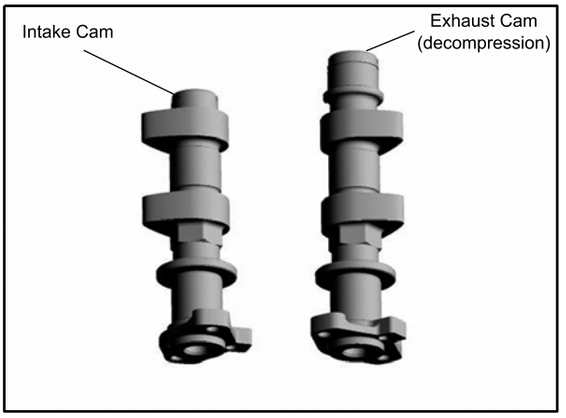
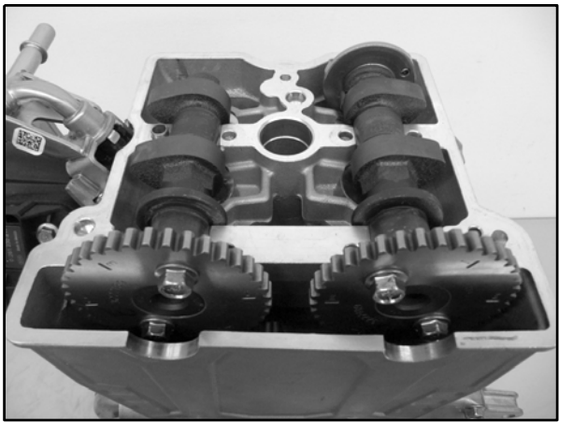
Valve Clearance Check / Adjustment

NOTE: Always inspect valve clearance prior to camshaft installation or final engine assembly.

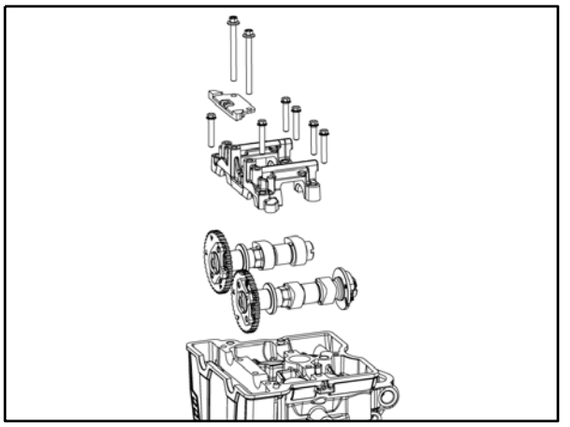
1. Install the cam chain guides and cam chain before camshaft installation (if removed) as outlined in this chapter.
2. Reference the camshaft intake and exhaust markings made during disassembly. If installing new camshafts or if camshafts were not marked, you can reference the part number stamped on the end of the shafts.



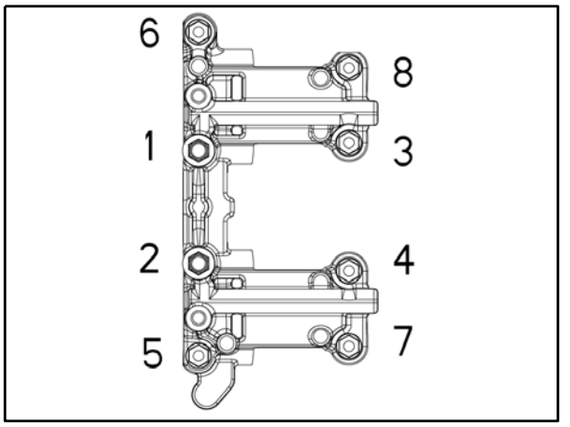
3. Lubricate the camshaft bearing journal surfaces with Polaris PS-4 engine oil prior to installation.
4. Carefully install the camshafts into the cylinder head. The camshaft lobes should face out.



5. Carefully install the camshaft carrier onto the camshafts.
6. Install the upper cam chain guide and the (8) bolts that retain the camshaft carrier.



7. Torque the camshaft carrier bolts in sequence to specification.



= T
Camshaft Carrier Bolts: **8 ft-lb (11 Nm)**

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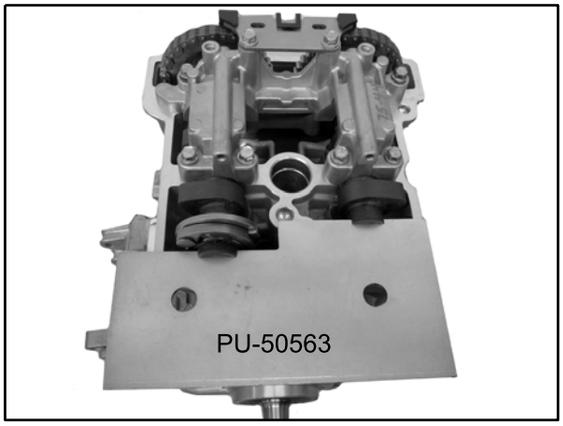
8. Install the Cylinder Holding and Camshaft Timing Plate (PU-50563) into the end of camshafts as shown below. The thermostat housing must be removed to install the timing plate PU-50563.



9. Measure the valve clearance of each valve using a thickness (feeler) gauge. Record the measurement if clearance is out of specification.

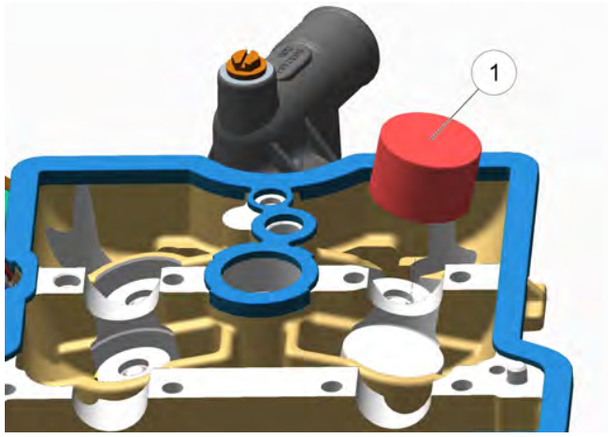
= In. / mm.
Intake Valve Clearance (cold): .006 ± .002″ (0.150 ± .050 mm)

= In. / mm.
Exhaust Valve Clearance (cold): .008 ± .002″ (0.200 ± .050 mm)

10. If any of the valve clearance measurements are out of specification, remove the camshaft carrier and camshafts and proceed with this procedure.

    NOTE: If all valve clearance measurements are within specification, remove the camshaft carriers and proceed to "Camshaft Installation / Timing".

11. Remove the valve tappet (Item 1) from a valve that was out of specification.



    NOTE: Keep mated parts together and in order with respect to their location in the cylinder head for assembly purposes. Mark each component or place them in an organized rack as you remove them.

12. Record the 3 digit number engraved on top of the tappet.
13. Reference the valve clearance measurement recorded for that valve, along with the 3-digit tappet number.
14. Refer to the appropriate tappet selection matrix (Intake or Exhaust) on the following pages and select the proper tappet.
15. Install the new tappet.

    NOTE: Lubricate the outer portion of the valve bucket upon installation.

16. Repeat steps until all necessary valves have been adjusted.
17. Reinstall the camshafts and camshaft carriers and tighten the bolts evenly to specification.

= T
Camshaft Carrier Bolts: 7.5 in-lbs (10 Nm)

18. Measure and confirm that valve clearance is now within specification for each valve.
19. If valve clearance is not within specification, repeat this procedure.

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20. If all valve clearance measurements are now within specification, remove the camshaft carriers and proceed to “Camshaft Installation / Timing”.

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Intake Valve Lash - Tappet Selection Matrix

Tappet Thickness: Example 440 equals thickness of 4.40 mm. Part Number: 5138477-XXX (X's represent 3 digits on tappet)


= In. / mm.

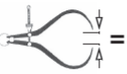
Exhaust Valve Clearance:
0.006 ± 0.002" (0.15 ± 0.5 mm)

Intake Valve Clearance Before Adjusting (mm)	Existing Valve Lash Tappet Marking (3 digits on tappet)	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525
	Correct Valve Lash Tappet Marking (3 digits on tappet)																																			
0.000-0.024		428	430	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512
0.025-0.049		430	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515
0.050-0.074		432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518
0.075-0.099		435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520
0.100-0.200 (Standard)																																				
0.201-0.225		448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532
0.226-0.250		450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535
0.251-0.275		452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538
0.276-0.300		455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540
0.301-0.325		458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542
0.326-0.350		460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545
0.351-0.375		462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545	
0.376-0.400		465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545		
0.401-0.425		468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545			
0.426-0.450		470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545				
0.451-0.475		472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545					
0.476-0.500		475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545						
0.501-0.525		478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545							
0.526-0.550		480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545								
0.551-0.575		482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545									
0.576-0.600		485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545										
0.601-0.625		488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545											
0.626-0.650		490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545												
0.651-0.675		492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545													
0.676-0.700		495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545														
0.701-0.725		498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545															
0.726-0.750		500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																
0.751-0.775		502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																	
0.776-0.800		505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																		
0.801-0.825		508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																			
0.826-0.850		510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																				
0.851-0.875		512	515	518	520	522	525	528	530	532	535	538	540	542	545																					
0.876-0.900		515	518	520	522	525	528	530	532	535	538	540	542	545																						
0.901-0.925		518	520	522	525	528	530	532	535	538	540	542	545																							
0.926-0.950		520	522	525	528	530	532	535	538	540	542	545																								
0.951-0.975		522	525	528	530	532	535	538	540	542	545																									
0.976-1.000		525	528	530	532	535	538	540	542	545																										

Exhaust Valve Lash - Tappet Selection Matrix

Example:

Tappet Thickness: Example 440 equals thickness of 4.40 mm. Part Number: 5138477-XXX (X's represent 3 digits on tappet)



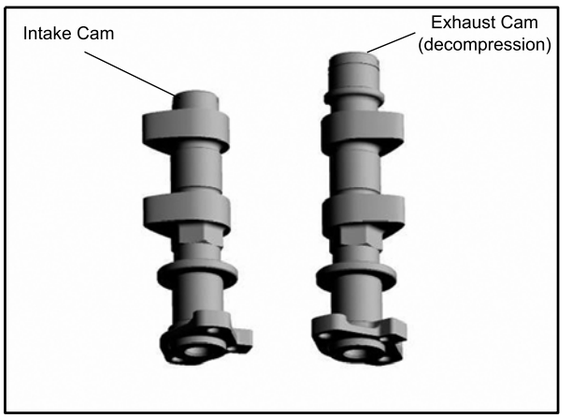
Exhaust Valve Clearance (cold):
.008 ± .002″ (0.200 ± .50 mm)

Exhaust Valve Clearance Before Adjusting (mm)	Existing Valve Lash Tappet Marking (3 digits on tappet)																																										
		440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525							
		Correct Valve Lash Tappet Marking (3 digits on tappet)																																										
	0.000-0.024	420	422	425	428	430	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505							
	0.025-0.049	422	425	428	430	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508							
	0.050-0.074	425	428	430	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510							
	0.075-0.099	428	430	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512							
	0.100-0.124	430	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515							
	0.125-0.149	432	435	438	440	442	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518							
	0.150–0.250 (Standard)																																										
	0.251–0.275	445	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530							
	0.276–0.300	448	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532							
	0.301–0.325	450	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535							
	0.326–0.350	452	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538							
	0.351-0.375	455	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540							
	0.376-0.400	458	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542							
	0.401-0.425	460	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545							
	0.426-0.450	462	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545								
	0.451-0.475	465	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545									
	0.476-0.500	468	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545										
	0.501-0.525	470	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545											
	0.526-0.550	472	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545												
	0.551-0.575	475	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545													
	0.576-0.600	478	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545														
	0.601-0.625	480	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545															
	0.626-0.650	482	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																
	0.651-0.675	485	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																	
	0.676-0.700	488	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																		
	0.701-0.725	490	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																			
	0.726-0.750	492	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																				
	0.751-0.775	495	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																					
	0.776-0.800	498	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																						
	0.801-0.825	500	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																							
	0.826-0.850	502	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																								
	0.851-0.875	505	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																									
	0.876-0.900	508	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																										
	0.901-0.925	510	512	515	518	520	522	525	528	530	532	535	538	540	542	545																											
	0.926-0.950	512	515	518	520	522	525	528	530	532	535	538	540	542	545																												
	0.951-0.975	515	518	520	522	525	528	530	532	535	538	540	542	545																													
	0.976-1.000	518	520	522	525	528	530	532	535	538	540	542	545																														

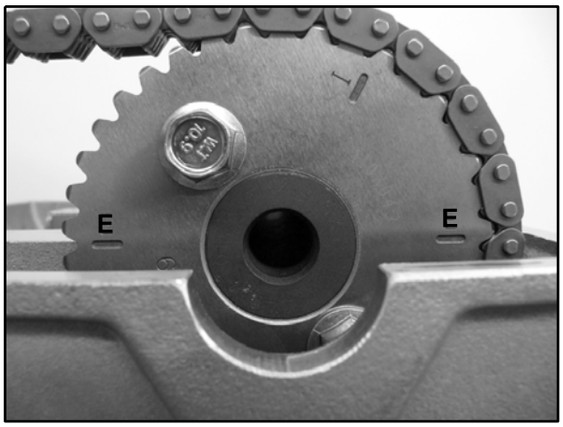
Camshaft Installation / Timing

NOTE: If any valve train components were replaced, refer to "Valve Clearance Adjustment" procedure prior to "Camshaft Installation / Timing".

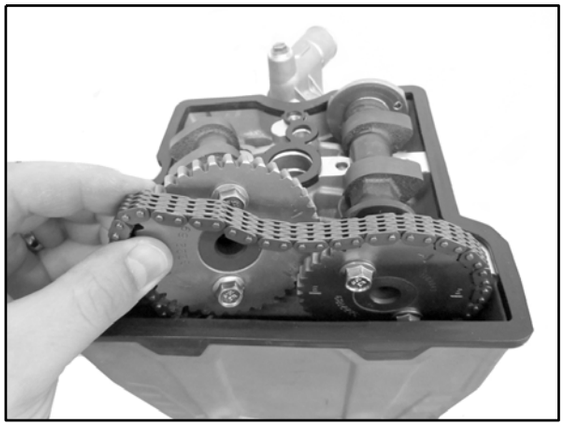
1. Rotate the engine and position the piston at TDC.
2. Reference the intake and exhaust markings made during disassembly.

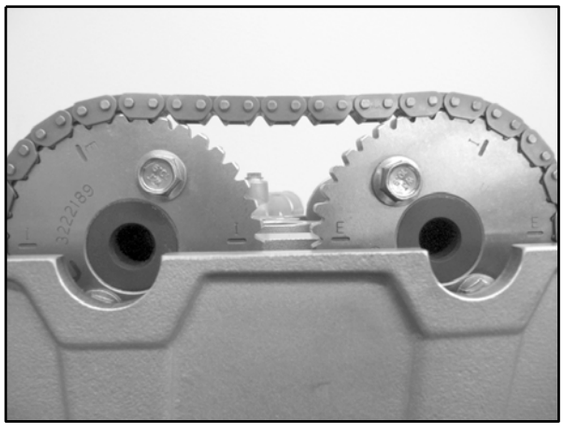


3. Lubricate all camshaft lobes and bearing journal surfaces with Polaris PS-4 Plus engine oil prior to installation.
4. Place the exhaust cam into the cylinder head and align the timing marks as shown below.



5. Wrap the cam chain around the exhaust cam sprocket and hold the exhaust cam in its current position.
6. Carefully install the intake cam at an angle to allow for cam chain installation. Roll the cam shaft into its bearing pockets and verify that the timing marks are in alignment as shown below.





NOTE: Intake cam sprocket should have "I" marks aligned with gasket surface and the exhaust cam sprocket should have "E" marks aligned with gasket surface.

7. Carefully install the camshaft carrier onto the camshafts.

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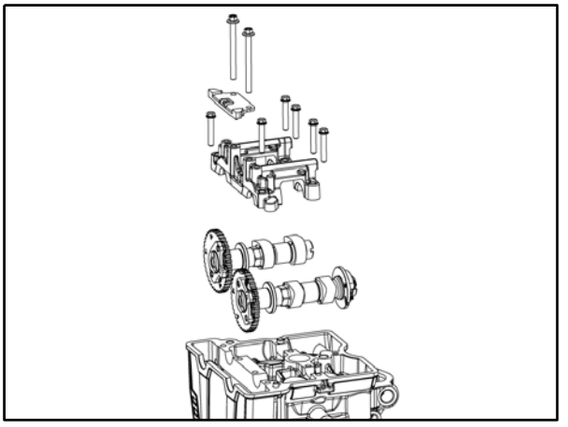
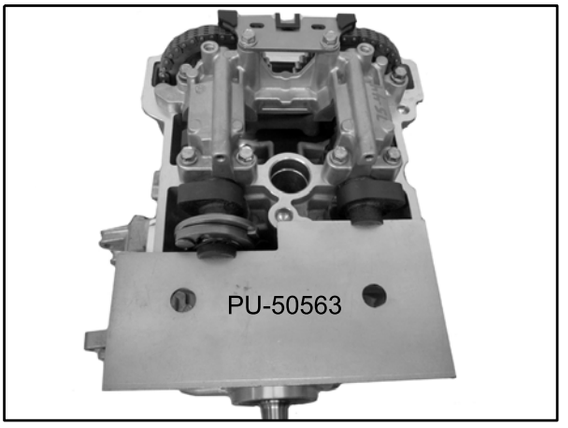
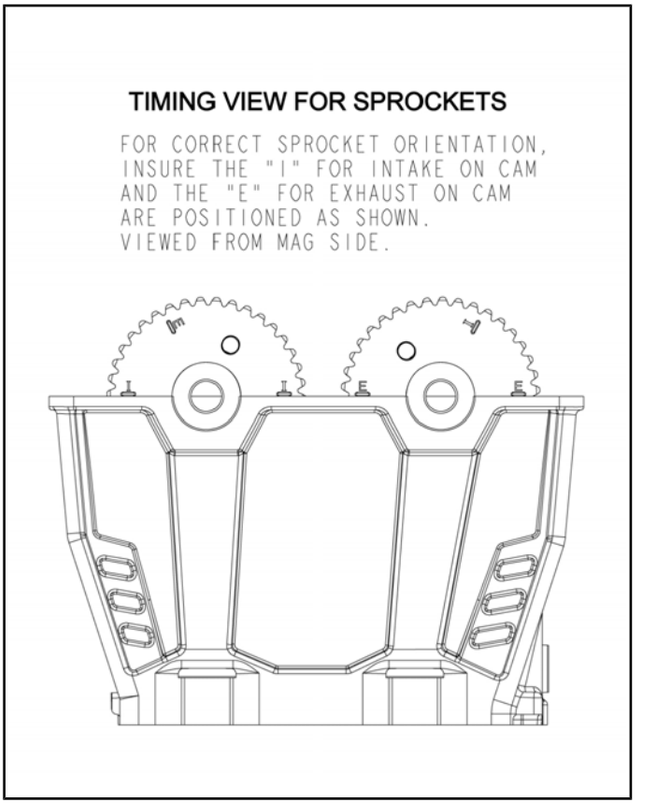
8. Install the upper cam chain guide and the (8) bolts that retain the camshaft carrier. Tighten the bolts evenly until snug. Do not torque at this time.



9. Install the Cylinder Holding and Camshaft Timing Plate (PU-50563) into the end of camshafts as shown.

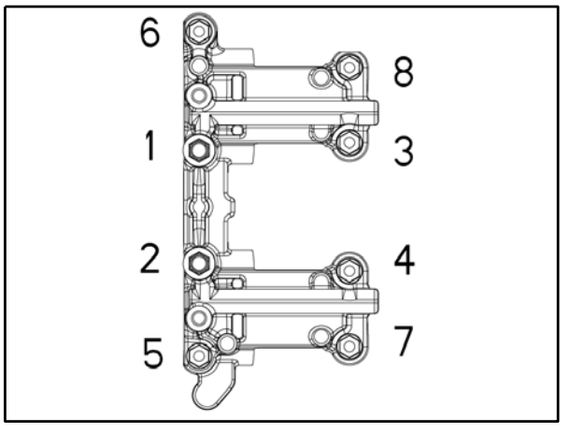


10. Verify cam timing is correct and the piston is a TDC.



11. If timing marks are not aligned:
    - Remove the Camshaft Timing Plate (PU-50563) from the end of the camshafts.
    - Remove the cam carrier bolt and cam carrier.
    - Correct the camshaft timing as needed.
    - Reinstall the cam carrier.
    - Re-check cam timing.
12. Remove the Cylinder Holding & Camshaft Timing Plate (PU-50563) from the end of the camshafts.
13. If needed, install the camshaft carrier and bolts.

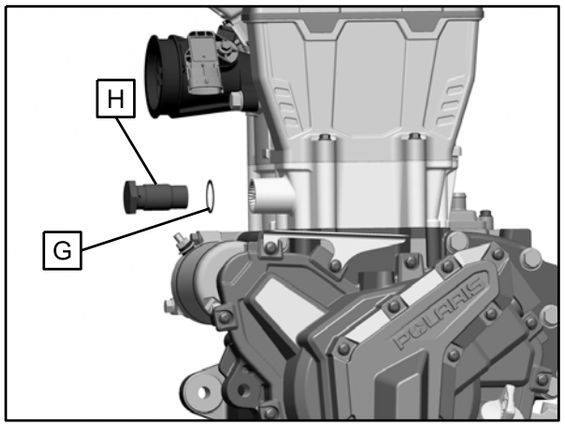
14. Torque the camshaft carrier bolts in sequence to specification.



= T
Camshaft Carrier Bolts: **8 ft-lb (11 Nm)**

15. Insure the *new* sealing washer (G) is in place.

16. Install the hydraulic cam chain tensioner (H) into the cylinder and torque to specification.



= T
Cam Chain Tensioner: **30 ft-lb (41 Nm)**

17. Rotate crankshaft through two revolutions and verify camshaft timing is correct.

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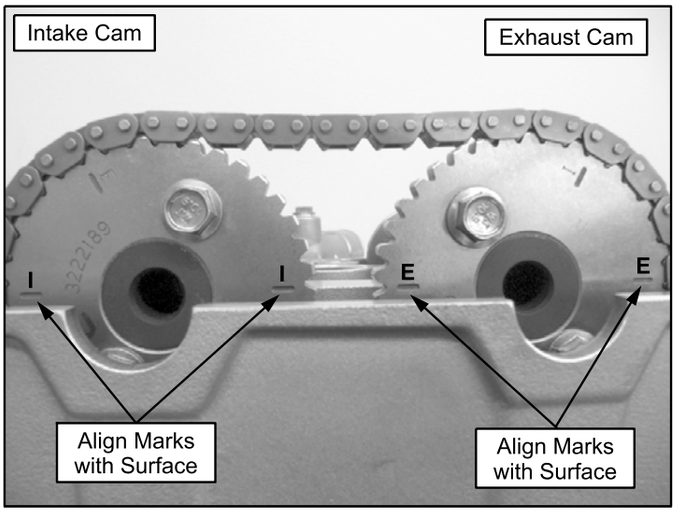
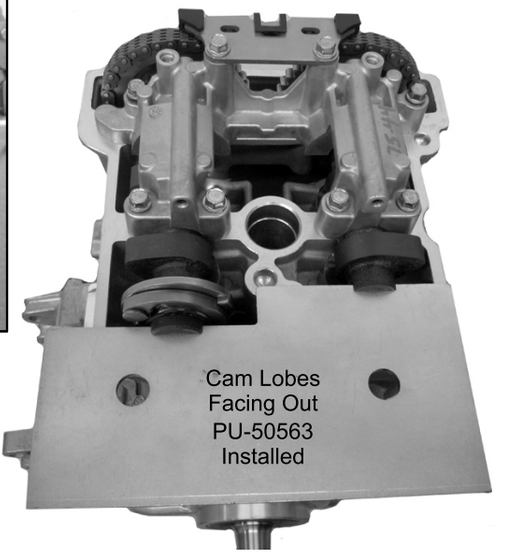
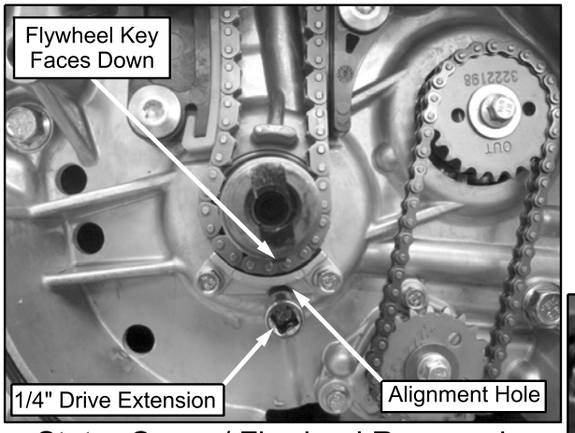
Camshaft Timing - Quick Reference



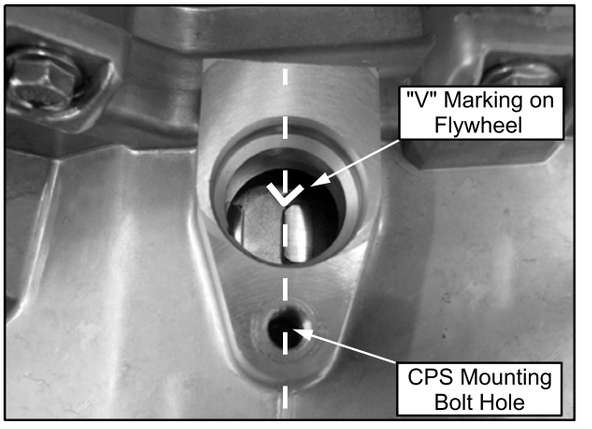
TOP END





Stator Cover / Flywheel Removed

Stator Cover / Flywheel Installed



BOTTOM END

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Valve Cover Installation

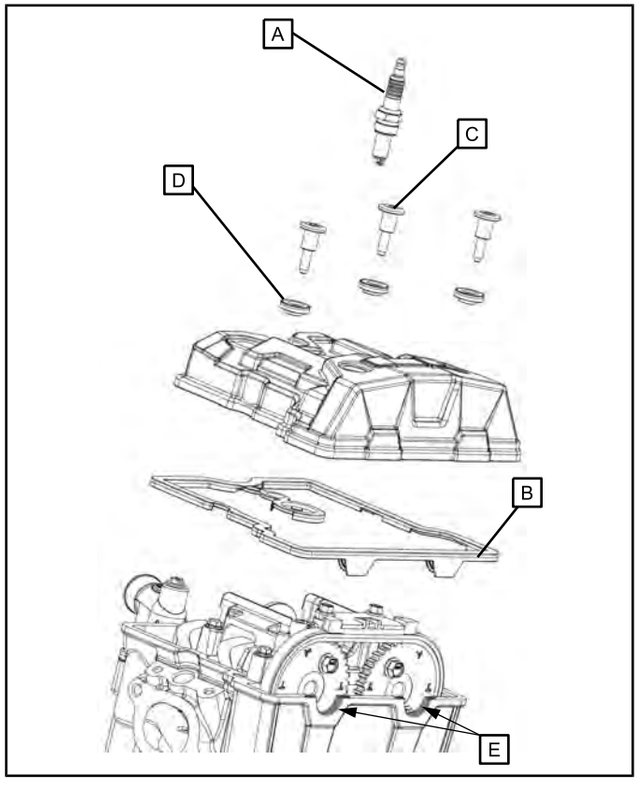
1. Apply Anti-seize and install the spark plug (A) and torque to specification.

= T
Spark Plug: **14 ft-lbs (19 Nm)**

2. Prepare valve cover sealing surfaces by cleaning thoroughly to remove all residue.
3. Apply a small amount of crankcase sealant to the cylinder head half-moon cutouts (E) as shown.

Crankcase Sealant: 2871557

4. Install a *new* valve cover seal (B).
5. Install the (3) valve cover shoulder bolts (C) and isolators (D) using a T40 driver.



6. Torque valve cover bolts to specification.

= T
Valve Cover Bolts: **9 ft-lbs (12 Nm)**

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ENGINE DISASSEMBLY / INSPECTION - LOWER END

Crankcase Disassembly

NOTE: The engine top end, starter motor, stator cover, starter drive, flywheel, stator, cam chain, oil pump and sprockets can be serviced with the engine installed in the vehicle.

Flywheel / Stator Housing Removal

1. Remove the stator cover as outlined in the ”Water Pump Mechanical Seal / Oil Seal Replacement” procedure” in this chapter.

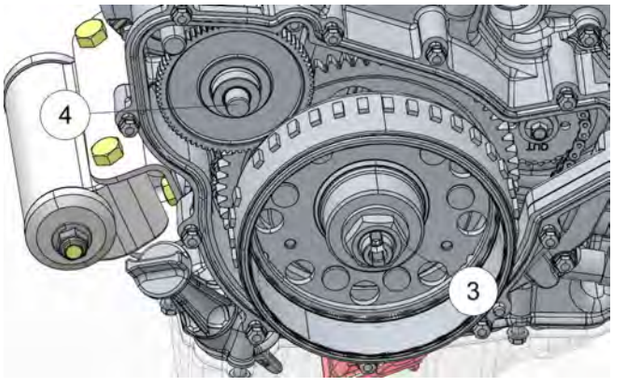
CAUTION

The flywheel contains powerful magnets. Use caution when removing the stator cover.
DO NOT place fingers between cover and crankcase at any time during the removal process or injury could result.

CAUTION

Be sure engine coolant does not contaminate the engine oil during stator cover service.

2. Remove starter drive gear and shaft(4). Inspect gear teeth for damage. Inspect fit of shaft inside gear and replace gear assembly if clearance is excessive. Inspect shaft and shaft bearing surfaces in case and stator housing for wear.



3. Hold flywheel with a commercially available strap wrench and remove flywheel nut and washer. Discard the flywheel nut and replace for assembly.

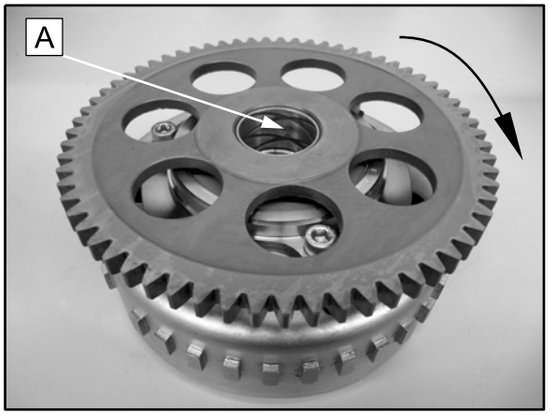
   NOTE: The flywheel nut has standard rotation (right hand) threads.

4. Back the center screw of flywheel puller PA-49316 completely out and screw puller onto flywheel completely.

5. Tighten center bolt of tool PA-49316 and remove flywheel.

Starter One-Way Clutch Inspection

1. Remove flywheel as outlined in this chapter.
2. Place flywheel on work bench. Grasp gear and rotate clockwise. It should turn smoothly without binding.
3. Rotate gear counterclockwise. The gear should immediately lock in position and not slip.
4. Inspect inside of hub (A) for wear, galling, or uneven surface.



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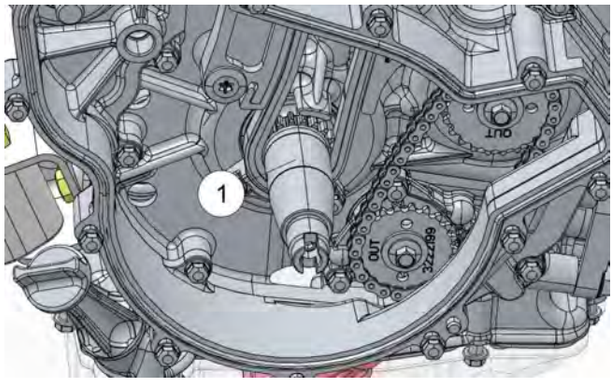
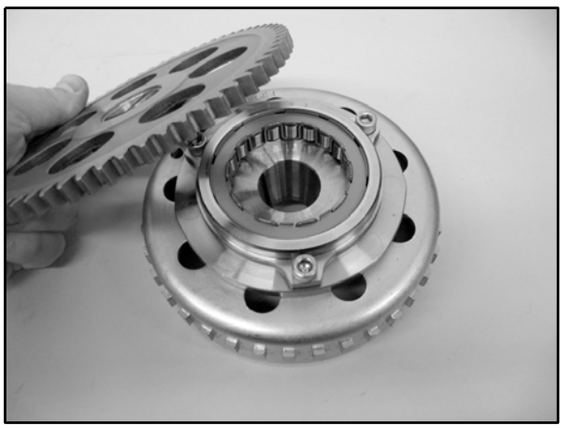
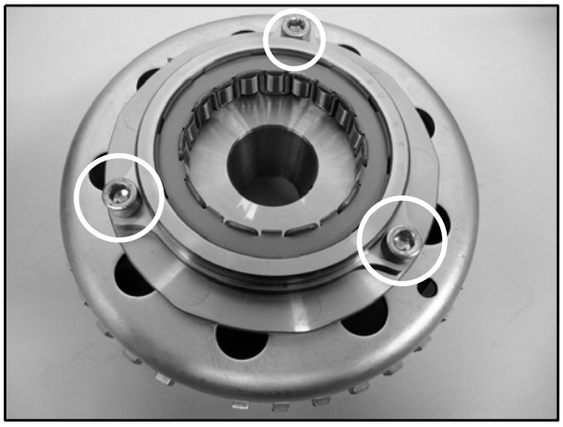
5. Inspect crankshaft bearing surface (1) for abnormal wear.



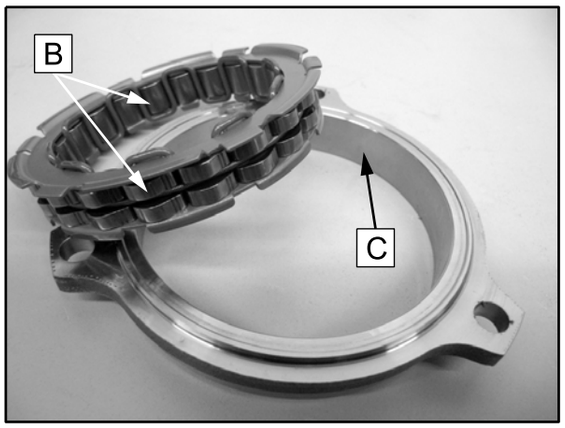
6. Remove starter gear from the flywheel assembly.



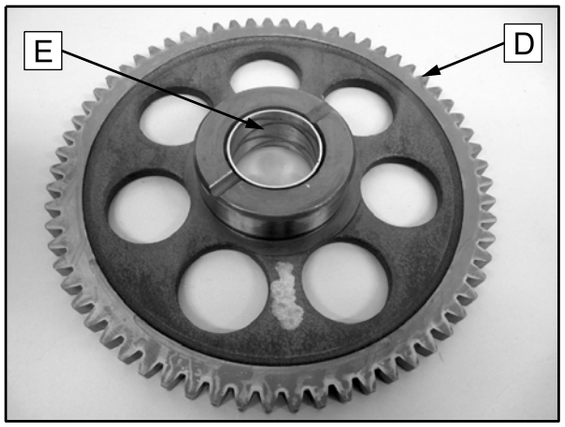
7. Remove the (3) one-way clutch retaining bolts.



8. Remove clutch and inspect both sides of drive rollers (B) and roller contact surface (C) inside hub for wear, damage, or uneven surface.



9. Inspect drive surface of starter gear (D) and bearing surface (E) for wear, damage, or uneven surface. If any starter clutch component is worn or damaged, replace clutch, clutch hub, and starter gear.



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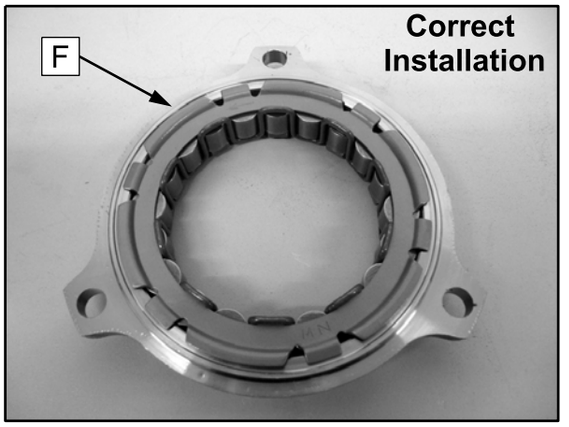
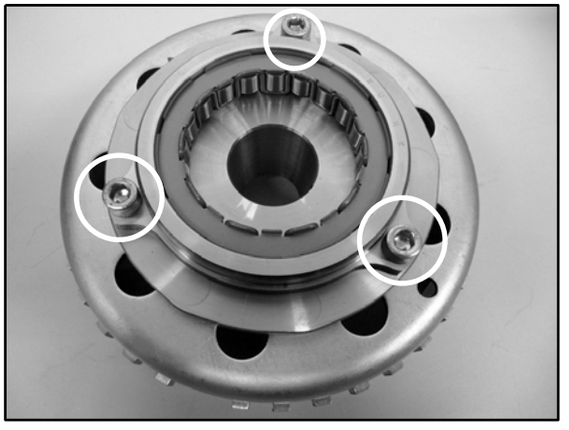
Starter One-Way Clutch Installation

1. Install one-way clutch in clutch hub with flange of clutch (F) engaged in recess.



NOTE: The one-way clutch can be installed into the hub incorrectly. This will cause engine cranking issues.

2. Clean screw threads in flywheel to remove all oil or grease.
3. Apply Loctite® 272™ on the (3) bolts. Place hub on flywheel and install (3) bolts.
4. Torque screws to specification.

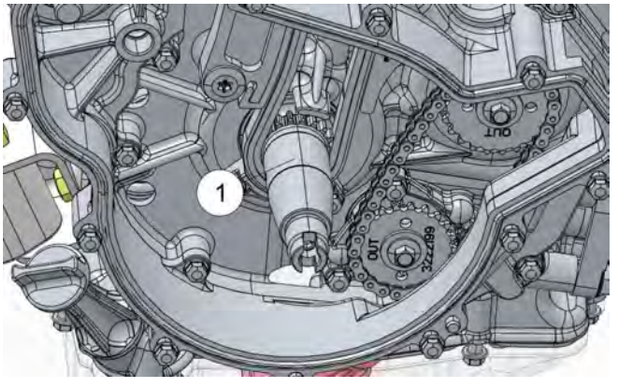


= T
One Way Clutch Retaining Bolts: **9 ft-lbs (12 Nm)** **Apply Loctite® 272™**

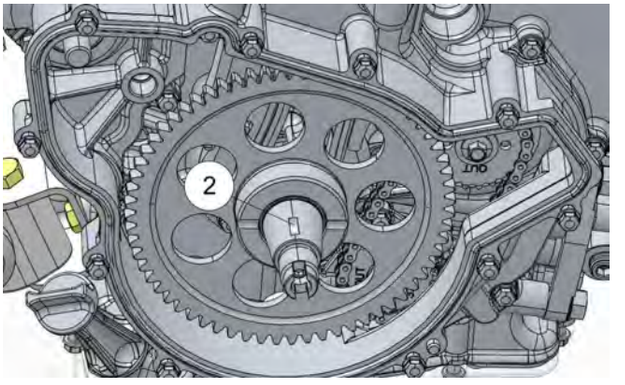
Flywheel Installation

1. Clean the threads, taper and flat of crankshaft to remove all oil or grease.
2. Clean flywheel taper to remove all oil or grease.

3. Apply a small amount of PS4 engine oil to the flat area (1) on the MAG side crankshaft. DO NOT apply engine oil to the crankshaft taper.



4. Rotate crankshaft so the flywheel key (2) is facing upward.



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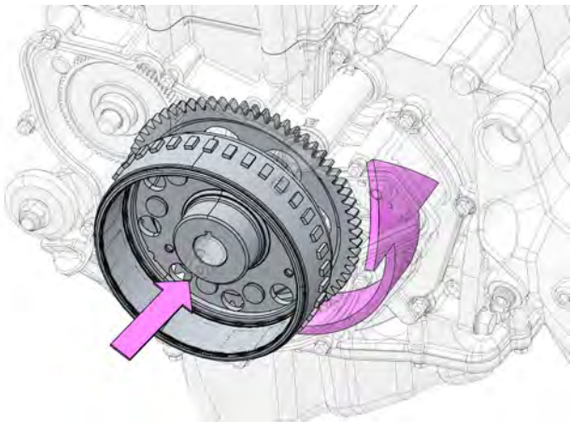
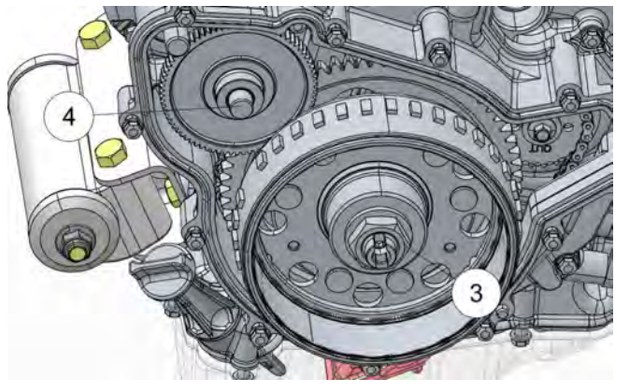
5. Fully install the Freewheel gear (starter gear) onto the crankshaft as shown.
6. Align the flywheel keyway with flywheel key on the crankshaft.
7. By hand, lightly press the flywheel inward while rotating the freewheel gear counter clock-wise. Fully install the flywheel until seated on the crankshaft taper.



8. Install the flywheel washer.
9. Hold flywheel with commercially available strap wrench.
10. Torque *new* flywheel nut (3) to specification.



= T
Flywheel Retaining Nut: **133 ft-lbs (180 Nm)**

11. Install starter idler gear and shaft (4).

Stator Removal

NOTE: Test stator wire continuity before removing it from the housing.

1. Remove the stator cover as outlined in the ”Water Pump Mechanical Seal / Oil Seal Replacement” procedure” in this chapter.

CAUTION

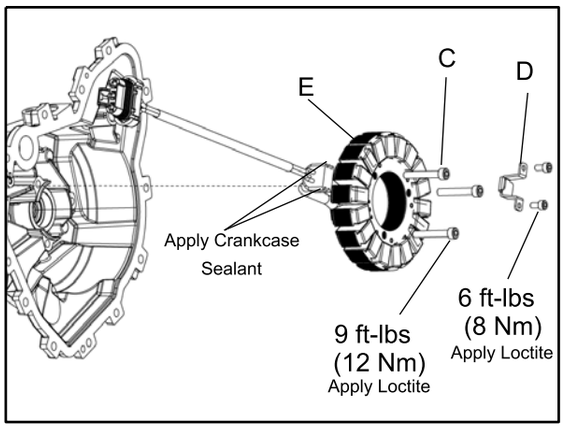
The flywheel contains powerful magnets. Use caution when removing the stator cover.
DO NOT place fingers between cover and crankcase at any time during the removal process or injury could result.

2. Remove and discard the stator cover gasket.

CAUTION

Be sure engine coolant does not contaminate the engine oil during stator cover service.

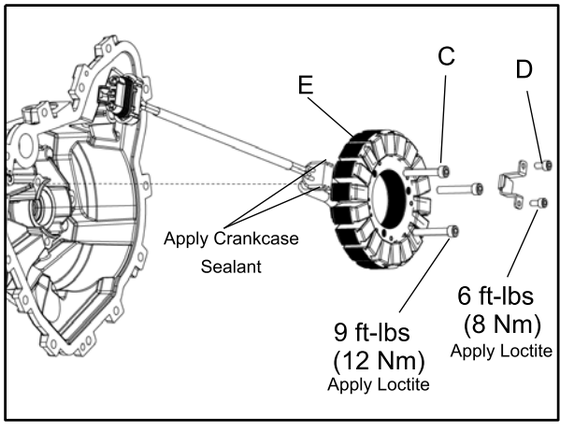
3. Remove the 3 bolts (C) that secure the stator to the stator cover.
4. Remove the 2 bolts that secure the stator wire routing bracket (D) to the stator cover.
5. Remove the stator (E) from the stator cover.



Stator / Stator Cover Installation

1. Clean and degrease screws and threads in stator housing.
2. Clean mounting surfaces of stator and housing.

3. Apply crankcase sealant to edges of rubber stator grommet as shown below.
4. Set the stator in housing and press wire grommet into slot on housing.
5. Apply Loctite® 242™ to end (8-10 threads) of (3) stator screws (C) and the (2) wire routing bracket screws (D).
6. Install all (5) screws and torque to specification.



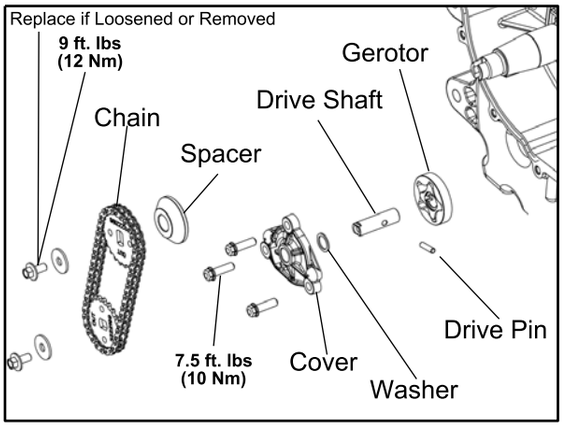
= T
Stator to Cover Retaining Bolts (C): **9 ft-lbs (12 Nm)** **Apply Loctite® 242™**

= T
Stator Wire routing Bolts (D): **6 ft-lbs (9 Nm)** **Apply Loctite® 242™**

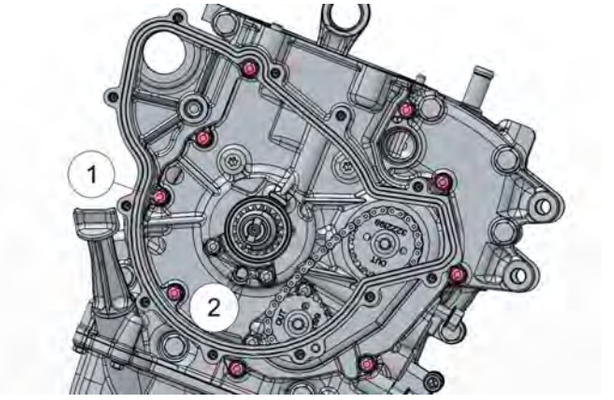
7. Install a *new* stator cover gasket into the engine.
8. Install the stator cover as outlined in this chapter.

CAUTION
The flywheel contains powerful magnets. Use caution when installing the stator cover. DO NOT place fingers between cover and crankcase at any time during the removal process or injury could result.

Oil Pump Removal



1. Remove the fasteners (1) retaining the intermediate (mag) portion of the crank case and remove this section of the crank case.



2. Rotate the crankshaft to TDC position by aligning the timing hole (2) in crankcase with a timing hole in the crankshaft. Insert a 1/4” drive socket extension through the crankcase and into the crankshaft locating hole.

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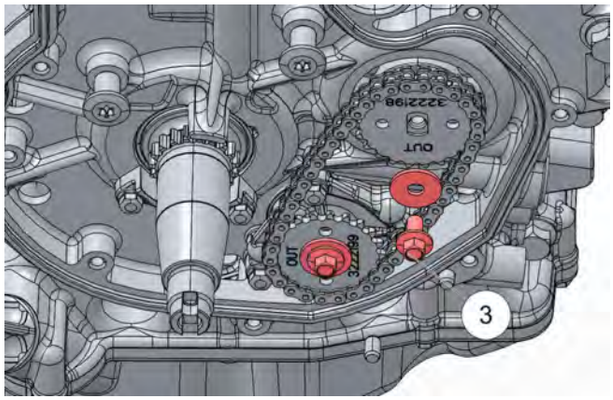
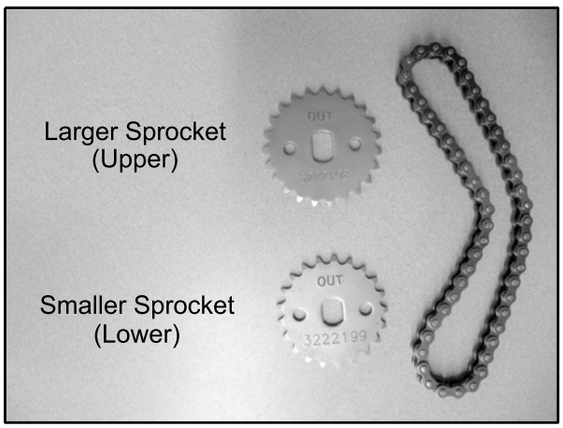
3. Remove the oil pump sprocket bolts(3) and washers. Discard the bolts and replace with new for assembly. Remove the sprockets and chain from the engine.

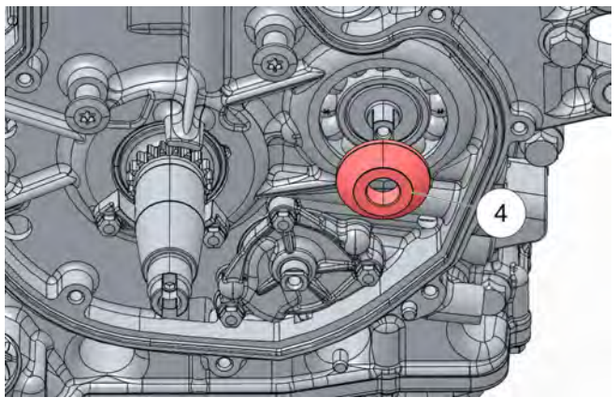


4. Inspect the oil pump chain for worn or missing rollers or damage. Chain should be replaced as a set with sprockets if sprocket teeth are worn.

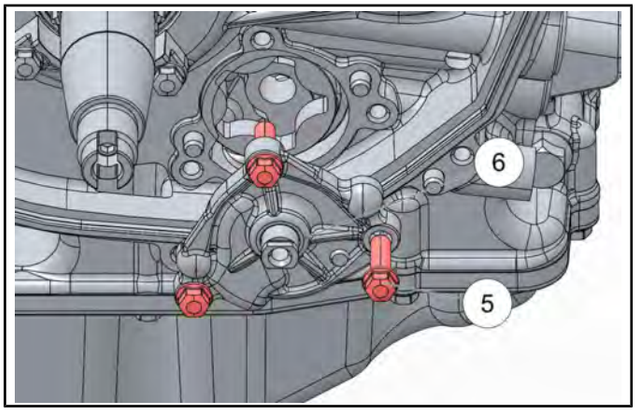


NOTE: The larger oil pump sprocket mounts to the balance shaft extension, the smaller oil pump sprocket mounts to the oil pump shaft.

5. Remove the upper oil pump sprocket spacer(4).



6. Remove the bolts(5) securing the oil pump cover to the crankcase.



7. Grasp the oil pump shaft(6) and pull it outward to remove the shaft, oil pump cover and inner oil pump gerotor. This will prevent the oil pump drive pin from falling out and into the crankcase.

NOTE: The gerotor set has (2) orientation dots that must be installed inward upon assembly

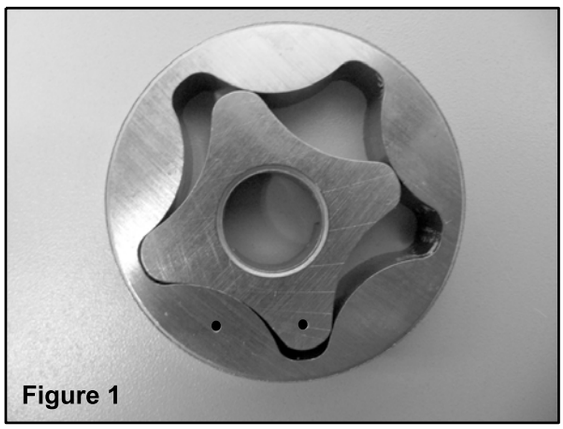


Figure 1

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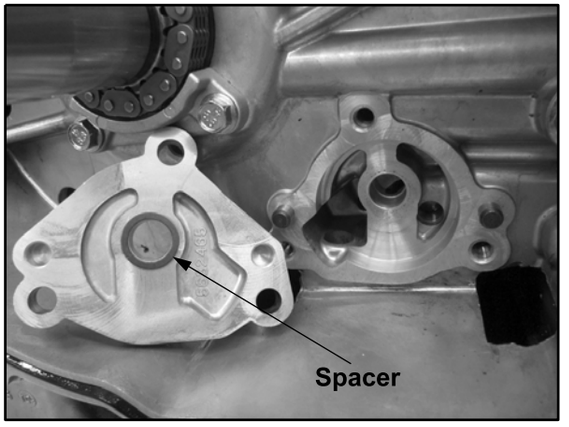
8. Remove the center gerotor, pin and shaft from the oil pump cover.

   NOTE: There is a spacer in between the inner oil pump gerotor and the oil pump cover.

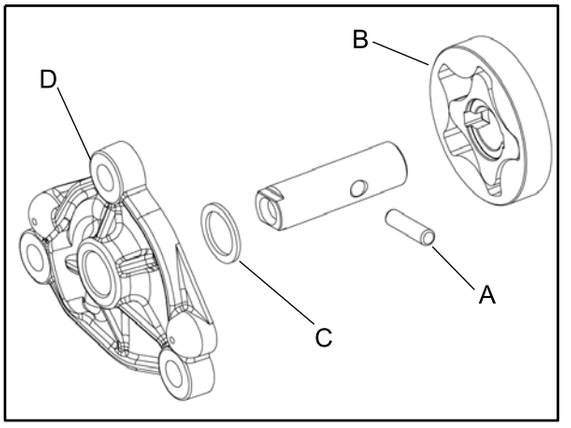
9. Remove the oil pump gerotor that is in the engine case (if needed).
10. Clean the gerotors to remove oil.
11. Inspect surfaces of pump cavity in crankcase and surface of pump cover for scoring or wear.



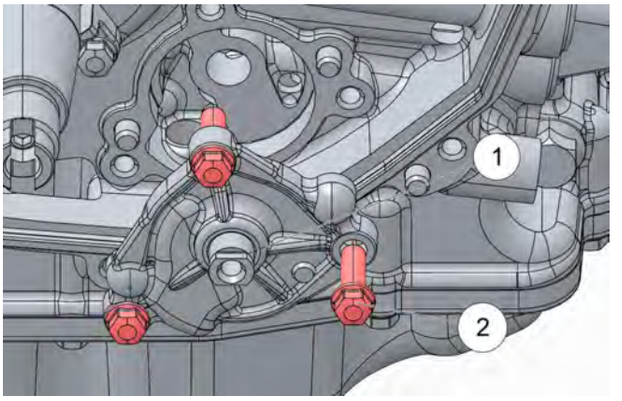
12. Inspect gerotor for scoring or other damage. Replace parts as a set if damaged.

Oil Pump Assembly

1. Clean and dry all parts thoroughly. Apply clean engine oil to all parts. Do not use gasket sealer on the pump cover mating surfaces.
2. Align the gerotor according to the orientation dots.
3. Place the drive pin (A) through the oil pump drive shaft.
4. Slide the gerotor (B) onto the drive shaft and lock them into position on the drive pin.
5. Install the washer (C) onto the drive shaft.
6. Install the oil pump cover (D) onto the shaft assembly.



7. Grasp the complete oil pump assembly by the drive shaft(1) and install the assembly into the crankcase.



8. Install the oil pump cover bolts (2) and torque to specification.

= T
Oil Pump Cover Bolt: **7.5 ft-lbs (10 Nm)**

9. Install the upper oil pump sprocket spacer.
10. Install the oil pump sprockets, chain, washer and *new* bolts. Oil pump sprockets must be installed in the correct position, with the word "**OUT**" facing out.

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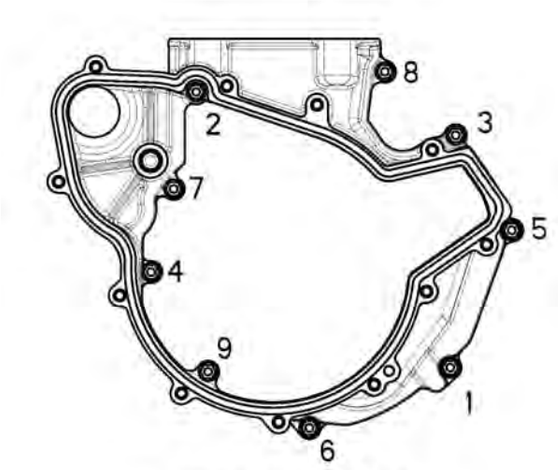
11. Torque sprocket bolts to specification.

= T
Oil Pump Sprocket Bolt: **9 ft-lbs (12 Nm)**

=
Oil Capacity: Approx. 2 Quarts (1.9 L) **Oil Filter Wrench:** PU-50105 or 2.5” (64 mm) **Oil Type:** Polaris PS-4 Synthetic Engine Oil **Oil Pressure** **Minimum Specification:** (using Polaris PS-4 Plus at operating temperature) 10 PSI @ 1200 RPM(Minimum) 40 PSI @ 7000 RPM(Minimum)

12. Prepare Inter (mag) and mag side crank case by clean all mating surfaces.
13. Apply a thin film of Crankcase Sealant (PN 2871557) evenly to a clean and oil-free MAG crankcase mating surface.
14. Install the inter (mag) crankcase bolts finger tight in MAG side crankcase.
15. Tighten all bolts evenly until snug.
16. Torque the *new* crankcase bolts to in sequence to specification.

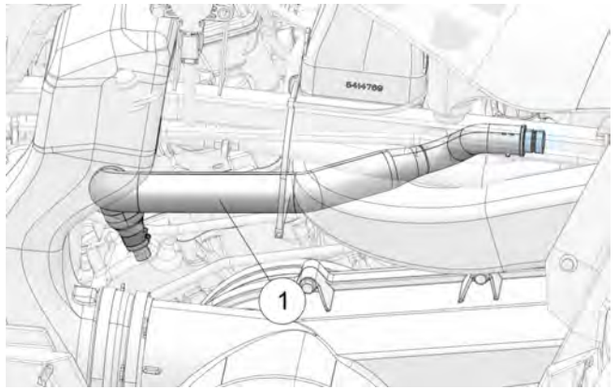


INTER (MAG) COVER
TORQUE SEQUENCE

= T
Crankcase Bolts (In Sequence): **12 ft-lbs (2 Nm)**

Crankcase Breather Valve / Hose

The breather valve is on the hose that runs between the engine and air box. Be sure breather line is routed properly and secured in place.



1. Remove the left side panel
2. Remove the hose clamps from the valve and pull the valve out of the hoses.

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3. Inspect the valve for debris. Blow gently through the valve to check for clogging. Replace a damaged or clogged valve.

   NOTE: In-line breather filter service life is extended when the foam air box pre-filter is in place and maintained properly. Never operate the engine without the pre-filter.

4. Check the hoses for cracks, deterioration, abrasion, or leaks. Replace as needed.

CAUTION

Make sure lines are not kinked or pinched.

5. Reinstall the valve and hose clamps.

⚠ CAUTION

Operation of your vehicle without a breather valve can cause engine damage. Always reinstall the breather valve after removing it for service.

6. Install the left side panel

Crankcase Separation

NOTE: Before the crankcase can be separated, be sure the entire top end, water pump stator, flywheel and oil pump assembly are removed from the engine as outlined in this chapter.

1. Remove the engine from the engine stand and lay it on a table so the magneto side is facing upward.

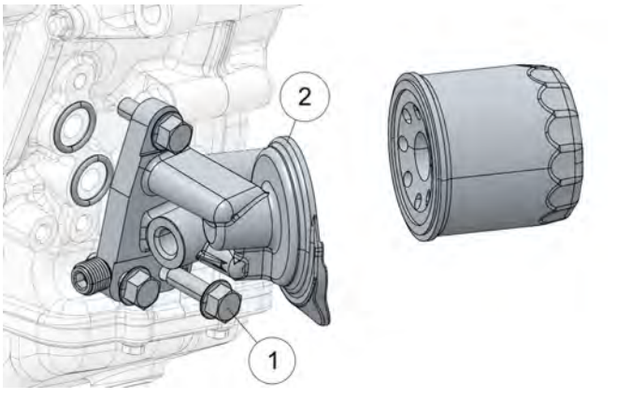
⚠ WARNING

Support the engine case with a non marring material to prevent damaging the PTO side of the crank shaft and any mating surfaces.

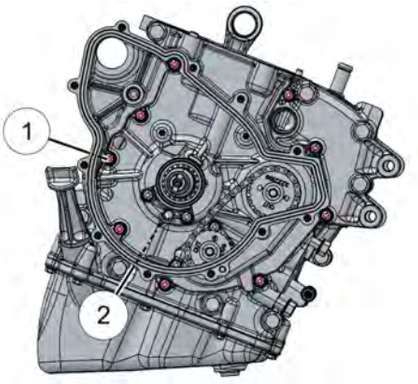
Ensure the crank case is stable before working on it.

2. Remove the oil pan at this time if it has not already been removed.

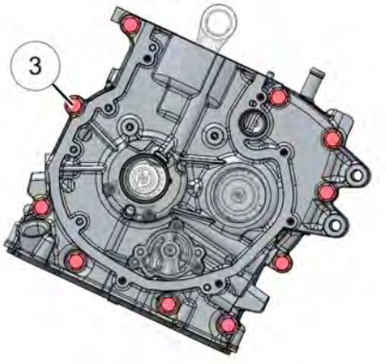
3. Remove the oil filter and the fasteners(1) that secure oil filter adapter (2) to the crankcase. Discard O-rings and through clean the adaptor for reassembly.



4. Remove and discard the flange bolts(1) fastening the intermediate (mag) cover evenly in a criss-cross pattern.



5. Remove and discard the flange bolts(3) fastening the magneto side crankcase evenly in a criss-cross pattern.



6. Separate crankcase by tapping with a soft faced hammer in reinforced areas and lift MAG crankcase off PTO case.

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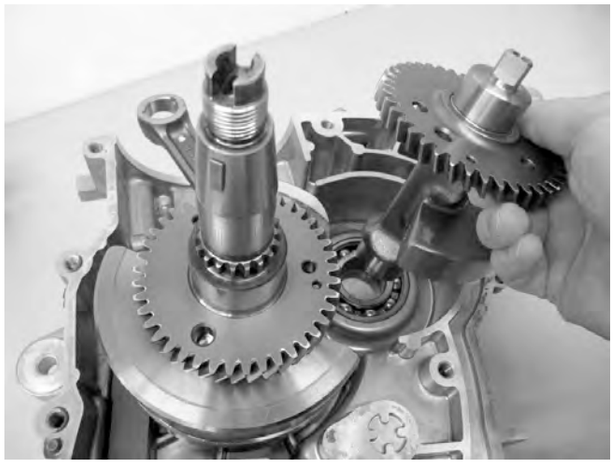
Balance Shaft Removal / Inspection

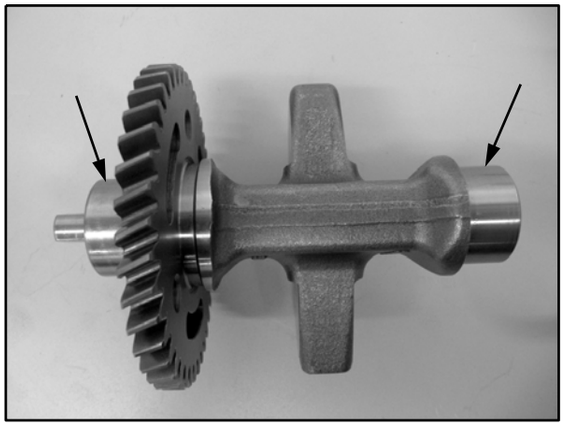
1. Rotate crankshaft to align the timing marks as shown below.

2. Pull upward on the balance shaft and remove it from the crankcase.



3. Inspect drive gear for broken or damaged teeth.

4. Inspect bearing surfaces for scoring or signs of wear.



5. Inspect / replace the balance shaft bearings in both crankcase halves. See “Crankcase Bearing Inspection / Removal” procedure in this chapter.

   NOTE: Due to extremely close tolerances and minimal wear, counterbalance shaft ball bearings must be inspected visually and by feel. Look for signs of discoloration, scoring or galling. Turn the inner race of each bearing. The bearings should turn smoothly and quietly. The outer race of each bearing should fit tightly in the crankcase bore. The inner race should be firm with minimal side to side movement and no detectable up and down (radial) movement.

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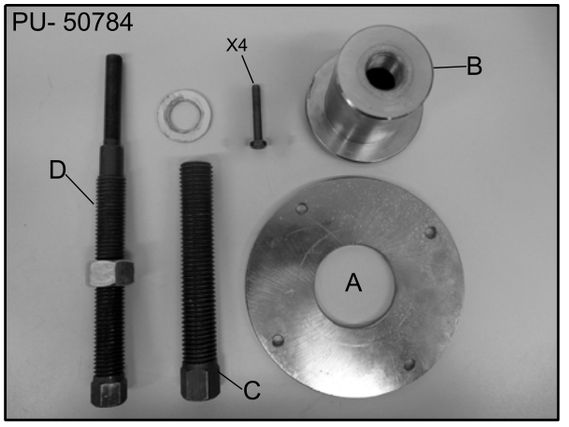
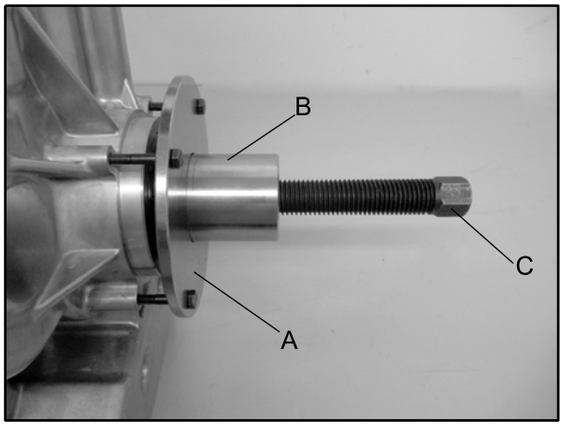
Crankshaft Removal

1. Remove the engine from the engine stand and place the assembly on a sturdy work bench.
2. Remove the bolts securing the bearing retainer plate to the crankcase. Remove the bearing plate.
3. Install the crankshaft removal / installation tool
4. PU-50784 on to the PTO side crank case.
   - Install plate “A” over adapter “B”.
   - Evenly attach the assembly onto the PTO side crankcase using the (4) bolts as shown below.
   - Thread the crankshaft removal screw “C” into adapter “B”.



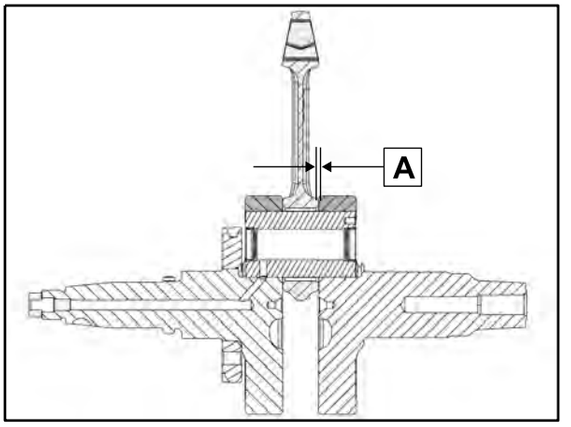


5. With the help of an assistant holding the crankshaft, slowly tighten the screw “C” until the crankcase is completely separated from the crankshaft.
6. Remove all special tools from the crankcase.

Crankshaft Inspection

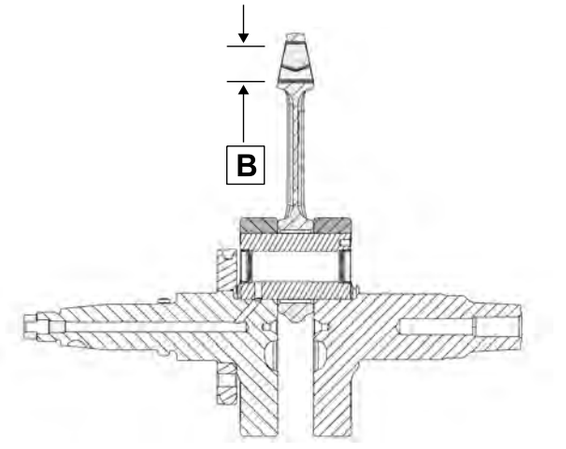
NOTE: The connecting rod uses plain bearings. The connecting rod bearings are not serviceable. If ANY excessive wear or movement is present or if the rod does not rotate on the crankshaft freely, the crankshaft assembly must be replaced.

1. Use a feeler gauge to measure the connecting rod big end side clearance (A).



Connecting Rod Big End Side Clearance:
0.00590-.01771” (.15 - .45mm)

2. Measure the connecting rod small end I.D. (B).



Small End I.D. Standard:
0.8665” - 0.8670” (22.010 - 22.023 mm)
Service Limit: 0.08682” (22.053 mm)

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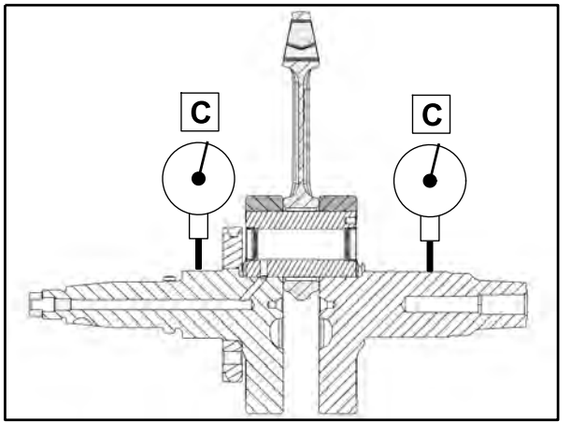
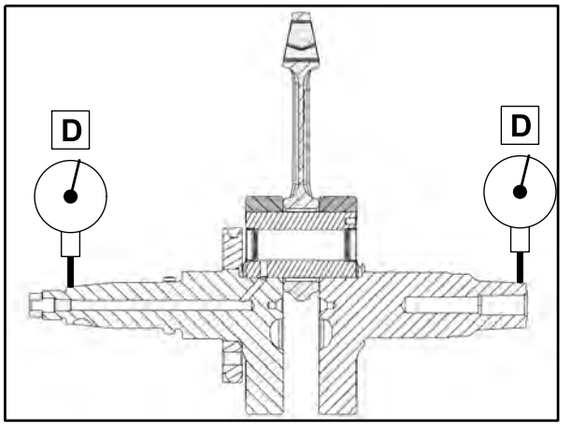
3. Place the crankshaft in a truing stand or V-blocks and measure the runout where indicated below with a dial indicator.





Maximum Runout:

Inner (C) - 0.00118” (0.03 mm)

Outer (D) - 0.00590” (0.15 mm)

NOTE: The MAG side crankshaft plain bearing is not serviceable. Crankcase replacement is required if the bearing is damaged or has excessive wear. The crankshaft is reusable if it meets specifications and MAG side bearing surface is not groved, pitted, damaged or excessively worn.

PTO Side Crankcase Bearing Service

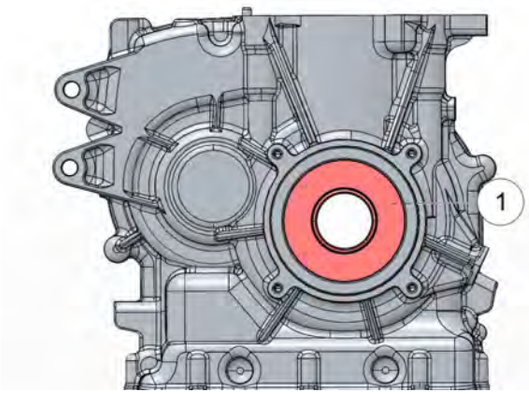
WARNING

Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. Look for signs of discoloration, scoring or galling. Turn the inner race of each bearing. The bearings should turn smoothly and quietly. The outer race of each bearing should fit tightly in the crankcase. The inner race should be firm with minimal side to side movement and no detectable up and down movement.

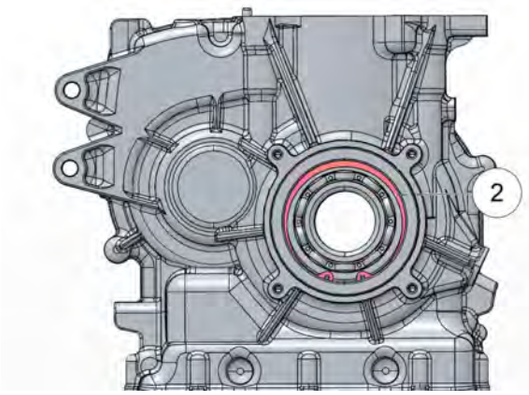
Bearings are stressed during the removal process and must not be re-used!

Bearing Removal

1. Remove and discard the PTO side crankshaft seal (1). Replace with new for assembly.



2. Remove the retaining ring(2).



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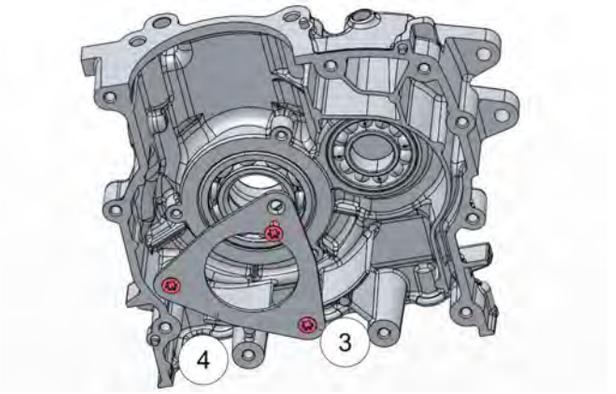
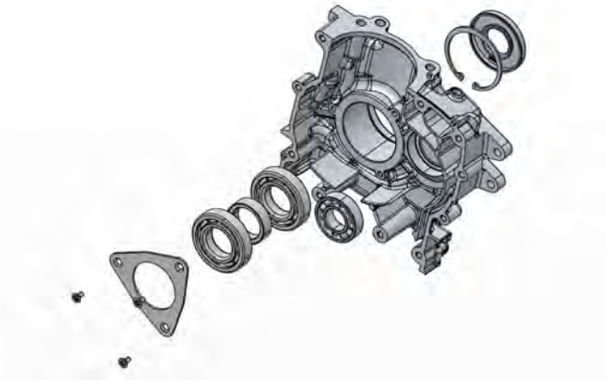
3. Remove the screws (3) that secure the bearing retainer(4) to the case.



WARNING

Do not reuse bearing retainer screws(3).

4. Support the crankcase and drive, press, or extract the bearings with a blind bearing remover.



Installation

NOTE: To ease bearing installation, warm the crankcase evenly with a heat gun or place in an oven and heat to 220-250° F. Place bearings in clean plastic wrap and set in a freezer for 10-20 minutes.

1. Clean all bearing bores and inspect for excessive wear.
2. Lubricate all bearing bores with clean engine oil.
3. Fully seat the *new* balance shaft bearing until bottomed in the bearing bore.
4. Install the retaining ring (2) for the crankshaft bearings.
5. Fully seat the *new* outer PTO crankshaft bearing until bottomed against the retaining ring.
6. Install the bearing spacer.
7. Press in the *new* inner PTO bearing until it is bottomed against the bearing spacer.
8. Install the bearing retainer and torque the *new* fastener to specification.

WARNING

Do not reuse bearing retainer screws(3).

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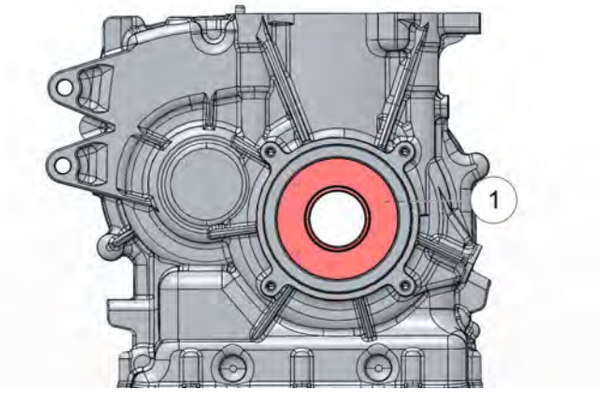
Bearing Retainer Fastener:
8 ft-lbs (11 Nm)
Apply Loctite® 272™

9. Press in the *new* PTO seal until it is flush with the engine case.



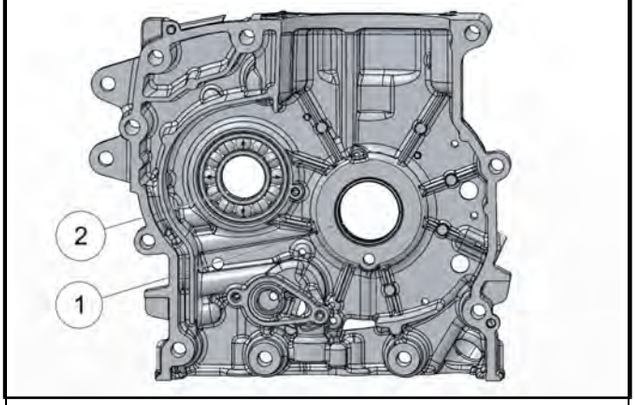
MAG Side Crankcase Bearing Service

Bearing Removal

1. Support the crankcase and drive, press, or extract the balance shaft bearing (2) with a blind bearing remover.

WARNING

The MAG side crankshaft plain bearing(1) is not serviceable. Crankcase replacement is required if the bearing is damaged or has excessive wear. The crankshaft is reusable if it meets specifications and MAG side bearing surface is not groved, pitted, damaged or excessively worn.



Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. Look for signs of discoloration, scoring or galling. Turn the inner race of each bearing. The bearings should turn smoothly and quietly. The outer race of each bearing should fit tightly in the crankcase. The inner race should be firm with minimal side to side movement and no detectable up and down movement.

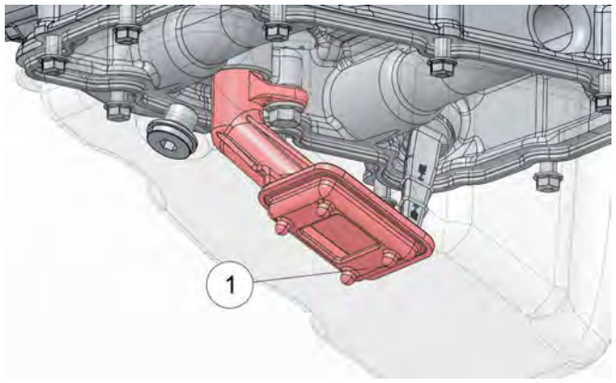
Bearings are stressed during the removal process and must not be re-used!

Installation

2. Clean all bearing bores and inspect for excessive wear.
3. Lubricate all bearing bores with clean engine oil.
4. Fully seat the *new* balance shaft bearing until bottomed in the bearing bore.

Oil Pickup Assembly Inspection

The oil pickup assembly is located inside of the oil pan.



1. Remove fastener that retains oil pickup.
2. Pull and twist to remove the oil pickup assembly from the crankcase.
3. Inspect the assembly for cracks and excessive wear. Replace if necessary.
4. Thoroughly clean the pickup assembly.
5. Press the pickup assembly into the crankcase until fully seated in bore.
6. Install fastener that retains the oil pickup; torque to specification.

WARNING

Do Not Exceed Torque Value.

= T

Oil Pickup:
59.75 in-lbs ± 6 in-lbs (6.75 Nm ± 0.7 Nm)

Oil Pressure Regulator (Bypass) Valve Inspection

The oil pressure regulator (bypass) valve is located in the MAG side crankcase (B).

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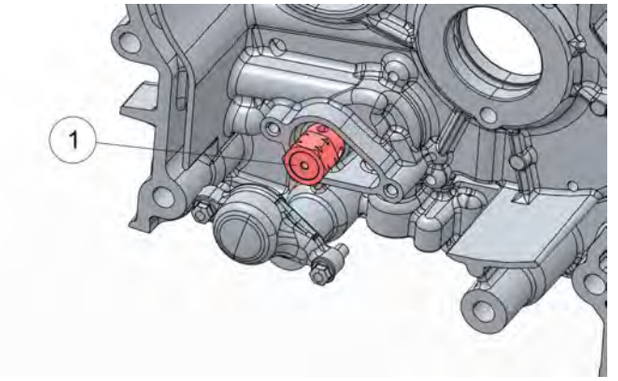

1. Remove the fasteners that retain the oil pressure regulator valve cover.
2. Unscrew the oil pressure valve (1) from the crankcase.
3. Replace the oil pressure valve if the inner plunger binds, sticks or does not operate smoothly.
4. Remove and discard the O-ring.
5. Thoroughly clean the valve.
6. Replace the O-ring and lubricate with clean engine oil.
7. Install the oil pressure valve into the crankcase; torque to specification.

= T
Oil Pressure Regulator: 20 ft-lbs ± 2 ft-lbs (27 Nm ± 3 Nm)

8. Install the oil pressure regulator valve cover; torque to specification.

= T
Oil Pressure Regulator Valve Cover: 8.8 ft-lbs ± 1.4 ft-lbs (12 Nm ± 2 Nm)

Crankcase Inspection

1. Remove all traces of gasket sealer from the crankcase mating surfaces. Inspect the surfaces closely for nicks, burrs or damage.
2. Be sure alignment pins are in place where used.
3. Be sure oil passages are clean and free of any cleaning solvent.

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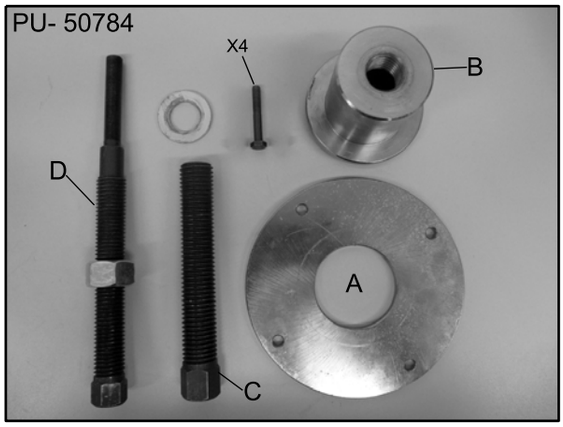
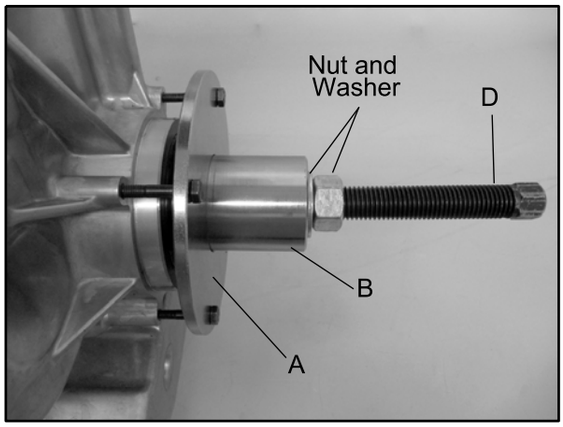
ENGINE ASSEMBLY - LOWER END

Crankcase Assembly – PTO Side

1. Lubricate all crankcase bearings with engine oil. Clean sealing surface to remove all oil sealant.
2. Place crankcase on a sturdy work bench.
3. Carefully set the PTO crankcase onto the PTO side of the crankshaft.
4. Align the connecting rod with the cylinder area of the crankcase.
5. Install the crankshaft removal / installation tool (PU-50784) on to the PTO side crankcase.
   - Install plate “A” over adapter “B”
   - Evenly attach the assembly onto the PTO side crankcase using the four bolts as shown.
   - Place the nut and large washer onto the crankshaft installation screw “D”.
   - Insert the crankshaft installation screw “D” through the threaded portion of the adaptor “B”.
   - Fully thread the crankshaft installation screw “D” into the clutch bolt threads of the crankshaft.
   - With the help of an assistant holding the crankshaft, firmly hold the crankshaft installation screw “D” with a wrench while tightening the large nut against the adaptor “B”.





6. With the help of an assistant, slowly tighten the nut until the crankshaft is completely seated into the crankcase bearings.

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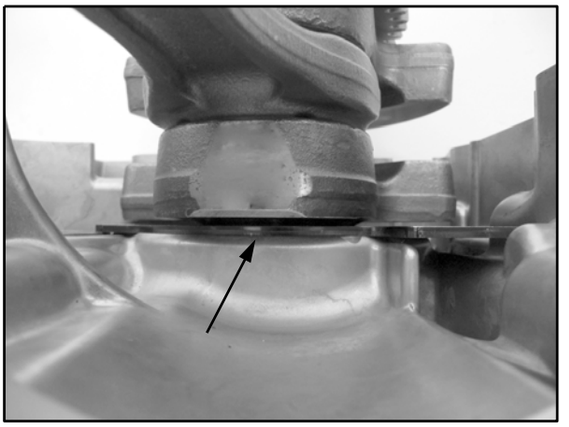
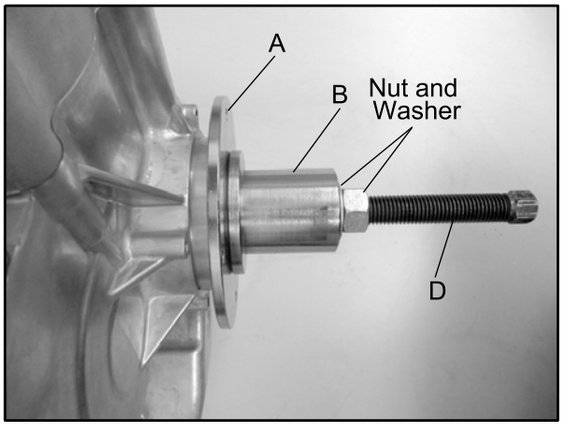
7. Remove the crankshaft removal / installation tool (PU-50784) from the crankcase.
8. Be sure crankshaft is fully seated and rotates smoothly.

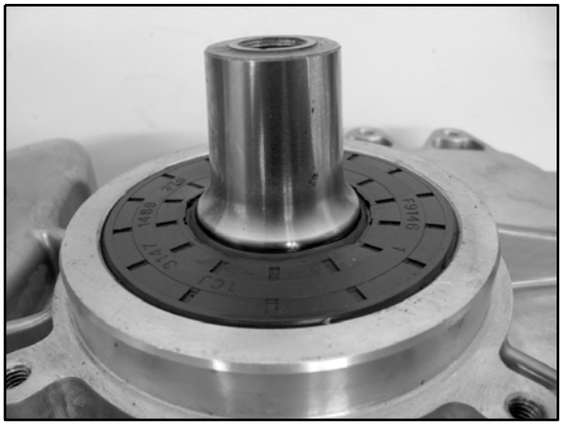


NOTE: The crankshaft seal can be replaced with the engine installed in the chassis. The engine does not have to be removed and the crankcase does not have to be separated to replace the crankshaft seal.

9. Lubricate a *new* crankshaft seal and slide it over the PTO end of the crankshaft with numbers facing OUT. Be sure seal lip does not fold back when moving over the crankshaft flange.
10. Use the crankshaft removal / installation tool (PU-50784) to properly drive the crankshaft seal into the crankcase.
    - Center plate “A” over the crankshaft so it is resting on the crankshaft seal.
    - Center adaptor “B” over the crankshaft end.
    - Place the nut and large washer onto the crankshaft installation screw “D”.
    - Insert the crankshaft installation screw “D” through the threaded portion of the adaptor “B”.
    - Fully thread the crankshaft installation screw “D” into the clutch bolt threads of the crankshaft.
    - Firmly hold the crankshaft installation screw “D” with a wrench while tightening the large nut against the adaptor “B”.



11. Drive seal until flush with seal bore.



12. Turn PTO crankcase over and support with crankshaft upright.

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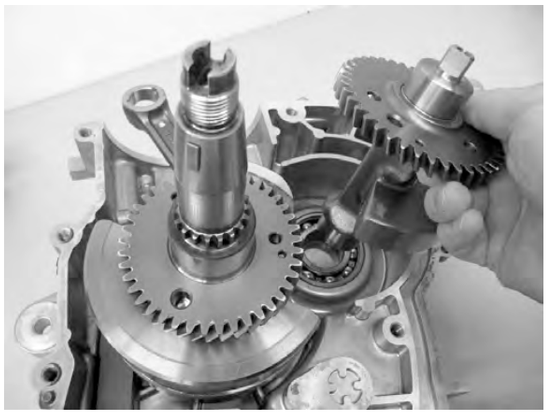
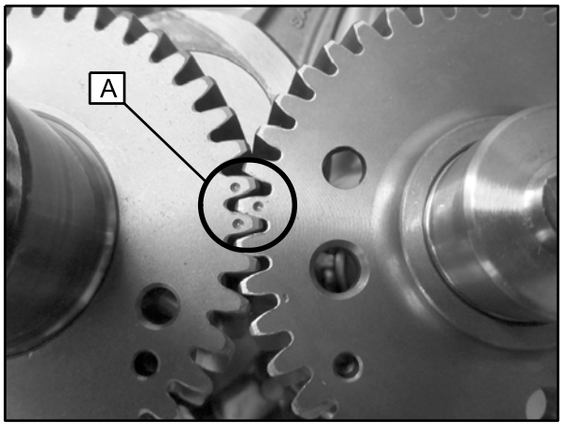
Balance Shaft Installation / Timing

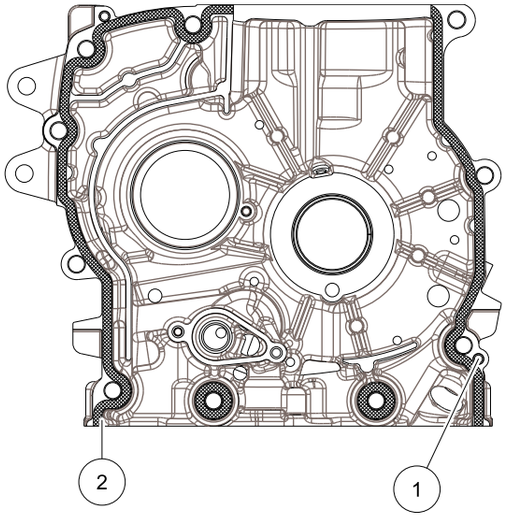
1. Position balance shaft in the crankcase.
2. Rotate crankshaft to align the timing marks (A) as shown below.
3. Fully seat the balance shaft into the crankcase and verify timing marks are correct.





Final Crankcase Assembly

1. Prepare MAG side crankcase by cleaning sealing surface. Be sure the oil pickup and oil pressure valve are fully installed.
2. Apply a thin film of Crankcase Sealant (PN 2871557) evenly to a clean and oil-free MAG crankcase mating surface as indicated below (1). Be sure alignment pins (2) are in place.



Crankcase Sealant:
PN 2871557

3. Assemble MAG crankcase to PTO crankcase immediately. Do not allow sealant to dry.
4. Tap crankcase evenly until fully seated with a soft sided hammer.
5. Install the *new* crankcase bolts finger tight in MAG side crankcase.
6. Tighten all bolts evenly until snug.

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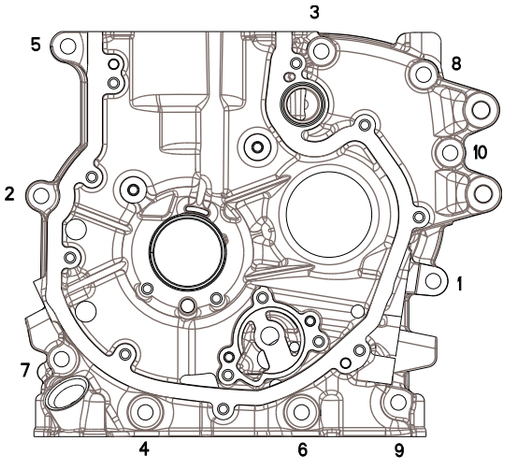
7. Torque the *new* crankcase bolts to in sequence to specification.



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Crankcase Bolts (In Sequence): **22 ft-lbs (30 Nm)**

8. Install the engine stand adapter (PU-50824–A) onto the engine ears as shown below.

9. Select the proper engine stand sleeve adapter and install it onto the engine stand adapter.
   - Sleeve adapter for a 2” bore engine stand:
   - (PU-50625)
   - Sleeve adapter for a 2.375” bore engine stand:
   - (PW-47054)
10. Place engine onto the engine stand (PU- 50624–A) for top end engine assembly as outlined in this chapter.

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TROUBLESHOOTING

Engine

Spark Plug Fouling

- Spark plug cap loose or faulty
- Incorrect spark plug heat range or gap
- PVT system calibrated incorrectly/ components worn or mis-adjusted
- Fuel quality poor (old) or octane too high
- Low compression
- Restricted exhaust
- Weak ignition (loose coil ground, faulty coil, or stator)
- Restricted air filter (main or pre-cleaner) or breather system
- Improperly assembled air intake system
- Restricted engine breather system
- Oil contaminated with fuel

Engine Turns Over But Fails To Start

- No fuel
- Dirt in fuel line or filter
- Fuel will not pass through fuel valve
- Fuel pump inoperative/restricted
- Tank vent plugged or pinched
- Engine flooded
- Low compression (high cylinder leakage)
- No spark (Spark plug fouled) ignition component failure

Engine Does Not Turn Over

- Dead battery
- Starter motor does not turn
- Engine seized, rusted, or mechanical failure

Engine Runs But Will Not Idle

- Restricted fuel supply
- Low compression
- Crankcase breather restricted

Engine Idles But Will Not Accelerate

- Spark plug fouled/weak spark
- Broken throttle cable
- Obstruction in air intake
- Air box removed (reinstall all intake components)
- Incorrect flywheel installation or sheared flywheel key.
- Restricted exhaust system
- Cam worn excessively

Engine Has Low Power

- Spark plug fouled
- Cylinder, piston, ring, or valve wear or damage (check compression)
- PVT not operating properly
- Restricted exhaust muffler
- Cam worn excessively

Piston Failure - Scoring

- Lack of lubrication
- Dirt entering engine through cracks in air filter or ducts
- Engine oil dirty or contaminated

Excessive Smoke and Carbon Buildup

- Excessive piston-to-cylinder clearance
- Worn rings, piston, or cylinder
- Worn valve guides or seals
- Restricted breather
- Air filter dirty or contaminated

Piston Failure - Scoring

- Lack of lubrication
- Dirt entering engine through cracks in air filter or ducts
- Engine oil dirty or contaminated

Slow Engine Cranking

- Weak battery
- Loose Electrical connections
- Decompression Mechanism not functioning properly.

Excessive Smoke and Carbon Buildup

- Excessive piston-to-cylinder clearance

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- Wet sumping due to over-full crankcase
- Worn rings, piston, or cylinder
- Worn valve guides or seals
- Restricted breather
- Air filter dirty or contaminated

Low Compression

- Cylinder head gasket leak
- No valve clearance (cam wear)
- Cylinder or piston worn
- Piston rings worn, leaking, broken, or sticking
- Bent valve or stuck valve
- Valve spring broken or weak
- Valve not seating properly (bent or carbon accumulated on sealing surface)
- Rocker arm sticking

Backfiring

- Fouled spark plug or incorrect plug or plug gap
- Exhaust system air leaks
- Valve sticking
- Ignition system faulty:
- Spark plug cap cracked / broken
- Ignition coil faulty
- Ignition or kill switch circuit faulty
- Poor connections in ignition system
- Ignition timing incorrect
- Sheared flywheel key

Cooling System

Overheating

- Low coolant level
- Air in cooling system
- Wrong type/mix of coolant
- Faulty pressure cap or system leaks
- Restricted system (mud or debris in radiator fins causing restriction to air flow, passages blocked in radiator, lines, pump, or water jacket, accident damage)
- Lean mixture (vents, fuel pump or fuel valve)
- Fuel pump output weak
- Electrical malfunction
- Water pump failure/ Loose impeller
- Thermistor failure
- Cooling fan inoperative or turning too slowly (perform current draw test)
- Low oil level
- Spark plug incorrect heat range
- Faulty hot light circuit
- Thermostat stuck closed or not opening completely
- Radiator is missing its internal diverter plate not allowing coolant to flow through entire radiator

Temperature Too Low

- Thermostat stuck open

Leak at Water Pump Weep Hole

- Faulty water pump mechanical seal (coolant leak)
- Faulty pump shaft oil seal (oil leak)

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CHAPTER 4
FUEL SYSTEM - GENERAL

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GENERAL INFORMATION

WARNING

* Gasoline is extremely flammable and explosive under certain conditions.

* EFI components are under high pressure. Verify system pressure has been relieved before disassembly.

* Never drain the fuel system when the engine is hot. Severe burns may result.

* Do not overfill the tank. The tank is at full capacity when the fuel reaches the bottom of the filler neck. Leave room for expansion of fuel.

* Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.

* Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.

* If you get gasoline in your eyes or if you should swallow gasoline, seek medical attention immediately.

* If you spill gasoline on your skin or clothing, immediately wash with soap and water and change clothing.

* Always stop the engine and refuel outdoors or in a well ventilated area.

Service Notes

- For more convenient and accurate testing of EFI components, it is recommended dealers utilize the Digital Wrench Diagnostic Software (dealer only), or testing may be done manually using the procedures provided.
- For the purpose of troubleshooting difficult running issues, a known-good ECU from another Sportsman 570 of the same model and year may be used without damaging system or engine components.
- Never attempt to service any fuel system component while engine is running or ignition switch is "on."
- Cleanliness is essential and must be maintained at all times when servicing or working on the EFI system. Dirt, even in small quantities, can cause significant problems.
- Do not use compressed air if the system is open. Cover any parts removed and wrap any open joints with plastic if they will remain open for any length of time. New parts should be removed from their protective packaging just prior to installation.
- Clean any connector before opening to prevent dirt from entering the system.
- Although every precaution has been taken to prevent water intrusion failure, avoid direct water or spray contact with system components.
- Do not disconnect or reconnect the wiring harness connector to the control unit or any individual components with the ignition "on." This can send a damaging voltage spike through the ECU.
- Do not allow the battery cables to touch opposing terminals. When connecting battery cables attach the positive (red) cable to positive (+) battery terminal first, followed by negative (black) cable to negative (-) battery terminal.
- Never start the engine when the cables are loose or poorly connected to the battery terminals.
- Never disconnect battery while engine is running.
- Never use a battery boost-pack to start the engine.
- Do not charge battery with key switch "on."
- Always disconnect negative (-) battery cable lead before charging battery.
- Always unplug ECU from the wire harness before performing any welding on the unit.

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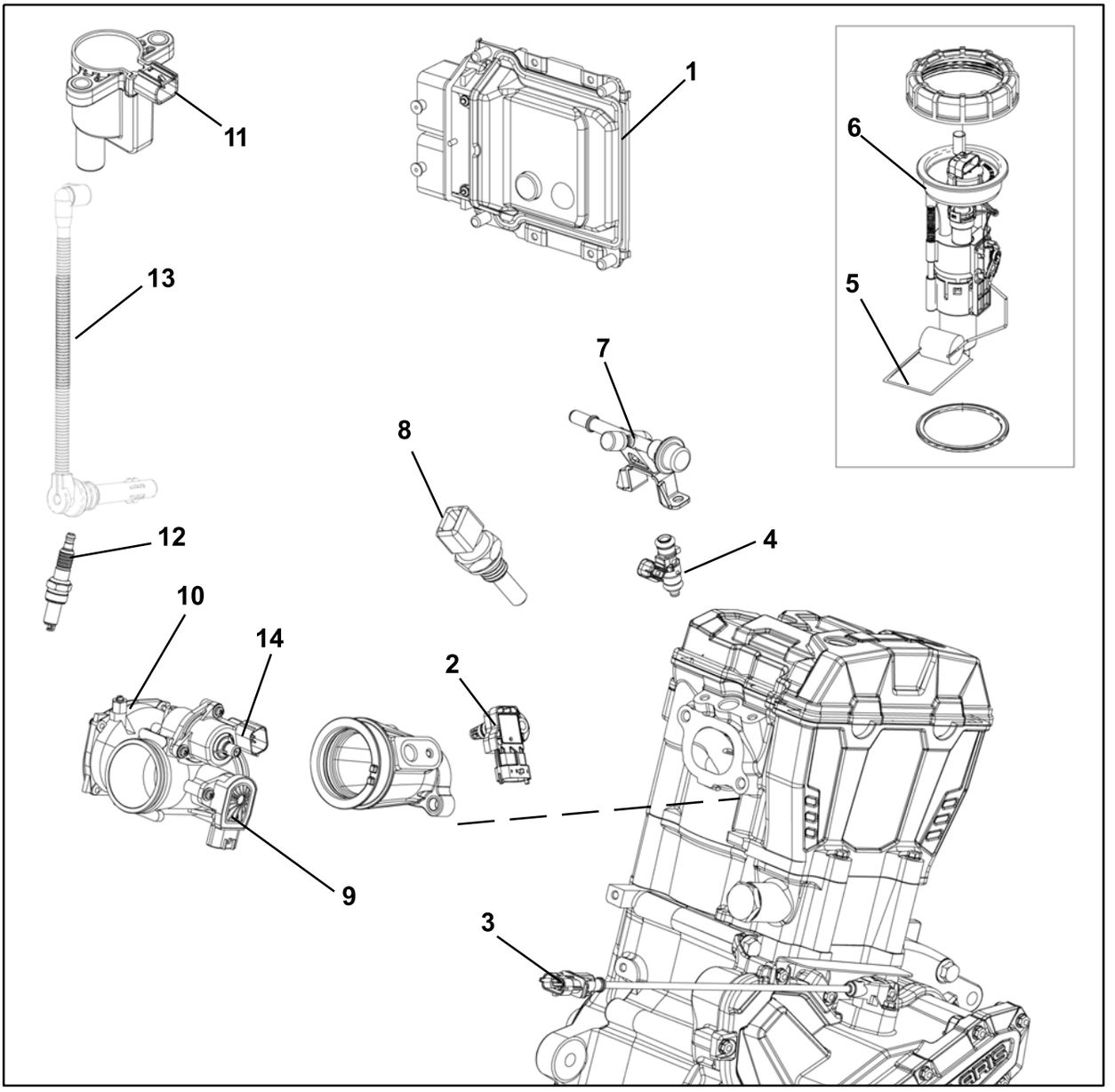
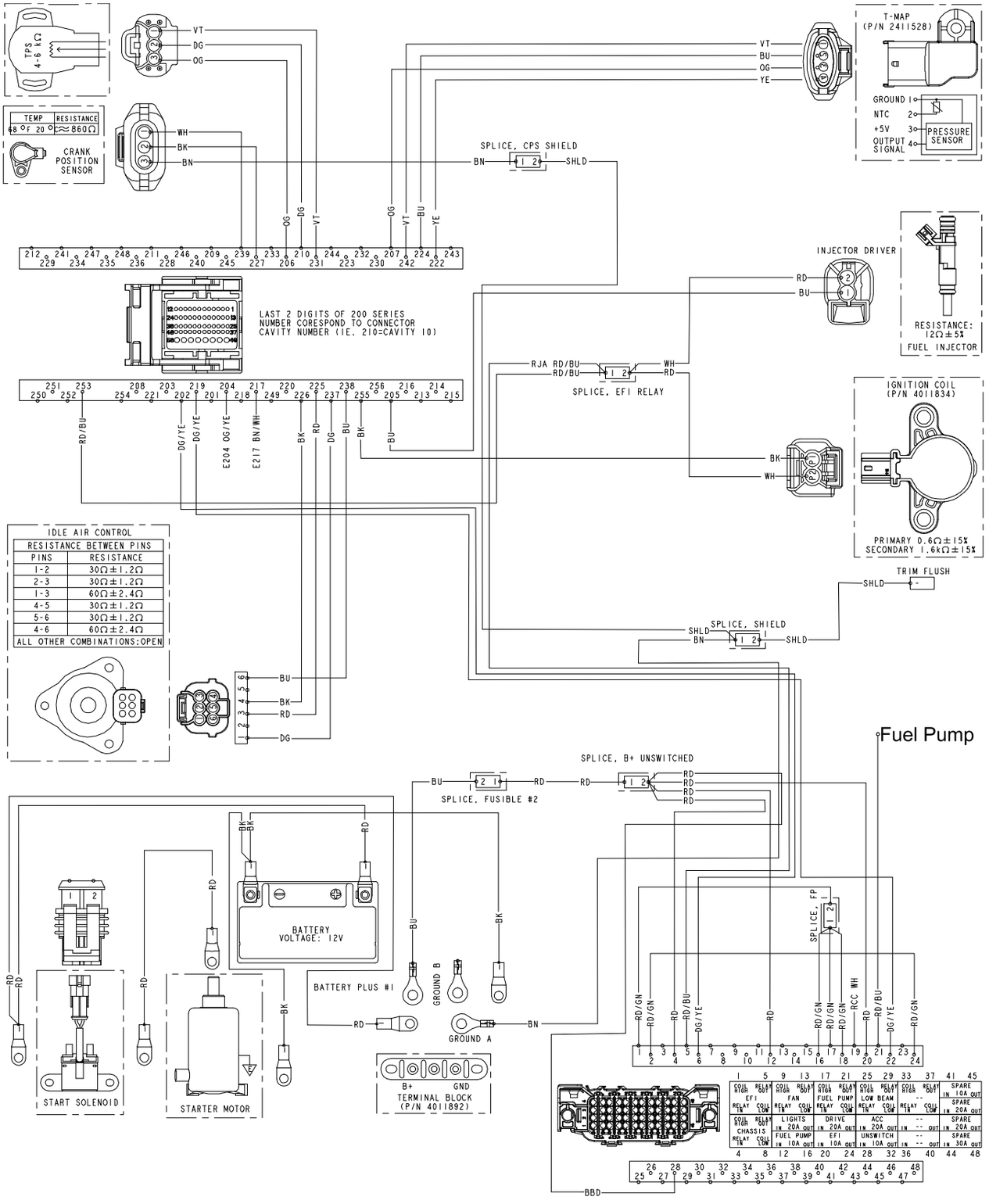
EFI System Exploded View

1. Electronic Control Unit (ECU) 2. Temperature / Manifold Absolute Pressure Sensor (T-MAP) 3. Crankshaft Position Sensor (CPS) 4. Fuel Injector 5. Fuel Filter 6. Fuel Pump / Regulator / Fuel Level Sender (located in fuel tank) 7. Fuel Rail / Regulator 8. Engine Coolant Sensor (ECT) 9. Throttle Position Sensor (TPS) 10. Throttle Body 11. Ignition Coil 12. Spark Plug	13. Spark Plug Wire 14. Idle Air Control (IAC)



Electrical Diagram

Fuel Injection-



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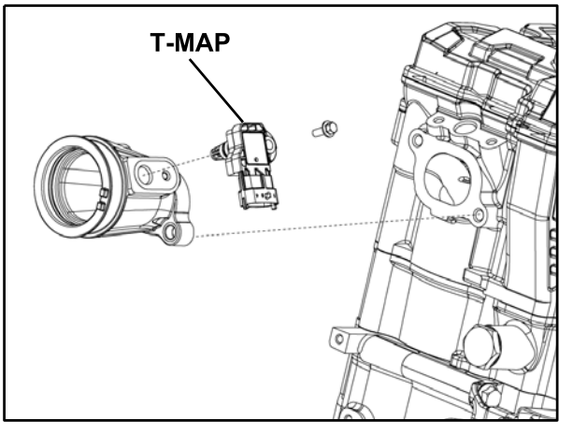
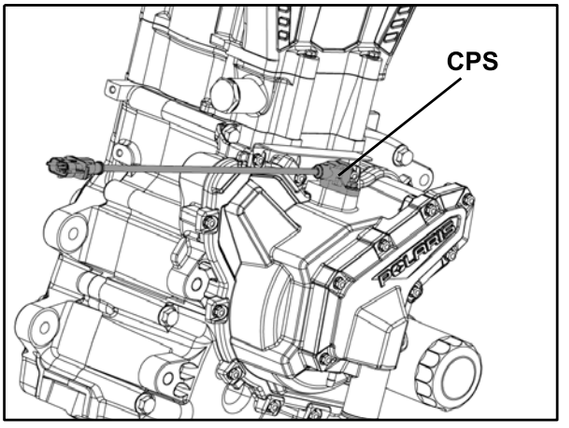
EFI System Component Locations

1. **Electronic Control Unit (ECU)** -Located under the front cover (under the front rack).

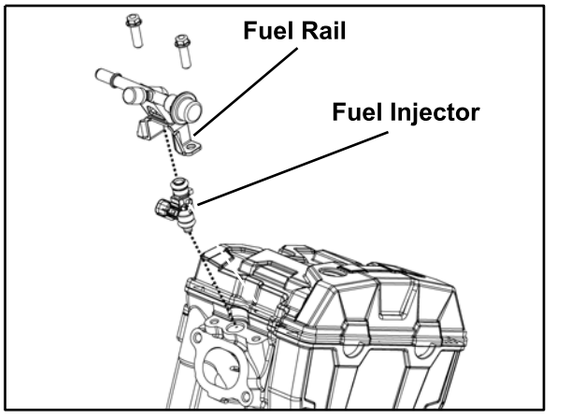
2. **Temperature and Manifold Absolute Pressure Sensor (T-MAP)**- Located in the rubber intake boot between the throttle body and the cylinder head.



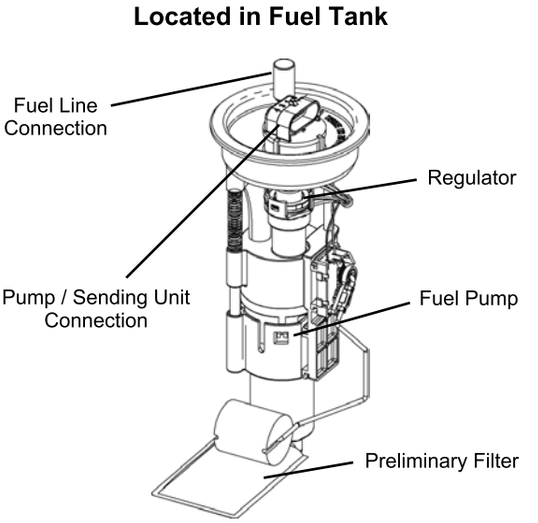
3. **Crankshaft Position Sensor (CPS)**- Located in the magneto cover on the right-hand side of the Engine.



4. **Fuel Injectors / Fuel Rail / Regulator**- Attached to the fuel rail located in the intake track of the cylinder head.



5. **Fuel Pump / Regulator / Fuel Gauge Sender Assembly**- Located in/on the fuel tank under the front cab.



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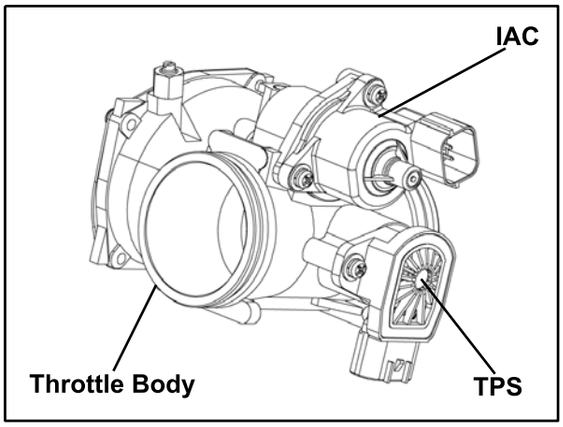
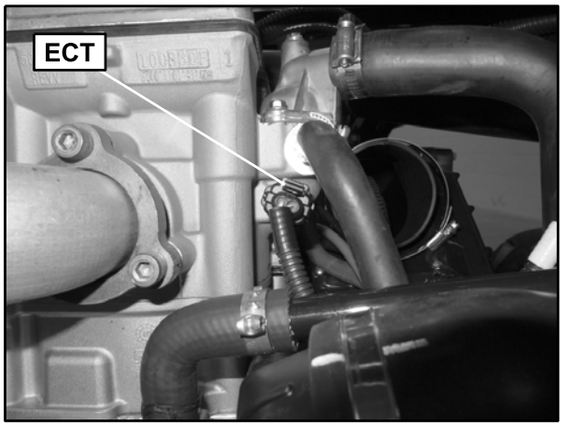
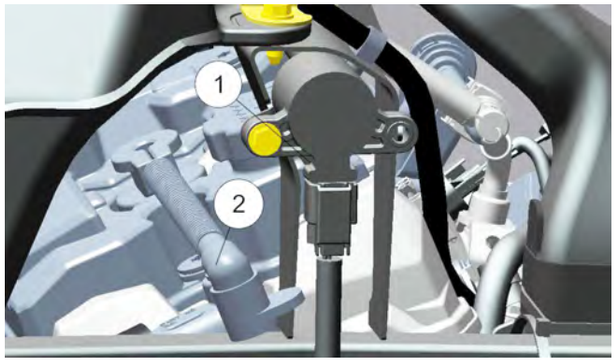
6. **Throttle Body**- Located between the rubber air box boot and rubber cylinder head adaptor under the drivers seat.



7. **Throttle Position Sensor (TPS)** -Located on the right-hand side of the throttle body below the IAC motor.
8. **Idle Air Control Motor (IAC)**- Located on the upper right-hand side of the throttle body above the TPS.
9. **Engine Coolant Temperature Sensor (ECT)**- Located in the cylinder head underneath the thermostat housing. The sensor can be accessed with the left seat, side panel, and the PVToutlet ducting removed.



10. **Ignition Coil**- located behind the left side panel.



4

Special Tools

PART NUMBER	TOOL DESCRIPTION	
PU-43506-A	Fuel Pressure Gauge Kit	
PV-48656	Fuel Pressure Gauge Adaptor	
PU-47063-B	Digital Wrench Diagnostic Software (Includes most recent version of software w/serial number, standard interface cable and SmartLink Module Kit)	
PU-47471	Digital Wrench SmartLink Module Kit (PU-47470, PU-47469, PU-47468)	
	PU-47470	Digital Wrench PC Interface Cable
	PU-47469	Digital Wrench Vehicle Interface Cable
	PU-47468	Digital Wrench SmartLink Module

Bosch Automotive Service Solutions: 1-800-328-6657 or *http://polaris.service-solutions.com /*.

Fuel Pressure Gauge Kit - PU-43506-A

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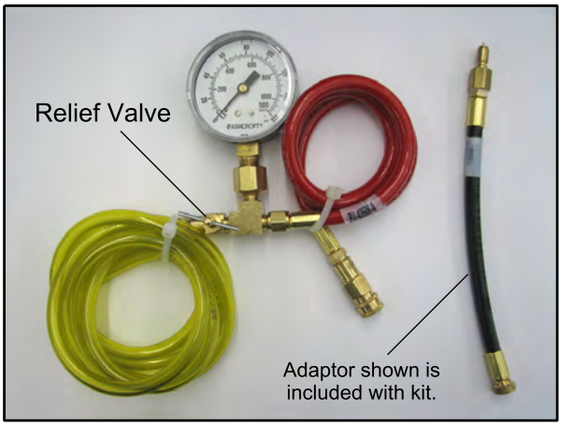
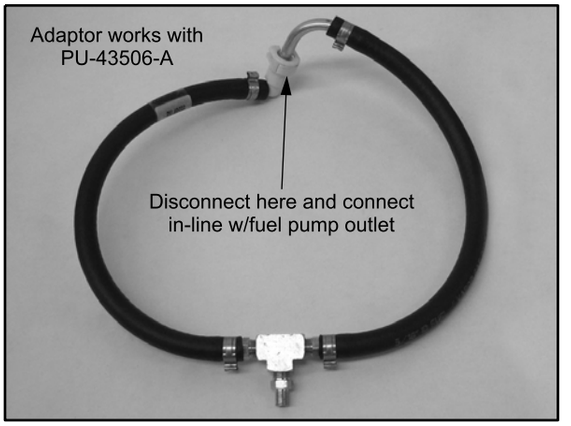
NOTE: The EFI fuel system remains under high pressure, even when the engine is not running. Before attempting to service any part of the fuel system, pressure must be relieved (if applicable). The Fuel Pressure Gauge Kit has an integrated pressure relief valve that can be used to bleed off pressure once you have completed the fuel pressure test.



Fuel Pressure Gauge Adaptor - PV-48656



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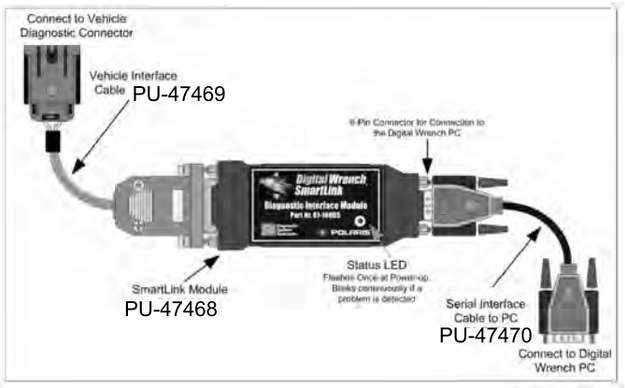
Digital Wrench Diagnostic Software - PU-47063-A

This dealer-only software installs on laptop computers equipped with a CD drive and serial port connection, and is designed to replace multiple shop tools often used to test EFI components. It also includes step-by-step diagnostic procedures to aid technician repair and troubleshooting.

NOTE: If the PC you are using is not equipped with a 9-pin serial port, a USB to serial port adaptor will be necessary. A USB to serial port adaptor can be purchased through DSA at: *www.diagsys.com*

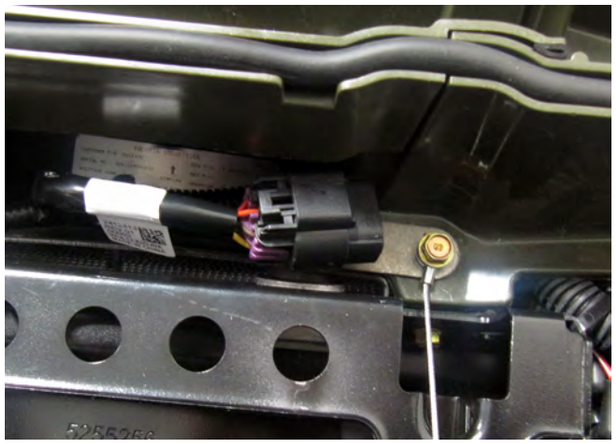
Digital Wrench SmartLink Module Kit - PU-47471

This module kit contains the necessary cables and hardware to communicate between the vehicle ECU and the Digital Wrench diagnostic software. Polaris dealers can also order the following kit components separately: **SmartLink Module PU-47468**, **Vehicle Interface Cable PU-47469** and **PC Interface Cable PU-47470**. This module kit is used on all 8 pin connector-based Polaris EFI systems. This kit is available to Polaris dealers through our tool supplier SPX at (1-800-328-6657) or *http://polaris.spx.com*



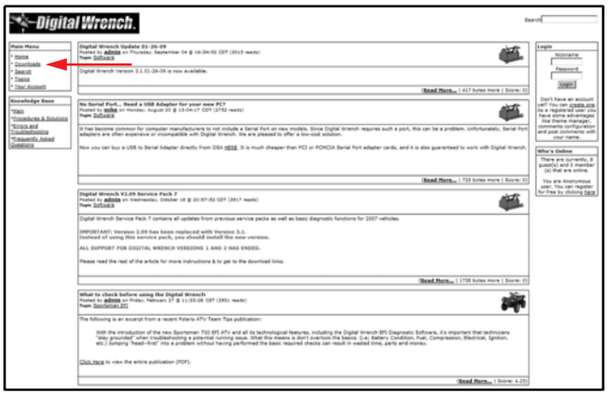
Digital Wrench - Diagnostic Connector

Located under the front rack connected to a sealed plug.

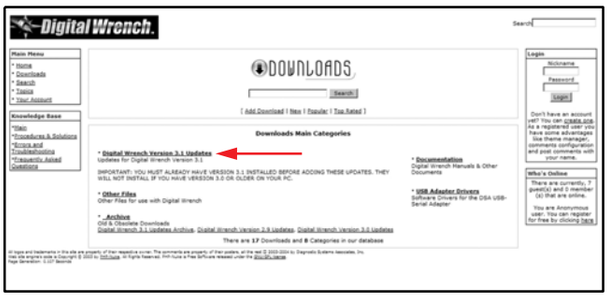


Digital Wrench - Download Website

Located at: *www.polaris.diagsys.com*



Download Digital Wrench Updates:



NOTE: For the most recent information on Digital Wrench software and update downloads please visit the website: *www.polaris.diagsys.com*

ELECTRONIC FUEL INJECTION

Principal Components

The Electronic Fuel Injection (EFI) system is a complete engine fuel and ignition management design. This system includes the following principal components:

- Fuel Pump
- Fuel Rail
- Fuel Line
- Fuel Filter(s)
- Fuel Injector
- Pressure Regulators
- Throttle Body / Intake Manifold
- Engine Control Unit (ECU)
- Ignition Coils
- Engine Coolant Temperature Sensor (ECT)
- Throttle Position Sensor (TPS)
- Crankshaft Position Sensor (CPS)
- Temperature and Manifold Absolute Pressure Sensor (T-MAP)
- Idle Air Control Motor (IAC)
- Wire Harness Assembly
- Check Engine Light

EFI Operation Overview

The EFI system is designed to provide peak engine performance with optimum fuel efficiency and lowest possible emissions. The ignition and injection functions are electronically controlled, monitored and continually corrected during operation to maintain peak performance.

The central component of the system is the Bosch Electronic Control Unit (ECU) which manages system operation, determining the best combination of fuel mixture and ignition timing for the current operating conditions.

An in-tank electric fuel pump is used to move fuel from the tank through the fuel line, to the fuel rail. The in-tank fuel pressure regulator maintains a system operating pressure and returns any excess fuel back into the tank. At the engine, fuel is fed through the fuel rail and into the injectors, which inject into the intake ports. The ECU controls the amount of fuel by varying the length of time that the injectors are "on." This range can vary depending on fuel requirements. The controlled injection of the fuel occurs every other crankshaft revolution, or once for each 4-stroke cycle. The total amount of fuel needed for one firing of a cylinder is injected during each cycle. When the intake valve opens, the fuel/air mixture is drawn into the combustion chamber, ignited and burned.

The ECU controls the amount of fuel being injected and the ignition timing by monitoring the primary sensor signals for intake air temperature, manifold absolute pressure (load), engine temperature, speed (RPM), and throttle position. These primary signals are compared to the programming in the ECU computer chip, and the ECU adjusts the fuel delivery and ignition timing to match the values.

During operation, the ECU has the ability to re-adjust temporarily; providing compensation for changes in overall engine condition and operating environment, so it will be able to maintain the ideal air/fuel ratio.

During certain operating periods such as cold starts, warm up, acceleration, etc., a richer air / fuel ratio is automatically calculated by the ECU.

Initial Priming / Starting Procedure

NOTE: The injection system must be purged of all air prior to the initial start up, and / or any time the system has been disassembled.

If the EFI system is completely empty of fuel or has been disassembled and repaired:

1. Cycle the key switch from “OFF” to “ON” 6 times, waiting for approximately 3 seconds at each “ON” cycle to allow the fuel pump to cycle and shut down.
2. Once step 1 is completed, turn the key switch to “START” until the engine starts or 5 seconds has passed.
3. If the engine failed to start, repeat step 1 for 2 more cycles and attempt to start the engine.

   If the engine fails to start, a problem may still exist, and should be diagnosed.

   NOTE: Accurate testing of EFI components is recommended utilizing the Digital Wrench Diagnostic Software (dealer only).

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ELECTRONIC CONTROL UNIT (ECU)

Operation Overview

The ECU is the brain or central processing computer of the entire EFI fuel/ignition management system. During operation, sensors continuously gather data which is relayed through the wiring harness to input circuits within the ECU. Signals to the ECU include: ignition (on/off), crankshaft position and speed (RPM), throttle position, engine coolant temperature, intake air temperature, intake manifold absolute pressure and battery voltage. The ECU compares the input signals to the programmed maps in its memory and determines the appropriate fuel and spark requirements for the immediate operating conditions. The ECU then sends output signals to set the injector duration and ignition timing.

During operation, the ECU continually performs a diagnostic check of itself, each of the sensors, and system performance. If a fault is detected, the ECU turns on the “Check Engine” light in the speedometer and stores the fault code in its fault memory. Depending on the significance or severity of the fault, normal operation may continue, or "Fail-Safe" operation (slowed speed, richer running) may be initiated. A technician can determine the cause of the “Check Engine” light by referencing the “Instrument Cluster Trouble Code Display” and “Diagnostic Trouble Code Table” or by using Digital Wrench . The ECU requires a minimum of 7.0 volts to operate. The memory in the ECU is operational the moment the battery cables are connected.

IMPORTANT: To prevent engine over-speed and possible failure, an RPM limiting feature is programmed into the ECU. If the maximum RPM limit is exceeded, the ECU suppresses the injection signals, cutting off the fuel flow and retards the ignition timing. This process repeats it self in rapid succession, limiting operation to the preset maximum.

Max RPM Limit: 7750 RPM
Idle RPM: 1200 ± 100 RPM

ECU Service

Never attempt to disassemble the ECU. It is sealed to prevent damage to internal components. Warranty is void if the case is opened or tampered with in any way.

All operating and control functions within the ECU are pre-set. No internal servicing or readjustment may be performed. If a problem is encountered, and you determine the ECU to be faulty, contact the Polaris Service Department for specific handling instructions. Do not replace the ECU without factory authorization.

The relationship between the ECU and the throttle position sensor (TPS) is very critical to proper system operation. If the TPS is faulty, or the mounting position of the TPS to the throttle body is altered, the TPS must be adjusted.

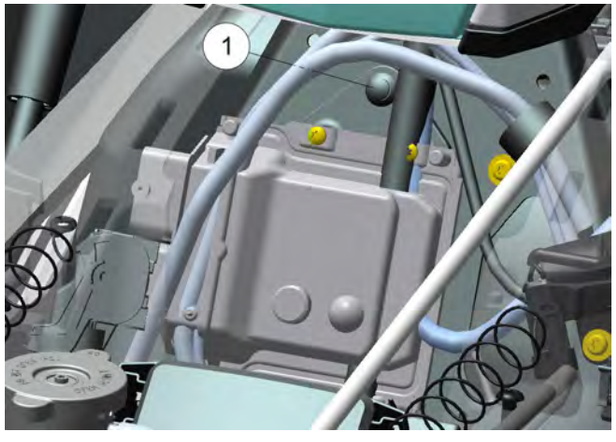
For the purpose of troubleshooting, a known-good ECU from another Polaris product of the same model may be used without system or engine component damage.

ECU Replacement

Although the need for ECU replacement is unlikely, a specific replacement procedure is required to ensure that all essential data contained within the original ECU is transferred to the replacement ECU.

NOTE: Refer to this procedure and carefully follow all instructions provided in Digital Wrench .

1. Carefully follow the ECU replacement instructions provided in Digital Wrench to ensure that all essential data contained within the original ECU is transferred to the replacement ECU.
2. Remove the front cover (fastened to the front cab under the front rack). Remove the plastic push rivet (1) that attaches the ECU to mount to the vehicle.



3. Rotate the ecu towards the front of the vehicle and lift up to free the ecu mount from the vehicle.

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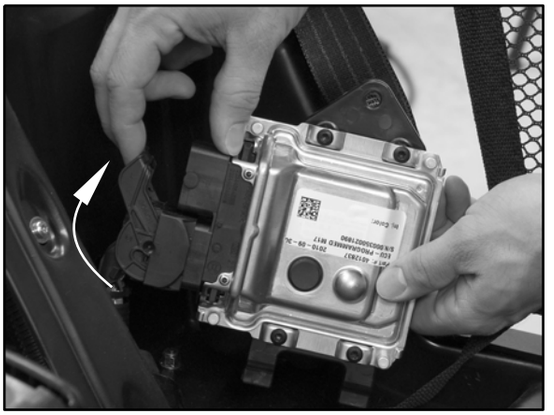
4. With the ignition turned off, disconnect the wire harness from the ECU. Lift the connector locking lever and rotate it up until the connector is free from the ECU.

   NOTE: Upon removing the ECU connector, you should hear a “click” when the connector is fully open.



5. To install, reverse the procedure and tighten any fasteners to specification.

   NOTE: Upon installing the ECU connector, you should hear a “click” when the connector is fully closed.

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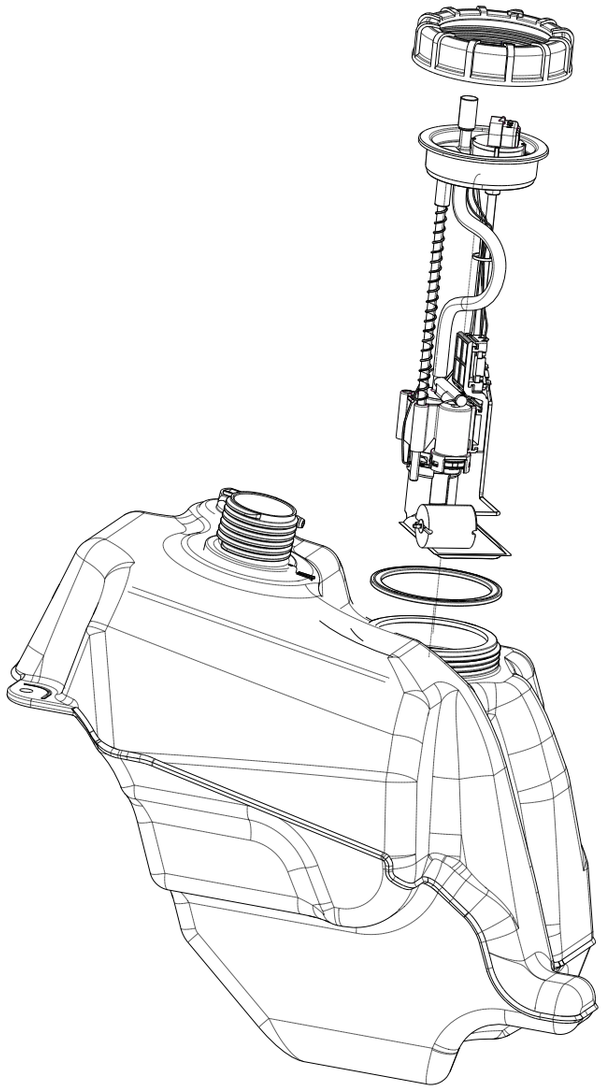
FUEL PUMP / SENDER / TANK / LINES

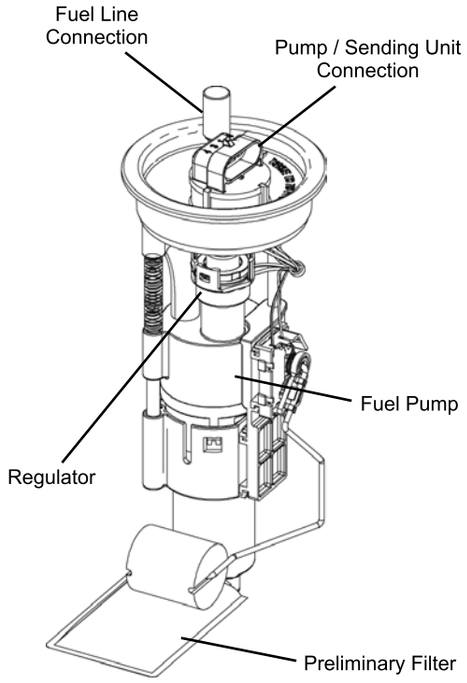
Operation Overview

An electric fuel pump assembly is used to transfer fuel to the EFI system from inside the fuel tank. This assembly includes the fuel pump, fuel filters, regulator and fuel gauge sender. The pump is rated for a minimum output of 25 liters per hour at 58 psi and has two non-serviceable fuel filters.

When the key switch is turned to "ON", the ECU activates the fuel pump, which pressurizes the system for start-up.



Located in Fuel Tank



The ECU switches off the pump preventing the continued delivery of fuel in these instances:

- If the key switch is not promptly turned to the "start" position.
- If the engine fails to start.
- If the engine is stopped with the key switch "on" (as in the case of an accident).

In these situations, the “check engine” light will go on, but will turn off after 4 cranking revolutions if system function is OK. Once the engine is running, the fuel pump remains on.

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Fuel Pump Test

If a fuel delivery problem is suspected, make certain the fuel pump filters are not plugged, that the pump is being activated through the ECU, all electrical connections are properly secured, the fuses are good, and a minimum of 7.0 volts is being supplied. If during starting the battery voltage drops below 7.0 volts, the ECU will fail to operate the system.

⚠ WARNING

Fuel is extremely flammable and may cause severe burns, injury, or death.
Do not use any device that produces a flame or electrical devices that may spark around fuel or fuel vapors.

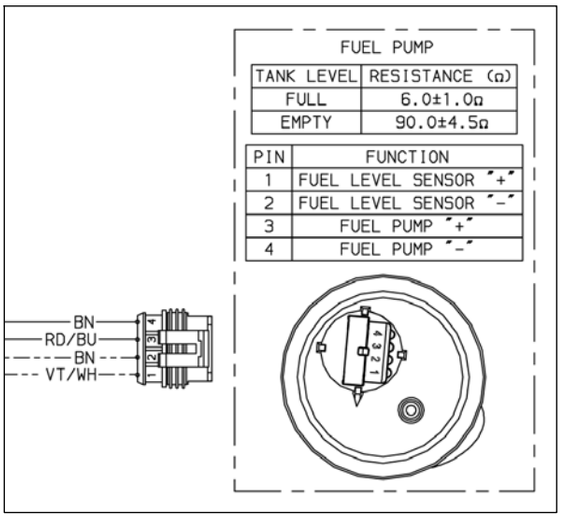
1. Remove the front cab.
2. Cover the fuel line connection at the fuel tank with a shop towel and disconnect the line from the fuel pump outlet.
3. Install the Fuel Pressure Gauge Adaptor (PV-48656) in-line between the fuel pump outlet and fuel line.
4. Connect the hose from the Fuel Pressure Gauge Kit (PU-43506-A) to the test valve on the Fuel Pressure Gauge Adaptor (PV-48656). Route the clear hose into a portable gasoline container or the vehicle's fuel tank.

5. Turn on the key switch to activate the pump and check the system pressure on the gauge. If system pressure of 58 ± 2 psi (400 ± 14 kPa) is observed, the ignition switch, ECU, fuel pump, and pressure regulator are working properly. Turn the key switch off and depress the valve button on the tester to relieve the system pressure.

Normal Fuel Pressure:
58 ± 2 psi (400 ± 14 kPa)

NOTE: If the fuel pressure is out of specification, replace the fuel pump assembly.

6. If the pump did not activate (Step 5), disconnect the harness connector from the fuel pump. Connect a DC voltmeter across terminals "3" and "4" in the plug on the vehicle fuel pump harness. Turn on the key switch and observe voltage to ensure a minimum of 7 volts is present.



NOTE: If the voltage was below 7 VDC, test the battery, ignition switch, relay (s), wiring harness and ECU.

7. If the reading is between 7 and 14 volts, turn key switch off and connect an ohmmeter between terminals "3" and "4"' at the white fuel pump connector to check for continuity within the fuel pump.

NOTE: If there was no continuity between the pump terminals, replace the fuel pump assembly.

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8. If voltage at the plug was within the specified range, and there was continuity across the pump terminals, reconnect the plug to the fuel pump, making sure you have a clean connection. Turn on the key switch and listen for the pump to activate.

   NOTE: If the pump starts, repeat steps 3, 4 and 5 to verify correct pressure.

9. If the pump still does not operate, check for correct ECU operation by plugging in a known-good ECU of the same model.

   NOTE: If the pump still does not operate, replace the fuel pump assembly.

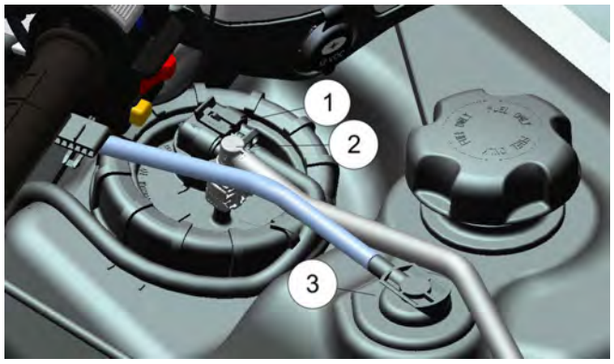
10. Re-instal the front cab.

Fuel Pump Replacement

WARNING

Always wear safety goggles when working with high pressure or flammable fluids. Failure to do so could result in serious injury or complications.

1. Remove the seat and front cab.
2. Disconnect the battery (-) negative cable.
3. Ensure that static has been discharged from you by touching a ground source such as the engine or frame.
4. Disconnect the fuel pump electrical harness(1).



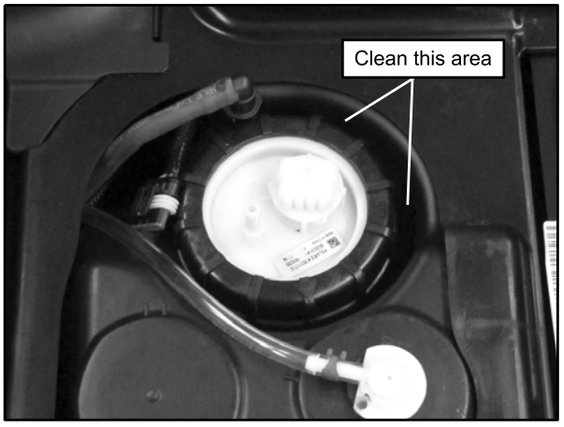
5. While holding a shop towel over the fuel line connector, disconnect the quick connect fuel line (2) from the fuel pump.

CAUTION

It is possible for pressurized fuel to be present when disconnecting the fuel line.
It is recommended to allow the vehicle to sit for a period of one hour after shutting off the engine before servicing the fuel pump. This allows the exhaust to cool and fuel pressure to drop.

NOTE: A small amount of fuel may come out of the fuel line or tank. Properly drain fuel into a suitable container.

6. Be sure the top of the fuel tank is clean. If it requires cleaning, hand wash the top of the tank to ensure no debris will enter the fuel system when the fuel pump is removed.



WARNING

Failure to clean area around fuel pump may lead to debris entering the fuel tank during service. Excessive debris in fuel tank may cause premature wear of fuel pump and/or clogging
of internal fuel filters.

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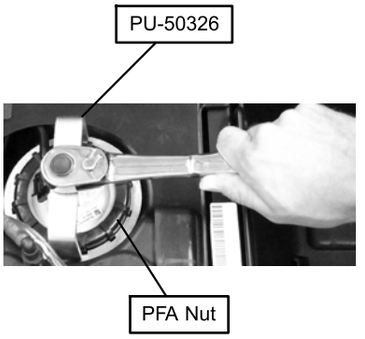
7. Place the Fuel Pump Service Tool (PU-50326) over the fuel pump PFA nut. Using a 1/2” drive ratchet or breaker bar, loosen and remove the PFA nut. Discard the PFA nut.



NOTE: Apply downward force on the fuel pump flange while removing the fuel pump PFA nut.

8. Carefully lift the fuel pump out of the fuel tank. As the fuel pump assembly is being removed, be aware of float arm and pump pre-filter. Hold the float arm to the pump body as you lift and tilt the pump to ensure that the float arm is not bent when removed from the tank.

9. Transfer old fuel pump to a suitable container capable of safely holding fuel. The fuel pump will retain some fuel.
10. Inspect the inside of the fuel tank for debris (may require flashlight and mirror). If debris like mud or sand is present, fuel tank should be flushed and cleaned out prior to installation of new fuel pump assembly.

    NOTE: It is recommended to remove the fuel tank from the vehicle and rinse it with a small amount of clean fuel. Do not use water or any other chemicals to remove debris.

11. Remove new fuel pump assembly, gasket and PFA nut from packaging. Use care not to bend float arm during un-packaging. Do not lift or carry fuel pump assembly by the float arm.

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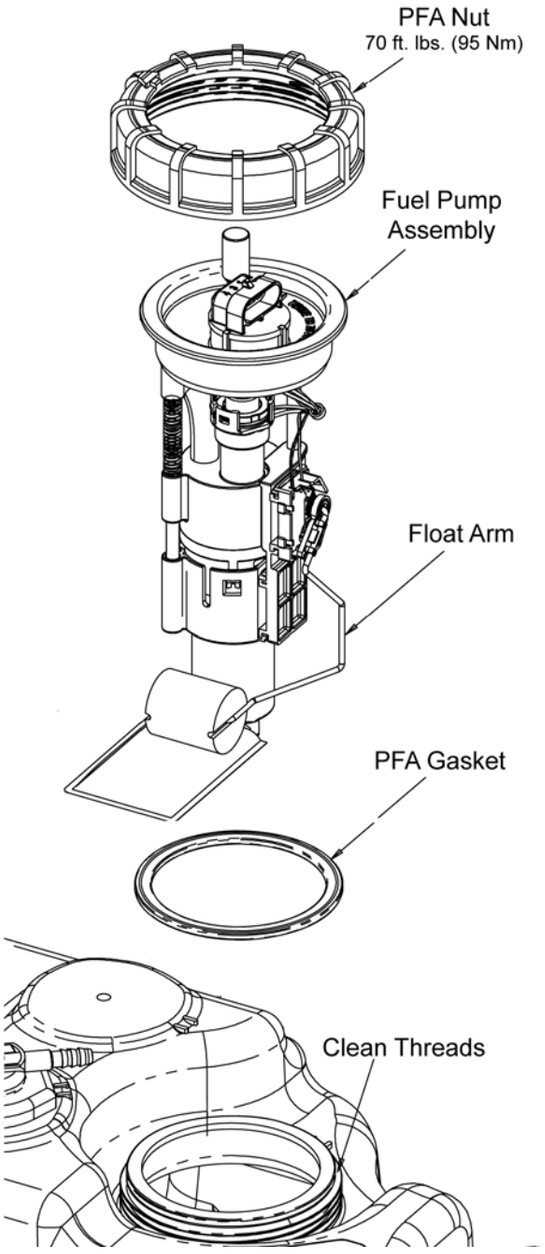
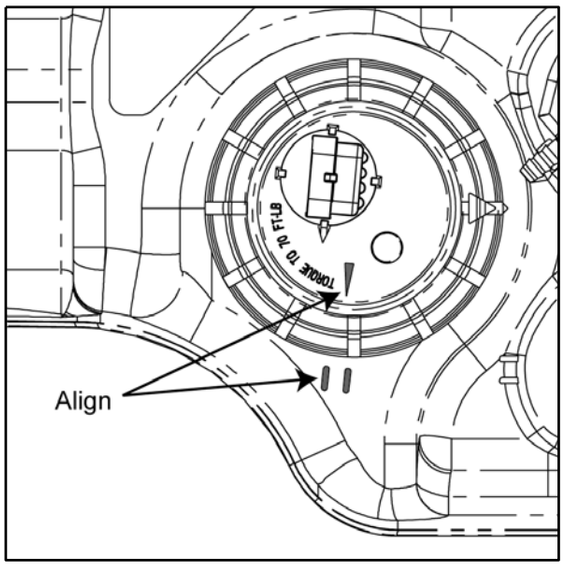
12. Use cleaning wipes provided to clean fuel tank surface and threads. Remove all debris, grease and oil. Allow surfaces to dry completely.
13. Install new PFA gasket onto fuel pump assembly using care not to damage gasket or bend float arm.



14. Install fuel pump into fuel tank, hold float arm to the pump body and tilt assembly to ensure float arm does not get caught or bent during installation.
15. Gently push down on fuel pump flange ensuring flange is centered.
16. Roughly align orientation mark on fuel pump between the orientation marks on fuel tank to ensure float arm does not get bent or snagged.



WARNING

Failure to align the orientation marks may lead to interferences with the fuel level float arm and cause incorrect function.

17. While maintaining downward pressure, thread new PFA nut onto fuel tank and hand tighten. Use care when starting PFA nut, ensuring threads are properly aligned. Verify orientation marks are still aligned between fuel pump and fuel tank.

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18. Torque PFA nut to specification using the Fuel Pump Service Tool (PU-50326) and a calibrated torque wrench.

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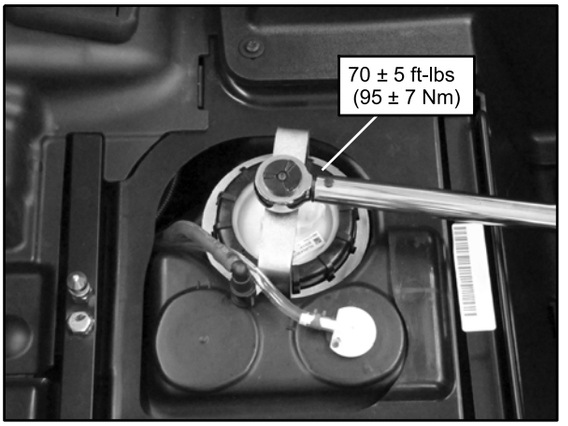
Fuel Pump PFA Nut: 70 ± 5 ft-lbs (95 ± 7 Nm)



19. Verify alignment of fuel pump and tank orientation marks.
20. Connect the fuel line to the fuel pump outlet.

    NOTE: Be sure to engage the retainer on fuel line until it snaps into place. Pull on fuel line lightly to confirm connection.

21. Connect the fuel pump electrical harness.
22. Connect battery.
23. Install the driver and passenger seat.
24. Test the fuel pump by turning on the key and listening for the pump to activate. Cycle the key several times to prime the system.

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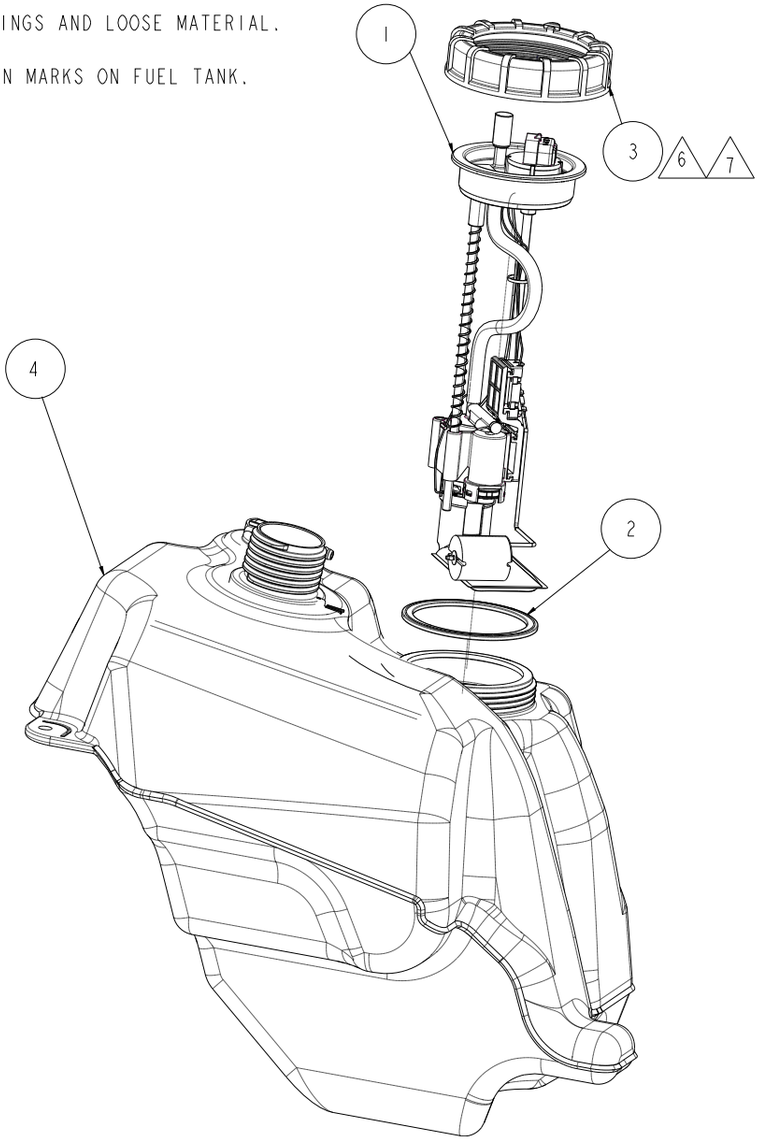
Fuel Tank Exploded View

NOTES:

4. ASSEMBLY INTERIOR TO BE FREE OF ALL SHAVINGS AND LOOSE MATERIAL.

6 PFA ALIGNMENT MARK TO BE ORIENTED BETWEEN MARKS ON FUEL TANK.

7 TORQUE PFA NUT TO 70 FT-LB +/- 5 FT-LB.



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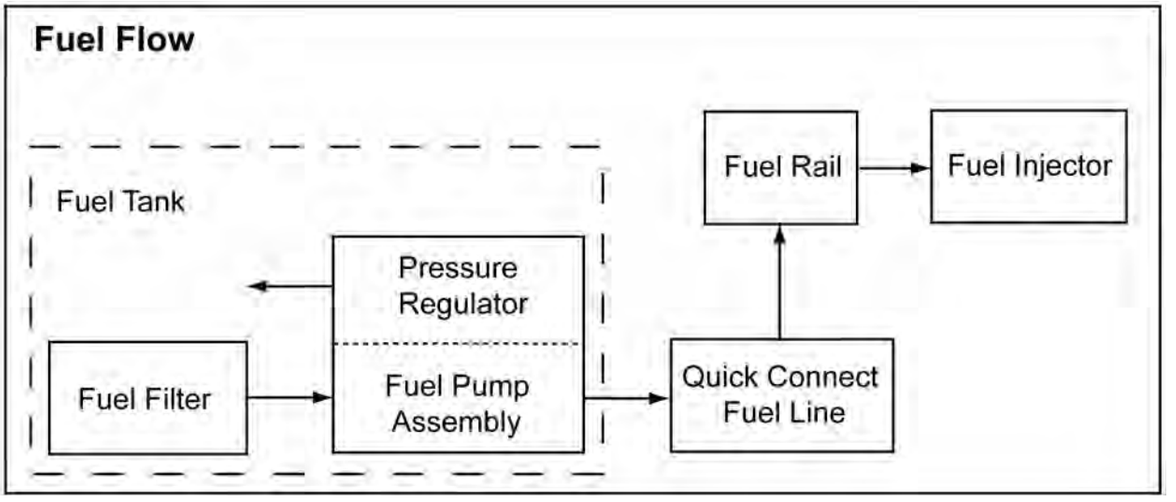
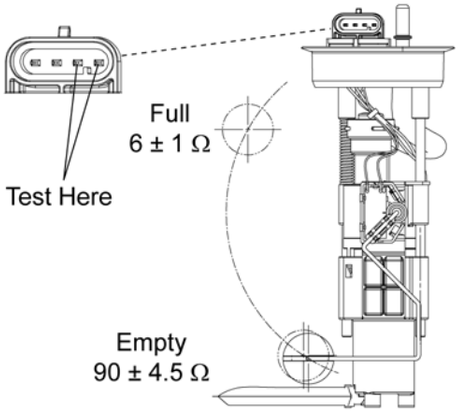


Fuel Sender Test

If the fuel gauge reading on the instrument cluster is not working, or if the display reading differs in large comparison to the fuel in the tank, perform a resistance test on the fuel sender.

Disconnect the fuel pump / sending unit connection and measure the resistance. If out of specification, replace the fuel pump assembly.



Fuel Sender Resistance Specifications:
Full: 6 ± 1 Ω
Empty: 90 ± 4.5 Ω

Fuel Tank Removal

NOTE: Syphon as much fuel from the tank as possible before attempting to remove it from the vehicle.

⚠ WARNING

Always wear safety goggles when working with high pressure or flammable fluids. Failure to do so could result in serious injury or complications.

1. Remove the seat, side panels, air box top, PVT exhaust duct and front cab .
2. Disconnect the negative battery cable.
3. Disconnect the fuel pump electrical harness(1).

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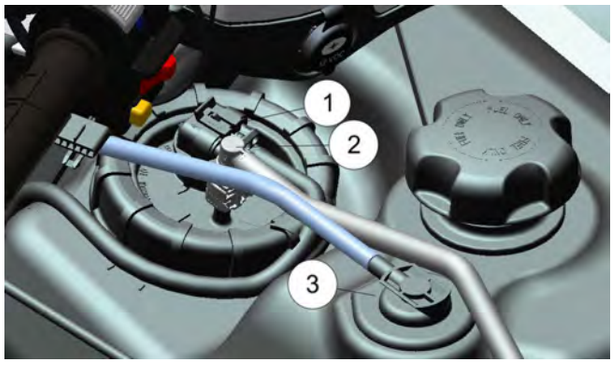
4. While holding a shop towel over the fuel line connector, disconnect the quick connect fuel line (2) from the fuel pump. Move the fuel line out of the way for tank removal.



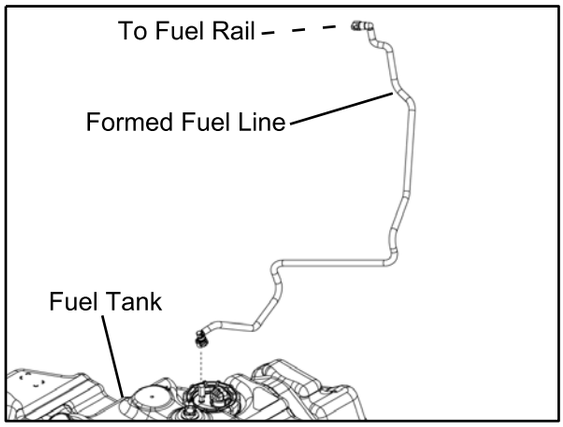
NOTE: A small amount of fuel may come out of the fuel line or tank. Properly drain fuel into a suitable container.

5. Remove the fuel tank vent hose clamp (3) with a suitable pliers and remove the vent line from the tank vent fitting.
6. Remove the two fuel tank mounting bolts at the rear of the gas tank.
7. Carefully pull the fuel tank out of the frame. Keep the fuel tank horizontal during removal, this will keep the fuel in the tank from spilling out the top inlet.

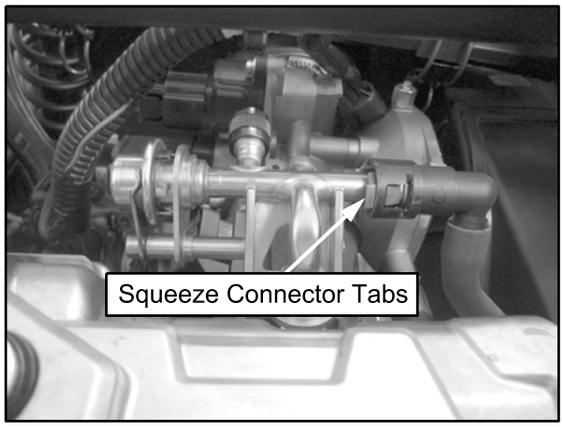
Fuel Tank Installation

1. Carefully reinstall the fuel tank assembly.
2. Reinstall the fuel tank brackets and fasteners.
3. Install the fuel line, vent hose and clamp. Verify they are secure.
4. Reconnect the fuel pump electrical harness.
5. Reconnect the negative battery cable. Test the fuel pump by turning the ignition key on and listening for the pump to activate. Check for leaks.
6. Reinstall the PVT exhaust duct, air box top, front cab, side panels and seat.

Fuel Lines - Quick Connect



1. Place a shop towel around the fuel line to catch any dripping fuel. Squeeze the connector tabs together and push the locking slide back.



2. Pull on the fuel line for removal.
3. To install the line(s), verify the connections are clean and free of debris.
4. Snap the fuel line back over the nipple and slide the locking mechanism back into place. Verify the connector tabs snap back into place.

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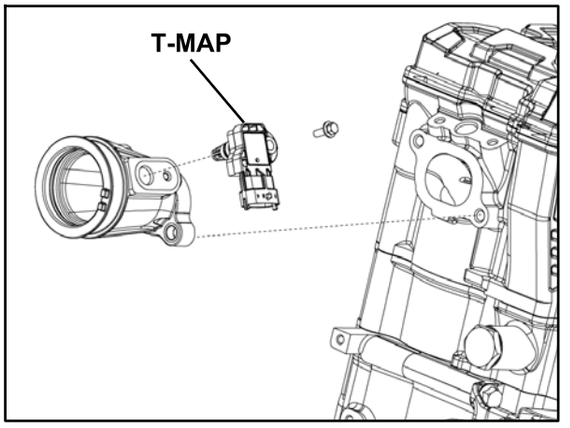
TEMP / MANIFOLD ABSOLUTE PRESSURE SENSOR (T-MAP)

Operation Overview

Mounted on the throttle body intake manifold, the T-MAP sensor performs two functions in one unit.



Air passing through the intake is measured by the T-MAP and relayed to the ECU. These signals, comprised of separate air temperature and manifold absolute pressure readings, are processed by the ECU and compared to its programming for determining the fuel and ignition requirements during operation. The T-MAP sensor provides the ECU with engine load data.

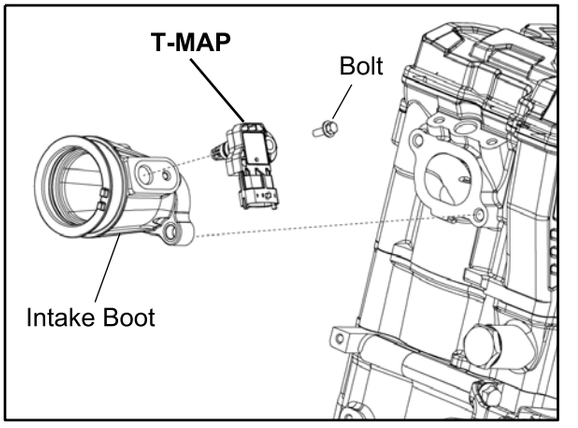
T-MAP Sensor Test

The T-MAP sensor is a non-serviceable item. If it is faulty, it must be replaced.

NOTE: This sensor should only be tested using the Digital Wrench Diagnostic Software (dealer only).

T-MAP Sensor Replacement

1. Disconnect the negative (-) battery cable.
2. Remove the right side panel.
3. Disconnect vehicle harness from T-MAP sensor.
4. Remove the retaining bolt and remove the sensor from the intake boot.
5. Use a light coating of soapy water on the grommet to aid installation of the new sensor.
6. Install the sensor by inserting it with a twisting motion to properly seat the grommet.



7. Install the retaining bolt and torque to specification.

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T-MAP Retaining Bolt: **24 in-lbs (2.8 Nm)**

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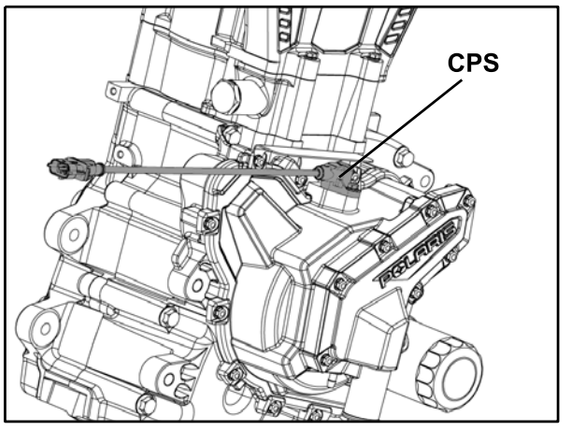
CRANKSHAFT POSITION SENSOR (CPS)

Operation Overview

Mounted on top of the stator cover, the crankshaft position sensor is essential to engine operation, constantly monitoring the rotational speed (RPM) and position of the crankshaft.



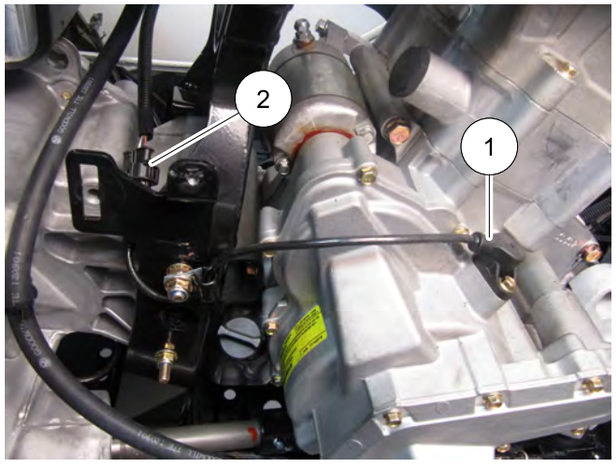
A ferromagnetic 35-tooth encoder ring with a missing tooth is built onto the flywheel. The inductive speed sensor is mounted 1.0 ± 0.26 mm (0.059 ± 0.010 in.) away from the encoder ring. During rotation, an AC pulse is created within the sensor for each passing tooth. The ECU calculates engine speed from the time interval between the consecutive pulses.

The encoder ring missing tooth creates an “interrupt” input signal, corresponding to specific crankshaft position. This signal serves as a reference for the control of ignition timing by the ECU. Synchronization of the CPS and crankshaft position takes place during the first two revolutions each time the engine is started. This sensor must be properly connected at all times. If the sensor fails or becomes disconnected for any reason, the engine will stop running.

CPS Test

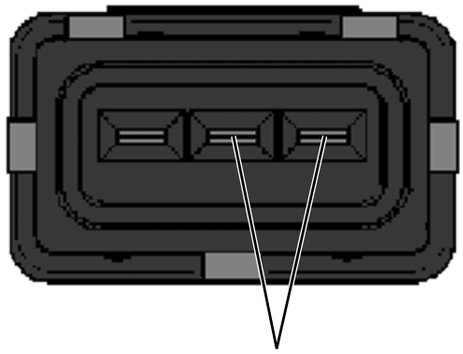
The CPS is a sealed, non-serviceable assembly. If fault code diagnosis indicates a problem with this sensor, test as follows:

1. To acess the CPS sensor (1), remove the right side panel and footwell.
2. Disconnect CPS harness connector(2).



3. Connect an ohmmeter between the CPS pin terminals shown below. A resistance value of **1000 Ω ± 10%** at room temperature should be obtained.

CPS Connector



1000 ohms ± 10%

CPS Resistance Specification:
1000 Ω ± 10%

4. If the resistance is correct:
   - Test the main harness circuit between the sensor connector terminals and the corresponding pin terminals at the ECU (see wiring diagram).
   - Check the sensor mounting, air gap, flywheel encoder ring for damage or runout, and flywheel key. Follow the “CPS Replacement” procedure to inspect CPS and flywheel encoder ring for damage.
5. If the resistance is incorrect, follow the “CPS Replacement” procedure.

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CPS Replacement

1. If not done already; disconnect the CPS harness connector (see “CPS Test”).
2. Using an 8mm socket, remove the CPS retaining bolt and remove the sensor from the stator cover.
3. Install new sensor using a light coating of oil on the O-ring to aid installation.
4. Torque the CPS and heat shield retaining bolts (if equipped) to specification.

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CPS Retaining Bolt: **9 ft-lbs (12 Nm)**

5. Re-install the right side footwell and side panel.

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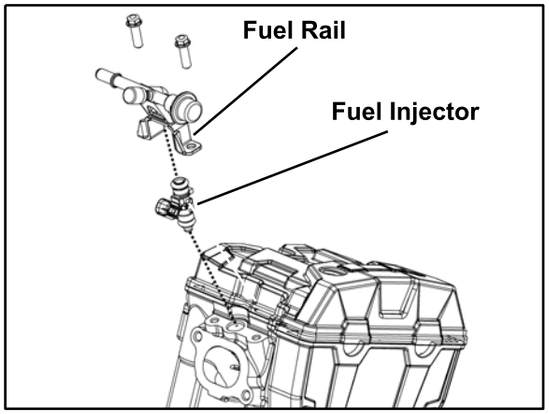
FUEL INJECTORS

Operation Overview

The fuel injector is mounted into the cylinder head, with the fuel rail retaining it from the top end. O-rings on both ends of the injector prevent external fuel leaks and also insulate the injectors from heat and vibration.



When the key switch is on, the fuel rail is pressurized, and the EFI relay provides voltage to the injectors. During engine operation, the ECU completes the ground circuit, energizing the injectors. The valve needle in each injector is opened electromagnetically, and the pressure in the fuel rail forces fuel down through the inside. The “director plate” at the tip of the injector contains a series of calibrated openings which directs the fuel into the intake port in a cone-shaped spray pattern.

The amount of fuel injected is controlled by the ECU and determined by the length of time the valve needle is held open, also referred to as the “injection duration” or “pulse width”. It may vary in length depending on the speed and load requirements of the engine.

Fuel Injector Troubleshooting

Injector problems typically fall into three general categories- electrical, dirty / clogged, or leakage. An electrical problem usually causes one or both of the injectors to stop functioning. Several methods may be used to check if the injectors are operating.

- With the engine running at idle, feel for operational vibration, indicating that they are opening and closing.
- When temperatures prohibit touching, listen for a buzzing or clicking sound with a screwdriver or mechanic's stethoscope.
- Disconnect the electrical connector from an injector and listen for a change in idle performance (only running on one cylinder) or a change in injector noise or vibration.

  NOTE: Do not apply voltage directly to the fuel injector. Excessive voltage will burn out the injector. Do not ground the injector with the ignition on. Injector(s) will open/turn on if relay is energized.

If an injector is not operating, it can indicate either a bad injector, or a wiring/electrical connection problem. Check as follows:

Injector leakage is very unlikely, but in rare instances it can be internal (past the tip of the valve needle), or external (weeping around the injector body). The loss of system pressure from the leakage can cause hot restart problems and longer cranking times.

Injector problems due to dirt or clogging are unlikely due to the design of the injectors, the high fuel pressure, the use of filters and the detergent additives in the gasoline. Symptoms that could be caused by dirty/clogged injectors include rough idle, hesitation/stumble during acceleration, or triggering of fault codes related to fuel delivery. Injector clogging is usually caused by a buildup of deposits on the director plate, restricting the flow of fuel, resulting in a poor spray pattern. Some contributing factors to injector clogging include; dirty air filters, higher than normal operating temperatures, short operating intervals and dirty, incorrect, or poor quality fuel. Cleaning of clogged injectors is not recommended; they should be replaced. Additives and higher grades of fuel can be used as a preventative measure if clogging has been a problem.

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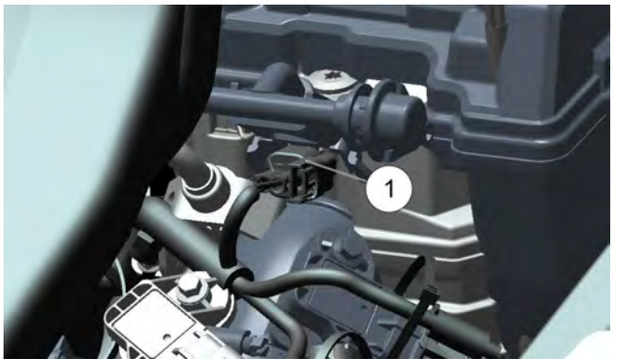
Fuel Injector Test

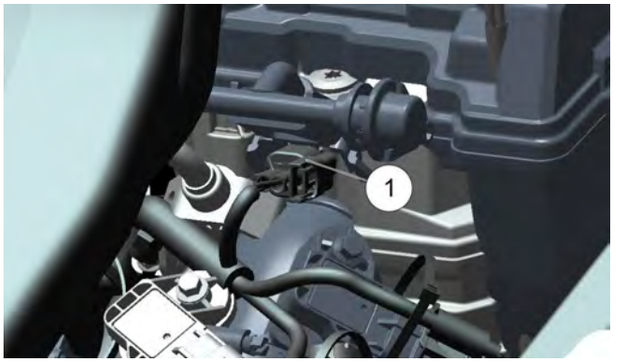
The fuel injector is non-serviceable. If diagnosis indicates a problem with the injector, remove the fuel injector connector (1) and test the resistance of the fuel injector by measuring between the two pin terminals:



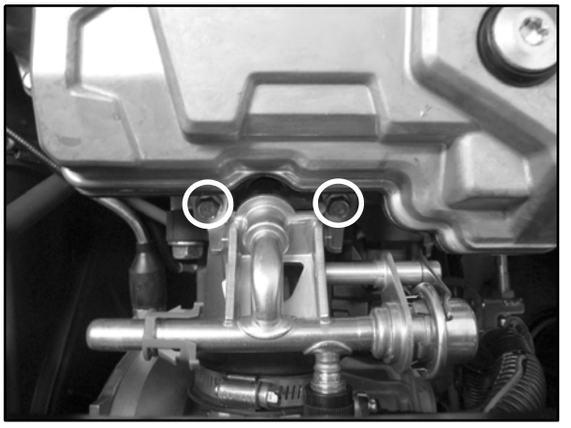
Fuel Injector Resistance Specification:
11.4 - 12.6 Ω

Fuel Injector Replacement

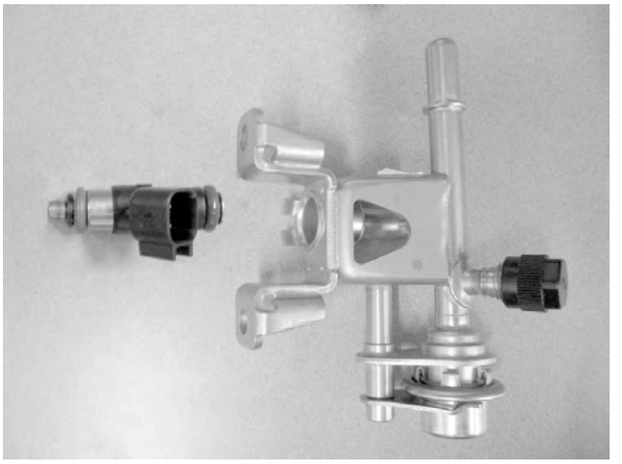
1. Remove the seat, air box, PVT ducting, right and left side panels.
2. Be sure the engine has cooled enough to work on.
3. Disconnect the negative battery cable.
4. Thoroughly clean the fuel injector area if all dirt and debris.
5. Disconnect the fuel injector harness lead.



6. Hold a shop towel over the fuel line fittings and remove the fuel supply line from the fuel rail.
7. Remove the (2) screws that mount the fuel rail to the cylinder head.



8. Carefully pull up on the fuel rail and injector to remove them from the engine as an assembly. If the injector stays in the cylinder head, grab the injector with your fingers and gently pull and twist the injector unit it can be removed from the cylinder head. Take care not to damage the fuel injector ends during removal.
9. Gently pull and twist to free the injector from the fuel rail.



10. Upon installation of the new fuel injector, lightly lubricate the injector O-rings to aid installation.

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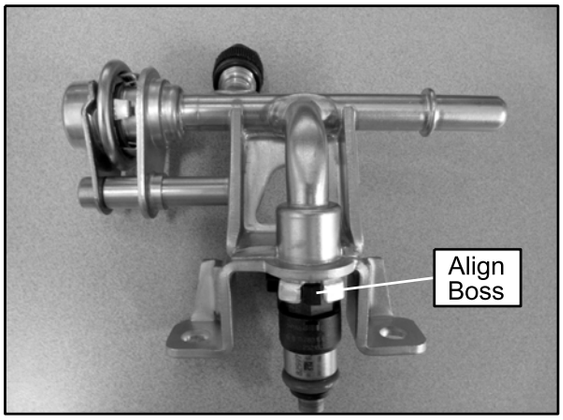
11. Install the new injector into the fuel rail. Be sure to align boss in the injector with the slot in the fuel rail.



12. Thoroughly clean the area around the fuel injector port on the cylinder head.
13. Lightly lubricate the injector O-rings and reinstall the fuel rail / injector assembly into the cylinder head.
14. Install the fuel rail mounting screws and torque to specification.

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Fuel Rail Mounting Screws: **7 ft-lbs (10 Nm)**

15. Reinstall the fuel line to the fuel rail.
16. Connect the harness lead to the fuel injector.
17. Reconnect the negative battery cable and reinstall the driver's seat.
18. Start the engine briefly and inspect the fuel rail and injector for fuel leaks.
19. Reinstall the seat, air box, PVT ducting, right and left side panels.

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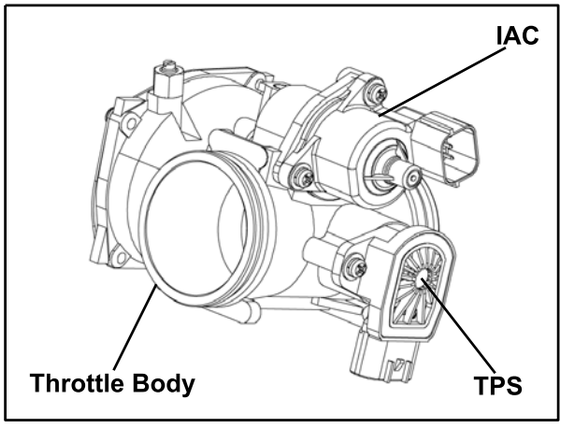
IDLE AIR CONTROL (IAC)

Operation Overview

The Idle Air Control (IAC) is used to stabilize the idle quality of the engine at cold start-up and after warm-up operations.

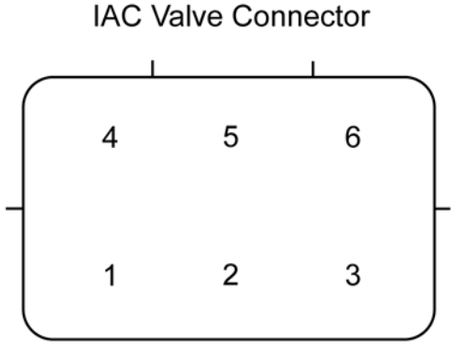


Mounted on the throttle body, the IAC contains 1 stepper motor which receives varying voltage signal pulses from the ECU. These pulses determine the IAC plunger setting, thereby controlling the amount of air bypassing the closed throttle body for idle control. If the IAC is disconnected or inoperative, it will remain at it's last operated position.

IAC Test

The IAC is a non-serviceable item. If it is faulty, it must be replaced. It can be 'bench tested' using the following method:

Set your meter to read Ohms. Check the resistance values at each of the following pin locations of the IAC. If any of the readings are out of specification, replace the IAC.

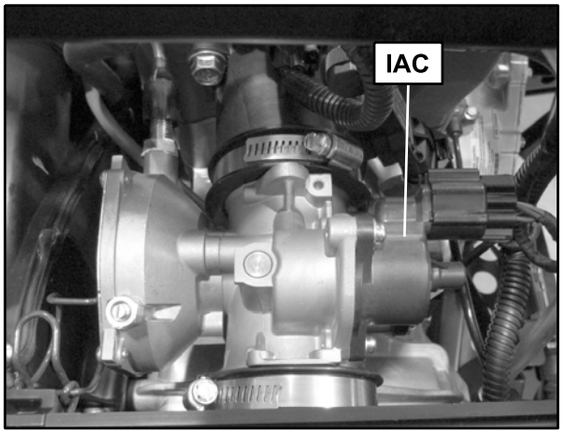


IAC Resistance Readings

PINS	RESISTANCE	PINS	RESISTANCE
1 - 2	**30 Ω ± 1.2 Ω**	4 - 5	**30 Ω ± 1.2 Ω**
2 - 3	**30 Ω ± 1.2 Ω**	5 - 6	**30 Ω ± 1.2 Ω**
1 - 3	**60 Ω ± 2.4 Ω**	4 - 6	**60 Ω ± 2.4 Ω**

IAC Replacement

1. Remove the right side panel and disconnect the negative (-) battery cable.
2. Disconnect the vehicle harness from the IAC motor.
3. Remove the (3) Phillips-head mounting screws and remove the IAC from the throttle body. The screws can also be accessed from the RH rear wheel well area.



4. Install the new IAC and torque the mounting screws to specification.

= T
IAC Mounting Screw: **17.7 in-lbs (2 ± 0.5 Nm)**

5. Reconnect the vehicle harness to the IAC motor.
6. Reinstall the right side panel, connect the negative (-) battery cable and install the drivers seat.

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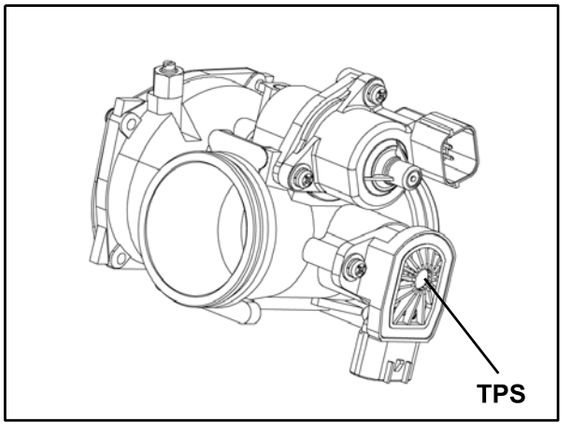
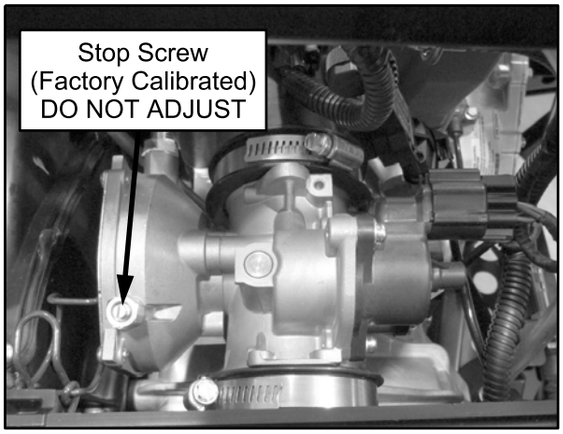
THROTTLE POSITION SENSOR (TPS)

Operation Overview

The throttle position sensor (TPS) is used to indicate throttle plate angle to the ECU. Mounted on the throttle body and operated directly off the end of the throttle shaft, the TPS works like a rheostat, varying the voltage signal to the ECU in direct correlation to the angle of the throttle plate. This signal is processed by the ECU and compared to the internal pre-programmed “maps” to determine the required fuel and ignition settings for the amount of engine load.



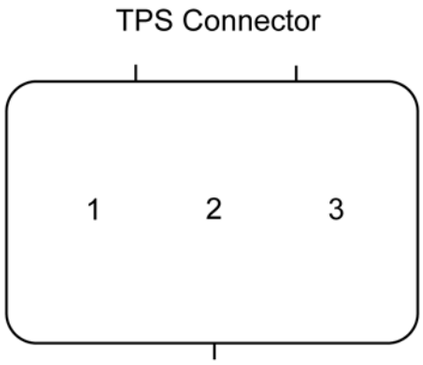


The correct position of the throttle body stop screw is established and set at the factory.
DO NOT loosen the throttle body stop screw or alter its position in any manner. The stop screw controls the air flow calibration of the throttle body. If the stop screw is repositioned or adjusted, the throttle body assembly must be replaced.

TPS Resistance Tests

The TPS is a non-serviceable item. If it is faulty, it must be replaced. It can be tested using the following method:

With the test leads connected and the meter set to the ohms scale, observe the reading at the following pin locations of the TPS:



TPS Resistance Readings

PINS	THROTTLE POSITION	RESISTANCE
2 - GND	———	¥
1 - 2	Closed	4kΩ - 5kΩ (reference)
1 - 2	Open	1150Ω - 1250Ω (reference)
1 - 3	———	4kΩ - 6kΩ

TPS Tester / Regulator

The TPS reading must be checked by using Digital Wrench Diagnostic Software.

TPS Replacement

NOTE: The correct position of the TPS angle on the throttle body is established and set at the factory. If the TPS is replaced or has been loosened it must be repositioned to obtain the proper voltage reading.

1. Disconnect the negative (-) battery cable.
2. Remove the seat, air box and PVT ducting, andright side panel.

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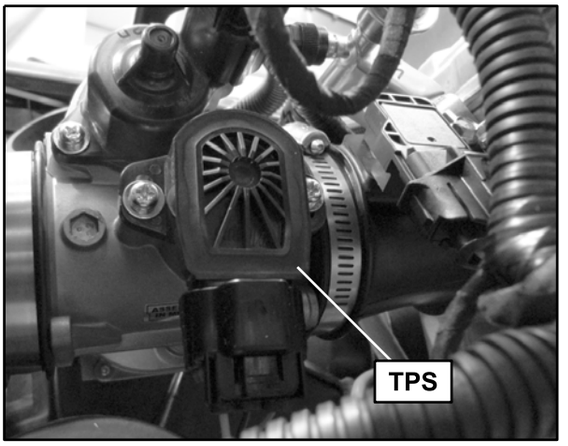
3. Disconnect the vehicle harness from the TPS.



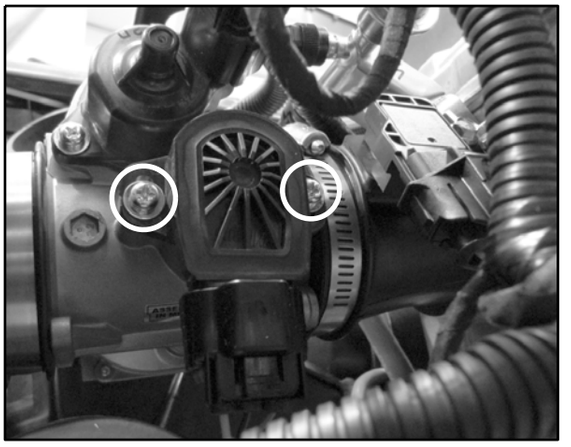
4. Remove the (2) Phillips-head mounting screws and replace the TPS. Reconnect the vehicle harness to the TPS.

NOTE: If replacing the TPS or throttle body, you must set the TPS voltage to specification.

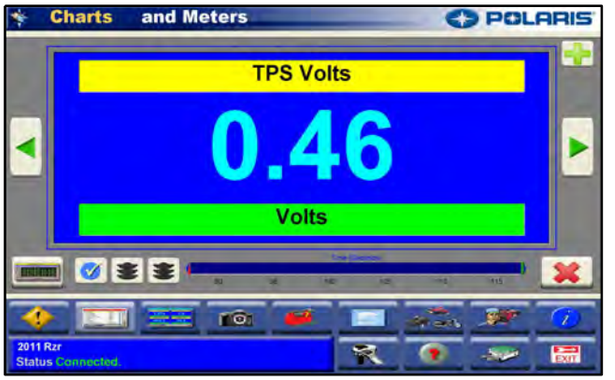
TPS Adjustment Using Digital Wrench :

5. Assemble SmartLink Module and connect the diagnostic interface cable to the vehicle to allow Digital Wrench use (see “Digital Wrench - Diagnostic Connector”).
6. Select the appropriate vehicle and open the data display grid. Click on the meter icon next to “TPS Volts”.

7. Loosen the TPS mounting screws.



8. Rotate the TPS until your display reading is within specification.



TPS Output Reading (Digital Wrench):
0.46 ± 0.03 Vdc

9. Retighten the TPS mounting screws and torque to specification.

= T

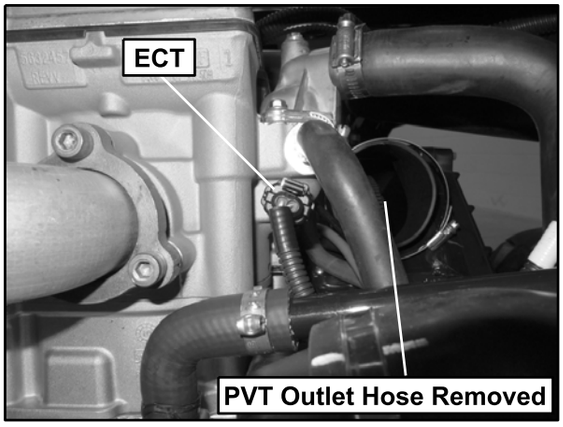
TPS Mounting Screws:
17.7 in-lbs (2 Nm)

10. Verify voltage reading did not change. If voltage reading is now out of specification, repeat steps 3 - 5.
11. Reinstall items that were removed to access TPS sensor.

ENGINE COOLANT TEMPERATURE SENSOR (ECT)

Operation Overview

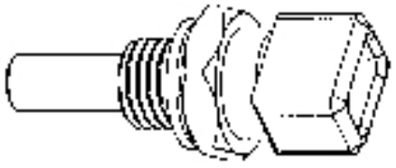
Mounted on the cylinder head, the engine temperature sensor measures coolant temperature. The engine temperature sensor is a Negative Temperature Coefficient (NTC) type sensor, as the temperature increases the resistance decreases.



Coolant passes through the cylinder and by the sensor probe, varying a resistance reading which is relayed to the ECU. This signal is processed by the ECU and compared to its programming for determining the fuel and ignition requirements during operation. The ECU also uses this signal to determine when to activate the fan during operation.

ECT Sensor Test

To quickly rule out other components and wiring related to the ECT, disconnect the harness from the ECT sensor and start the engine. After a few seconds, the fan should turn on and the “Check Engine” indicator should display on the instrument cluster. This indicates all other components are working properly.



ECT Sensor

Refer to Chapter 10 for additional ECT sensor information. Polaris dealers can test the sensor by using the Digital Wrench Diagnostic Software (dealer only).

ECT Sensor Resistance Readings

TEMPERATURE °F (°C)	RESISTANCE
68 °F (20 °C)	2.5 kΩ ± 6%
86 °F (30 °C)	1.7 kΩ ± 6%
104 °F (40 °C)	1.2 kΩ ± 6%
122 °F (50 °C)	834 Ω ± 6%
140 °F (60 °C)	596 Ω ± 6%
158 °F (70 °C)	435 Ω ± 6%
176 °F (80 °C)	323 Ω ± 6%
194 °F (90 °C)	243 Ω ± 6%
212 °F (100 °C)	186 Ω ± 6%

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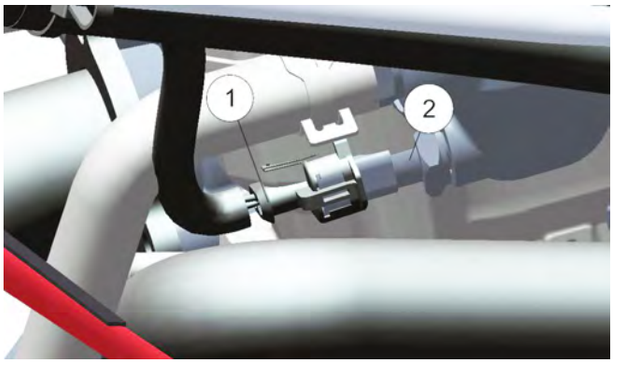
ECT Sensor Replacement

1. Remove the seat and right side panel .
2. Remove the PVT outlet ducting to access the ECT sensor.
3. Drain coolant to level below sensor.
4. Disconnect sensor from engine harness (1).



5. Using a wrench, remove and replace the sensor (2), applying a light coating of thread sealant to aid installation.
6. Torque the sensor to specification.

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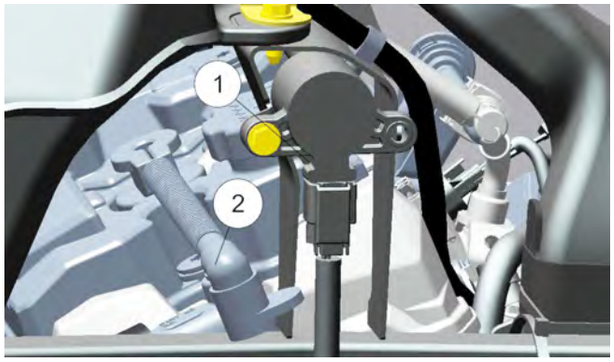
ECT: **17 ft-lbs (23 Nm)**

7. Add the required amount of coolant and properly bleed the cooling system.

IGNITION COIL

Operation Overview

The ignition coil is used to provide high voltage to fire the spark plug. When the ignition key is on, DC voltage is present in primary side of the ignition coil windings. During engine rotation, an AC pulse is created within the crankshaft position sensor for each passing tooth on the flywheel. The two-tooth gap creates an “interrupt” input signal, corresponding to specific crankshaft position. This signal serves as a reference for the control of ignition timing. The ECU then calculates the time interval between the consecutive pulses, and determines when to trigger the voltage spike that induces the voltage from the primary to the secondary coil windings to fire the spark plug.

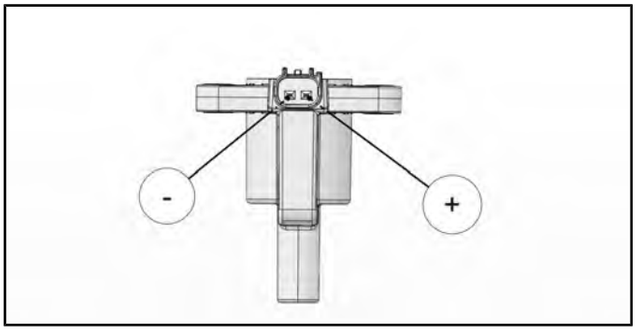


Ignition Coil / Wire Testing

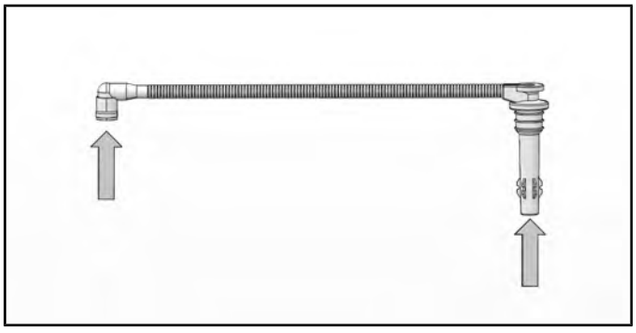
The ignition coil can be tested using an digital multimeter. Use the following specification table and illustrations to test the ignition coil.

TEST	CONNECTION	RESISTANCE
Primary Coil	Coil Pack + and – Pins	0.50Ω +/- 10%
Secondary Coil	Coil Pack – and Spark Plug Wire Terminal	6.6kΩ +/- 10%
Spark Plug Wire	Wire Connector Terminal and Spark Boot Terminal	7.0kΩ +/- 10%

Coil Pack Connections



Spark Plug Wire Connections



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EFI DIAGNOSTICS

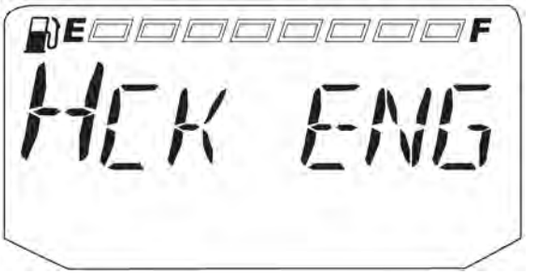
Instrument Cluster Trouble Code Display

NOTE: The diagnostic mode is accessible only when the check engine MIL has been activated.

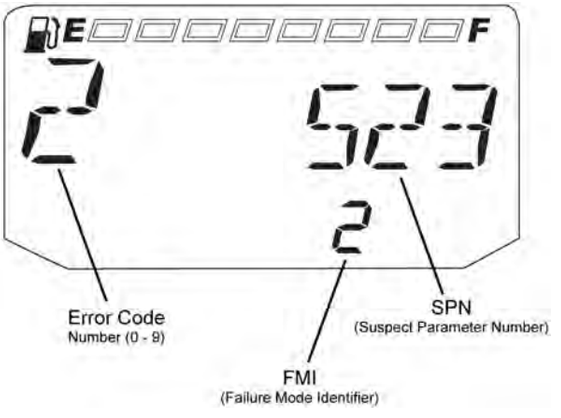
Use the following procedure to display diagnostic trouble codes that were activated during current ignition cycle causing the MIL to illuminate. Diagnostic trouble codes will remain stored in the gauge (even if MIL turns off) until the key is turned off.

NOTE: If there is a diagnostic problem with the power steering system, the power steering MIL will illuminate and blink in place of the check engine MIL.

1. If the trouble code(s) are not displayed, use the MODE button to toggle until “CK ENG” displays on the information display area.



2. Press and hold the MODE button to enter the diagnostics code menu.
3. A set of three numbers will appear in the information area.
   - The first number (located far left) can range from 0 to 9. This number represents the total number of trouble code present (example: 2 means there are 3 codes present).
   - The second number (located top right) can be 2 to 6 digits in length. This number equates to the suspected area of fault (SPN).
   - The third number (located bottom right) can be 1 to 2 digits in length. This number equates to the fault mode (FMI).



4. If more than one code exists, press the MODE button to advance to the next trouble code.
5. To exit the diagnostic mode, press and hold the MODE button or turn the ignition key OFF once the codes are recorded.

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DIAGNOSTIC TROUBLE CODE TABLE

COMPONENT	CONDITION	SPN	FMI	DIGITAL WRENCH P-CODE
Throttle Position Sensor (TPS)	Voltage Too High	51	3	P0123
	Voltage Too Low		4	P0122
Vehicle Speed Signal	Data Erratic or Intermittent (or missing)	84	2	P0503
	Received Vehicle Speed Has Error		2	C1069
Manifold Absolute Pressure Sensor (T-MAP)	Voltage Too High	102	3	P0108
	Voltage Too Low		4	P0107
Intake Air Temperature (T-MAP)	Voltage Too High	105	3	P0113
	Voltage Too Low		4	P0112
Engine Temperature Sensor (ECT)	Voltage Too High	110	3	P0118
	Voltage Too Low		4	P0117
	Temperature Too High		16	P0217
	Engine Overheat Shutdown		0	P1217
System Power (Battery Potential / Power Input)	Voltage Too High	168	3	P0563
				C1063
	Voltage Too Low		4	P0562
				C1064
Engine Speed	Received Engine Speed Has Error	190	0	C1059
	Engine Speed Too High		0	C1066
Gear Sensor Signal	Voltage Too Low	523	4	P0916
ECU Memory	EEPROM: Read/Write Failure	628	12	C1073
Calibration	Checksum / CRC Error	630	12	C1073
Crankshaft Position Sensor (CPS)	Plausibility Fault	636	2	P0335
Injector 1 (MAG)	Driver Circuit Open / Grounded	651	5	P0261
	Driver Circuit Short to B+		3	P0262
	Driver Circuit Grounded		4	P1262
Rear Differential Output (INTL)	Driver Circuit Open / Grounded	746	5	P1691
	Driver Circuit Short to B+		3	P1692
	Driver Circuit Grounded		4	P1693
Fan Relay Driver Circuit	Driver Circuit Open / Grounded	1071	5	P1481
	Driver Circuit Short to B+		3	P1482
	Driver Circuit Grounded		4	P1483
Ignition Coil Primary Driver 1 (MAG)	Driver Circuit Short to B+	1268	3	P1353
Fuel Pump Driver Circuit	Driver Circuit Open / Grounded	1347	5	P0230
	Driver Circuit Short to B+		3	P0232
	Driver Circuit Grounded		4	P0231
ECU Output Supply Voltage 1	Voltage Too High	3597	3	P16A2
	Voltage Too Low		4	P16A1
ECU Output Supply Voltage 2	Voltage Too High	3598	3	P16A9
	Voltage Too Low		4	P16A8
All Wheel Drive Control Circuit (AWD)	Driver Circuit Open / Grounded	520207	5	P1836
	Driver Circuit Short to B+		3	P1835
	Driver Circuit Grounded		4	P1834
Idle Air Control Valve (IAC) M17; IAC Stepper Pin 1	Driver Circuit Open / Grounded	520271	5	P1505
	Driver Circuit Short to B+		3	P1509
	Driver Circuit Grounded		4	P1508
Idle Air Control Valve (IAC) M17; IAC Stepper Pin 3	Driver Circuit Open / Grounded	520268	5	P1515

COMPONENT	CONDITION	SPN	FMI	DIGITAL WRENCH P-CODE
	Driver Circuit Short to B+		3	P1519
	Driver Circuit Grounded		4	P1518
Idle Air Control Valve (IAC) M17; IAC Stepper Pin 4	Driver Circuit Open / Grounded	520269	5	P1525
	Driver Circuit Short to B+		3	P1529
	Driver Circuit Grounded		4	P1528
Idle Air Control Valve (IAC) M17; IAC Stepper Pin 6	Driver Circuit Open / Grounded	520270	5	P1535
	Driver Circuit Short to B+		3	P1539
	Driver Circuit Grounded		4	P1538

EFI Troubleshooting

Fuel Starvation / Lean Mixture

Symptoms: Hard start or no start, bog, backfire, popping through intake / exhaust, hesitation, detonation, low power, spark plug erosion, engine runs hot, surging, high idle, idle speed erratic.

- No fuel in tank
- Restricted tank vent, or routed improperly
- Fuel lines or fuel injectors restricted
- Fuel filter plugged
- Fuel pump inoperative
- Air leak in system
- Intake air leak (throttle shaft, intake ducts, airbox or air cleaner cover)
- Incorrect throttle stop screw adjustment

Rich Mixture

Symptoms: Fouls spark plugs, black, sooty exhaust smoke, rough idle, poor fuel economy, engine runs rough/ misses, poor performance, bog, engine loads up, backfire.

- Air intake restricted (inspect intake duct)
- Air filter dirty/plugged
- Poor fuel quality (old fuel)
- Fouled spark plug
- TPS setting incorrect
- Injector failure

Poor Idle

Symptom: Idle Too High (If greater than 1300 RPM when engine is warm).

- Throttle stop screw set incorrect
- Throttle cable sticking, improperly adjusted, routed incorrectly

Symptom: Idle Too Low (if less than 900 RPM when engine is warm).

- Plugged air filter
- Leaking injector (rich condition)
- Belt dragging
- Throttle stop screw tampering

Symptom: Erratic Idle.

- Throttle cable incorrectly adjusted
- Air Leaks, dirty injector
- TPS damaged or adjusted
- Tight valves
- Ignition timing incorrect
- Belt dragging
- Dirty air cleaner

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- Engine worn
- Spark Plug fouled
- Throttle stop screw set incorrectly (out of sync with ECU)

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DIGITAL WRENCH OPERATION

Digital Wrench Diagnostic Software Overview

NOTE: Refer to Section 2, 3 and 4 in the Instruction Manual provided in the Digital Wrench Diagnostic Kit to install the Polaris Digital Wrench diagnostic software on your computer.

The Digital Wrench diagnostic software allows the technician to perform the following tests and observations:

- View or clear trouble codes
- Analyze real-time engine data
- Reflash ECU calibration files
- Perform guided diagnostic procedures
- Create customer service account records
- Perform output state control tests (on some models)

Special Tools

DIGITAL WRENCH DIAGNOSTIC SOFTWARE	PART NUMBER
Digital Wrench Diagnostic Kit	PU-47063-A
PU-47063-B (listed above) INCLUDES:	Digital Wrench Software: PU-48731
	Standard Interface Cable: PU-47151
	SmartLink Module Kit: PU-47471
Fuel Pressure Gauge Kit	PU-43506-A
Fuel Pressure Gauge Adapter	PV-48656
Fluke 73 Digital Multi-Meter or Fluke 77 DMM	PV-48656 (Fluke 77: PV-43568)
Laptop or Desktop Computer USB/Serial Adaptor: Saelig RS-232	Commercially Available (refer to diagnostic software user manual or HELP section for minimum requirements)

Diagnostic Software Version

Always use the most current version of the Digital Wrench software to ensure you have the latest updates or enhancements. New reprogramming files and guided diagnostic procedures are added to these updates as they become available. For information on how to determine if you have the latest update available, refer to “Digital Wrench Version and Update ID”.

ECU Replacement

Although the need for ECU replacement is unlikely, a specific replacement procedure is required to ensure that all essential data contained within the original ECU is transferred to the replacement ECU.

Refer to procedure and carefully follow all instructions provided in Digital Wrench.

Guided Diagnostic Available

Guided diagnostics are available within Digital Wrench for all supported Trouble Codes (that is, any fault that will turn on the ‘Check Engine’ indicator).

In addition, guided diagnostics are also available for many other electrical sub systems.

Diagnostic procedures are added to subsequent versions of Digital Wrench as they become available. Check your release version often and upgrade when available to be sure you are using the most current software available.

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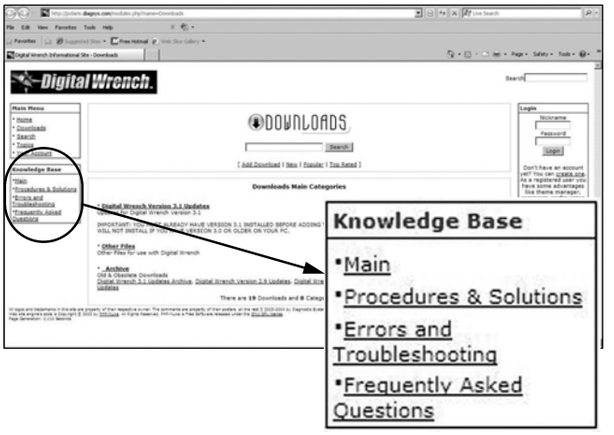
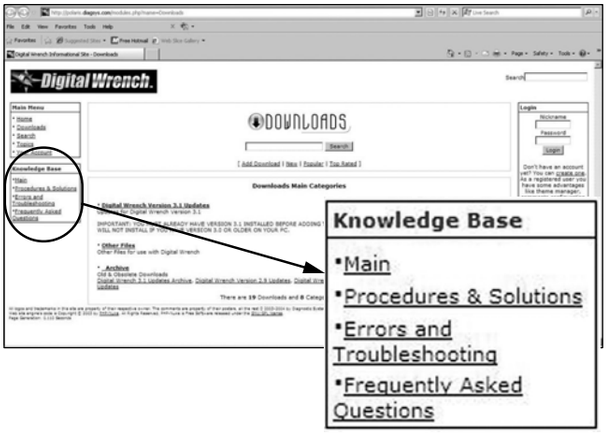
Digital Wrench Communication Errors

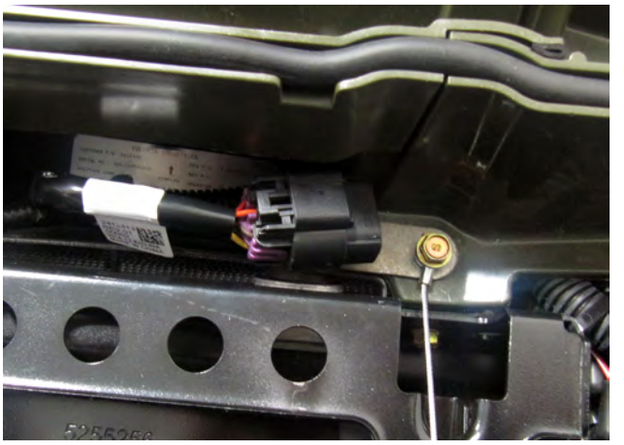
If you experience problems connecting to a vehicle or any Digital Wrench related problem, visit the Digital Wrench Knowledge Base for the most current troubleshooting information, FAQs, downloads and software updates at: *http://polaris.diagsys.com/.*





Digital Wrench - Diagnostic Connector

Located under the front rack; connected to a sealed plug.



Follow these steps to connect the diagnostic interface cable to the vehicle to allow Digital Wrench use:

1. Assemble the SmartLink Module and attach the PC Interface Cable to your laptop (see page 4.3).
2. Remove the protective cap from the Digital Wrench connector.
3. Connect the Vehicle Interface Cable to the Digital Wrench diagnostic connector.
4. Turn the ignition key to the ‘ON’ position, select the appropriate vehicle and wait for the status to display ‘Connected’ in the lower left corner of the screen.
5. Once connected, proceed with using Digital Wrench.

Digital Wrench Serial Number Location

Open the configuration screen by clicking on the wrench icon. The serial number is located on the right side of the screen.

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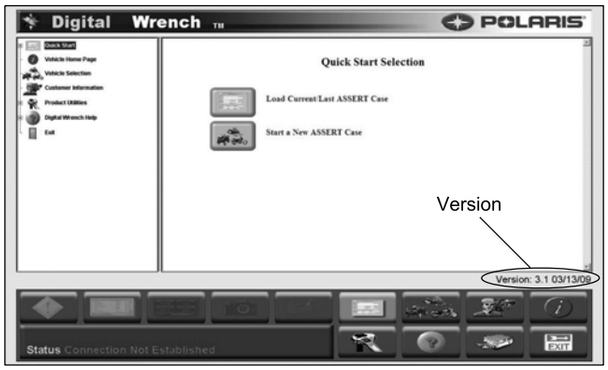
Digital Wrench Version and Update ID

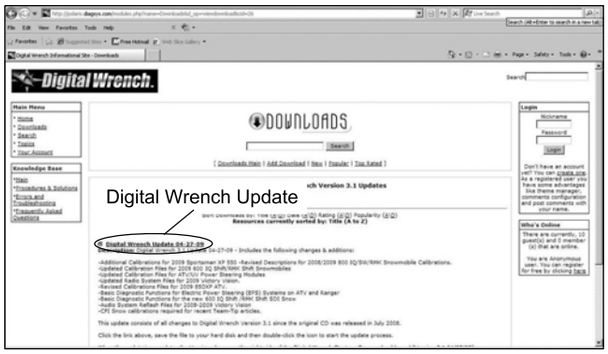
Knowing what Digital Wrench version and update is installed will help determine which updates are required.

NOTE: Versions and updates are subject to change.

1. Open the Digital Wrench software. Locate the version ID shown on the lower right side of the Digital Wrench start-up screen.



2. Proceed to *http://polaris. diagsys. com* to see if a newer update is available.



3. If a newer update is available, it should be downloaded before using Digital Wrench (see "Digital Wrench Updates").

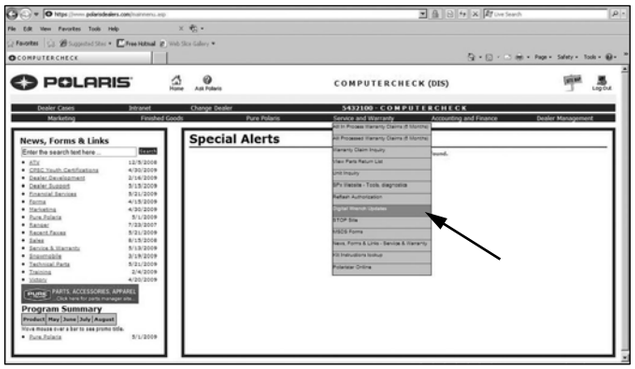
   NOTE: Always operate with the latest update.

Digital Wrench Updates

Updates are released for Digital Wrench via the Internet at: *http://polaris. diagsys. com*. The Digital Wrench website can also be accessed through the dealer website at: *www.polarisdealers.com*.

NOTE: Only authorized Polaris dealers and distributors can access the dealer website.

1. Log on to *www.polarisdealers.com*.
2. Locate the "**Service and Warranty**" drop-down menu.
3. Click on "**Digital Wrench Updates**".



4. The Digital Wrench portal website should appear in a new web browser.
5. Click on "**Digital Wrench Version Updates**".

NOTE: You must already have the current version installed before adding an update. Updates will not install if you are using an older version loaded on your PC.

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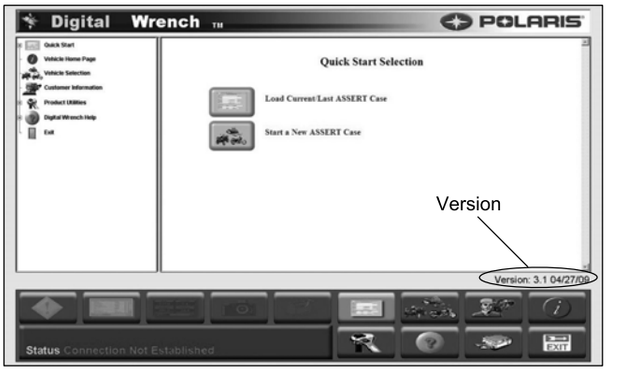
6. If the update file date listed is newer than your current version and update (see “Digital Wrench Version and Update ID”), download the file.

7. Click on the link shown above, save the file to your hard disk and then double-click the icon to start the update process.

   NOTE: Do not "run" or "open" the file from where they are. Select "save" and download them to your PC before running the install.

8. When the update is complete, the version shown on the right side of the Digital Wrench start-up screen should match the update you just downloaded.



NOTE: Versions and updates are subject to change.

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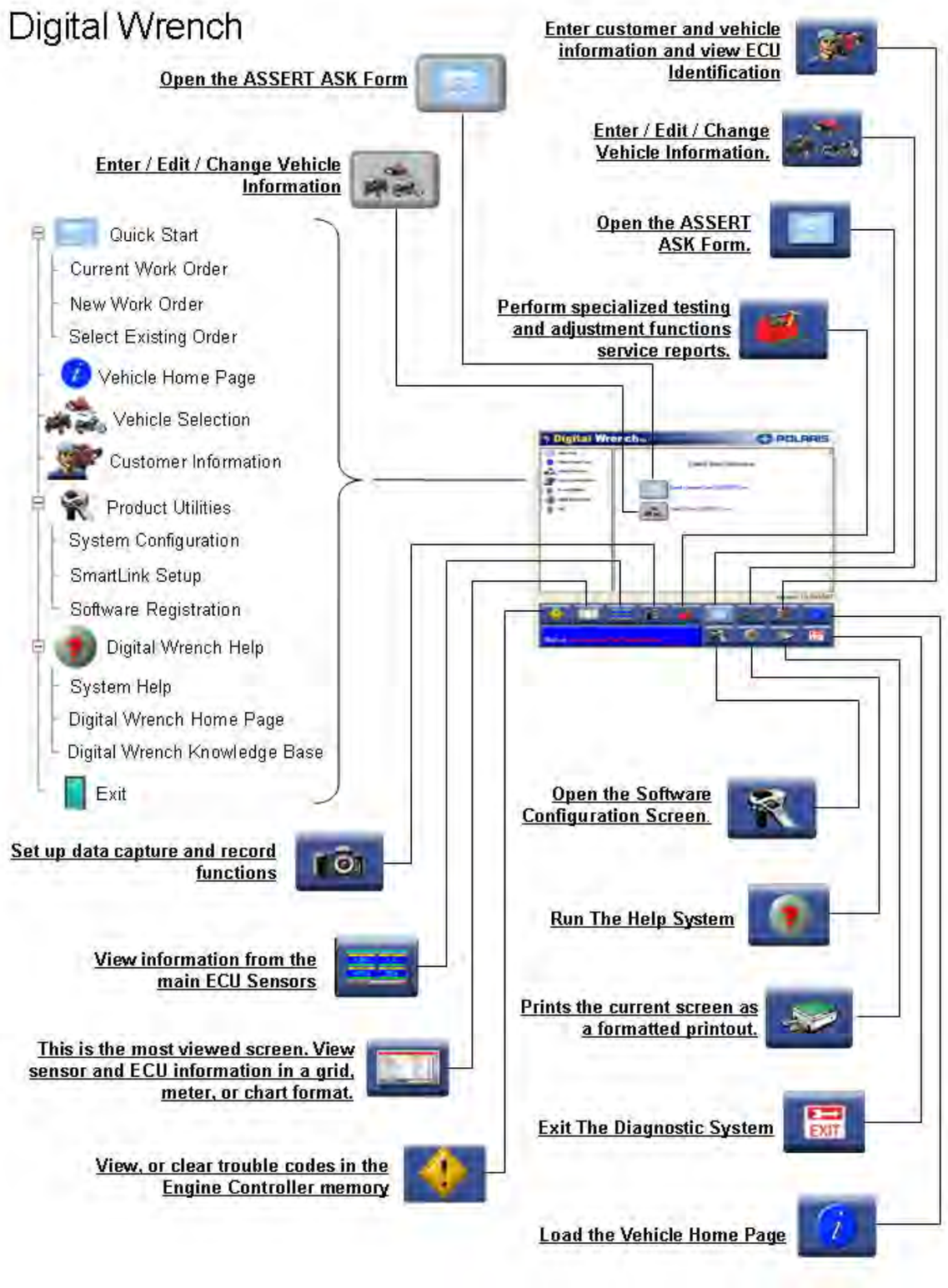
Digital Wrench Feature Map



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Engine Controller Reprogramming (Reflash)

Process Overview

The reprogramming feature is in the Special Tests menu on the Digital Wrench screen. Start Digital Wrench and click on the Special Tests menu icon (red tool box). A technician should be familiar with the process and with computer operation in general before attempting to reprogram an ECU.

The Digital Wrench Engine Controller Reprogramming (or “Reflash”) feature allows reprogramming of the ECU fuel and ignition map. To successfully reprogram the ECU, an Authorization Key must be obtained by entering a Request Code in the box provided on the Reflash Authorization site. The Request Code is automatically generated by Digital Wrench during the reprogramming process. The Reflash Authorization site is located under the “**Service and Warranty**” drop down menu on the dealer website at: *www.polarisdealers.com*.

NOTE: Failure to follow the reprogramming instructions completely and correctly can result in an engine that does not run! Replacement ECUs are programmed as “no-start” and require a reflash for them to work.

Reprogramming (Reflash) Tips:

- BATTERY VOLTAGE: The majority of problems with reprogramming can be attributed to a low battery. Be sure the battery voltage (no load) is at least 13 volts and at least 12.5 volts with the key ‘ON’. Connect a battery charger if necessary to bring voltage level above minimum. Fully charge the battery before you attempt to reprogram.
- DEDICATED LAPTOP: Best results are obtained using a laptop computer that is “dedicated to Digital Wrench”. A laptop that is used by a variety of people and in several applications around the dealership is more likely to cause a reprogramming problem than one dedicated to Digital Wrench diagnostics only.
- OBTAINING THE LATEST UPDATE: Reprogramming updates are provided periodically and contain the most recent calibrations (see “Digital Wrench Updates”).
- CLOSE NON-ESSENTIAL PROGRAMS: Polaris recommends that you DO NOT install non-essential programs on a Service Department laptop. Camera detection software, Virus Scanners, Tool Bars, etc. may clog up memory if running in the background and make it harder for the diagnostic software to operate.
- KNOW THE PROCESS: If you are not familiar with the entire reprogramming process, review the HELP section of the diagnostic software before you attempt reprogramming. Click on the **?** on the tool bar or press F11. The information in the on-line help is the most current and complete information available. This should be your first step until you are familiar with the process.
- COMMUNICATION PROBLEMS: If you have had problems communicating with a vehicle while performing diagnostic functions, do not attempt reprogramming until the cause has been identified and fixed. Check all connections, and be sure battery voltage is as specified.

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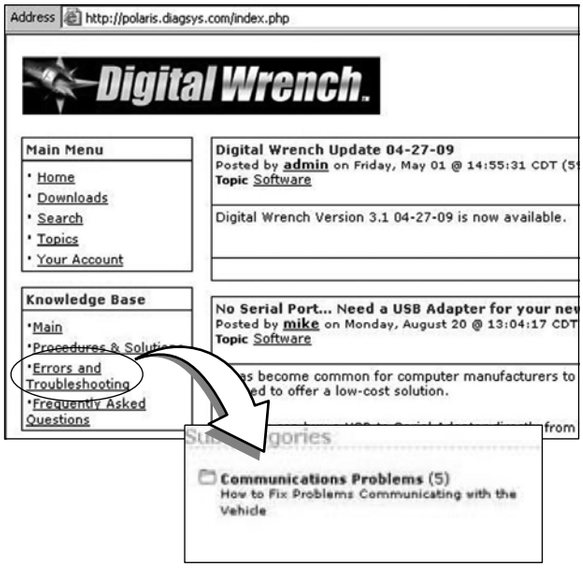
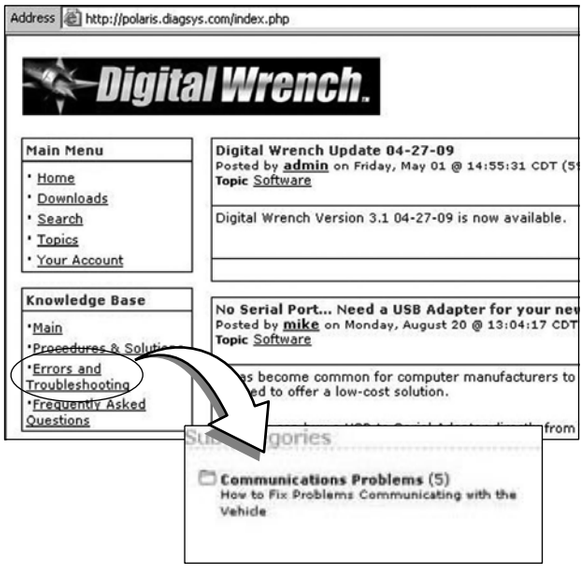
- Proceed to *http://polaris.diagsys.com* for specific information and FAQs on how to troubleshoot communication problems.



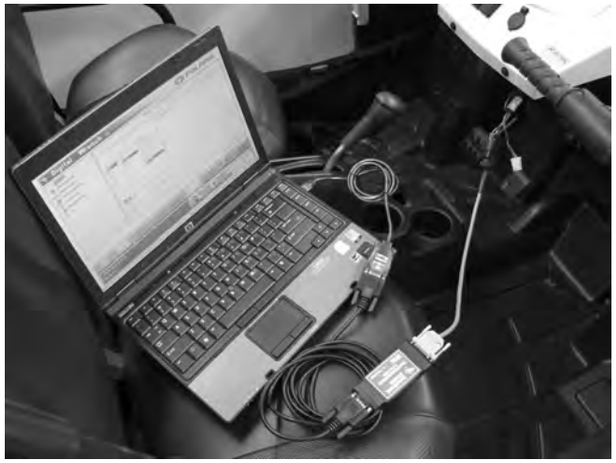


- DON'T DISTURB THE PC: While reprogramming is in progress, don't move the mouse and don't touch the keyboard. The process only takes a few minutes, and is best left alone until complete.

Reprogramming (Reflash) Procedure:

If you are not familiar with the reprogramming process, review the "Reprogramming (Reflash) Tips" before you begin. Follow the on-screen instructions as you progress through the steps. If you encounter a problem, always check the On-Line help for current tips and information.

1. Verify the most current update has been downloaded and loaded into Digital Wrench. See "Digital Wrench Version and Update ID" See "Digital Wrench Version and Update ID"., page 4.41
2. Connect the SmartLink Module cables to the PC and vehicle. See "Digital Wrench - Diagnostic Connector "See "Digital Wrench - Diagnostic Connector"., page 4.40



3. Open the Digital Wrench program.

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4. Select the model year, product line and vehicle description by selecting the “Change Vehicle Type” icon.

5. Select the “Special Tests” icon.

6. Select “Engine Controller Reprogramming”.

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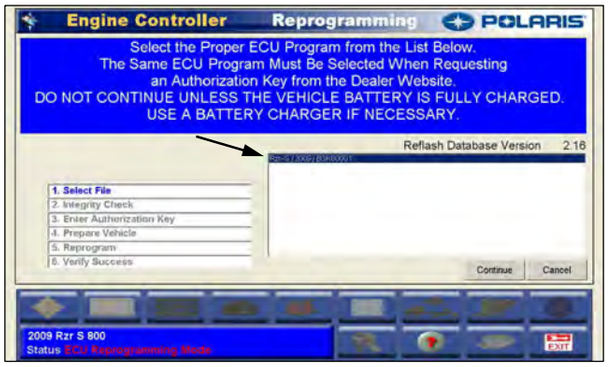
7. Select the file you want to load into the ECU then click the “Continue” icon to proceed to the Integrity Check.

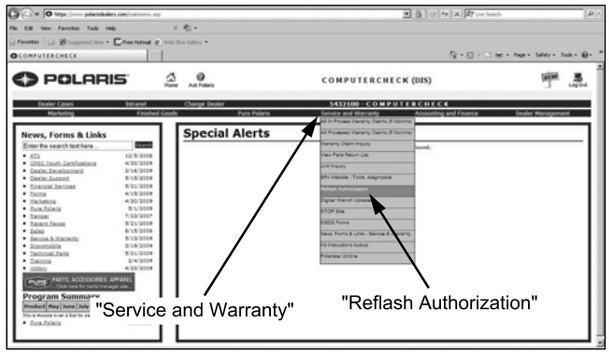


8. Follow the on screen instructions. Click the “Continue” icon to obtain a Request Code.

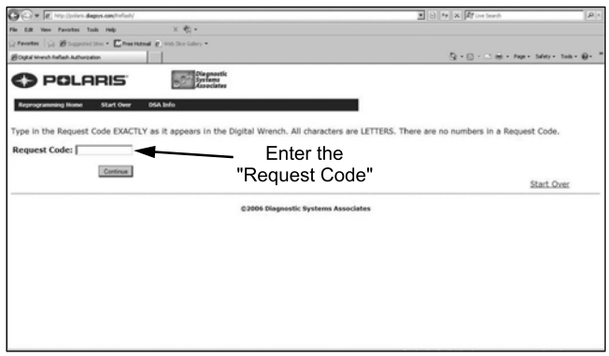
9. Copy (CTRL +C) the Request Code that will be required on the dealer website in the next step. DO NOT CLOSE Digital Wrench or the Request Code will be invalid. **NOTE: All characters are letters; there are no numbers in a request code.**

NOTE: Request Codes and Authorization Keys must be entered EXACTLY as they appear on the screen.

10. Go to *www.polarisdealers.com* and click on “ReFlash Authorization” from the “Service and Warranty” drop-down menu.



11. Enter or paste (CTRL+V) the Request Code into the box.



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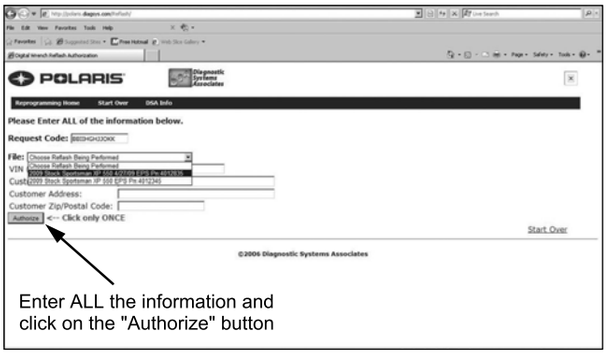
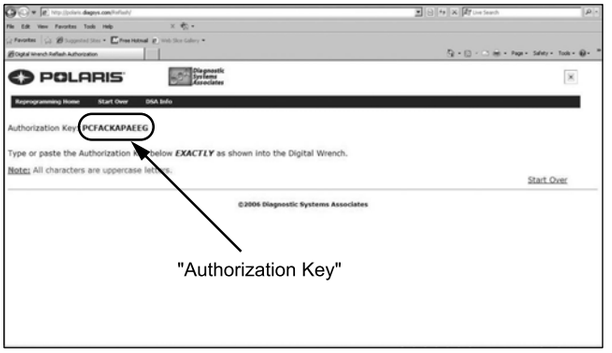
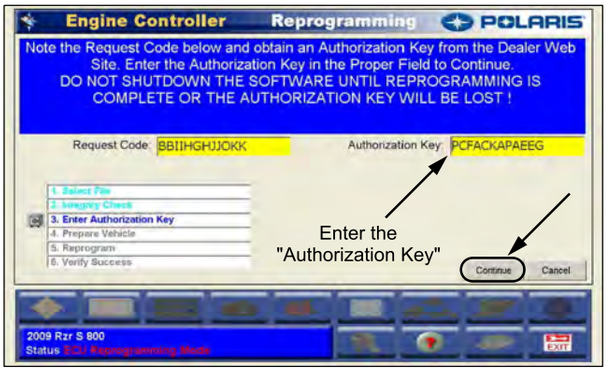
12. Select the same file type from the list that you selected previously while in Digital Wrench. Enter the VIN along with the customer's name and address. When completed, click the Authorize button *once* to proceed.



13. An "Authorization Key" will appear in the upper left corner of the screen. Copy (CTRL +C) this key exactly as it appears.



14. Enter or paste (CTRL +C) the Authorization Key in the box located on the Digital Wrench screen. Click the 'Continue' button and follow instructions provided on the screen to complete the reprogramming procedure.



15. At this point the reflash process will begin. Do not touch the vehicle or PC during the process.

16. Once the ECU reprogramming procedure is complete, click the 'Finish' button on the screen. Verify the reflash was a success by starting the vehicle.

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CHAPTER 5
BODY / STEERING / SUSPENSION

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GENERAL INFORMATION

Torque Specifications

COMPONENT	FT-LBS (IN-LBS)	NM
Front Hub Nut	60	81
Front A-Arm Attaching Bolt	37	50
Front A-Arm Ball Joint Stud Nut	30	41
Handlebar Adjuster Block	14	23
Master Cylinder Clamp Bolt	(45-55)	5.2-6.3
Rear Shock Bolt (Upper)	30	41
Rear Shock Bolt (Lower)	30	41
Rear Wheel Hub Nut	80	109
Upper Stabilizer Support Nuts	17	27
Upper Control Arm Mounting Bolt	37	50
Lower Wheel Bearing Carrier Bolt	37	50
Strut Rod Retaining Nut (Top)	15	21
Strut Casting Pinch Bolt	17	27
Tie Rod End Jam Nut	12	17
Tie Rod End Castle Nut	45	61
Tie Rod End Attaching Bolt	24	33
Upper Shock Mounting Bolt	37	50
Lower Shock Mounting Bolt	37	50

NOTE: Refer to exploded views throughout this chapter for identification and location of components.

Special Tools

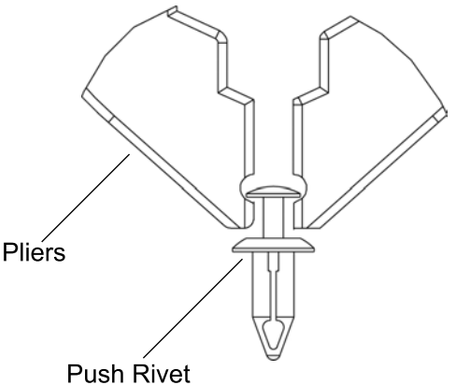
PART NUMBER	DESCRIPTION
2870871	Ball Joint Replacement Tool
2870872	Shock Spanner Wrench
2870623	Shock Absorber Spring Compression Tool
2871572	Strut Rod Wrench
2871573	LH Strut Spring Compressor
2871574	RH Strut Spring Compressor

Bosch Automotive Service Solutions: 1-800-328-6657 or online at

http://polaris.service-solutions.com

Multi-Function Pliers

Included in the tool kit, the multi-function pliers is designed to remove the plastic push rivets used to fasten body components.



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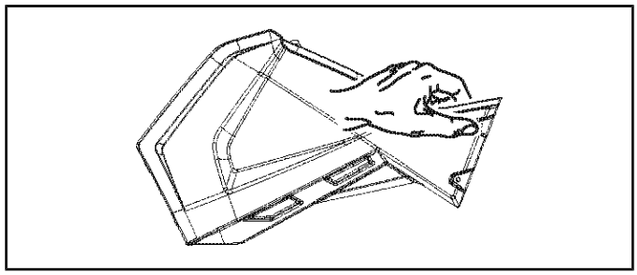
BODY

Side Panel Removal

Side panel removal is quick and easy, use the following instructions for removal and installation.

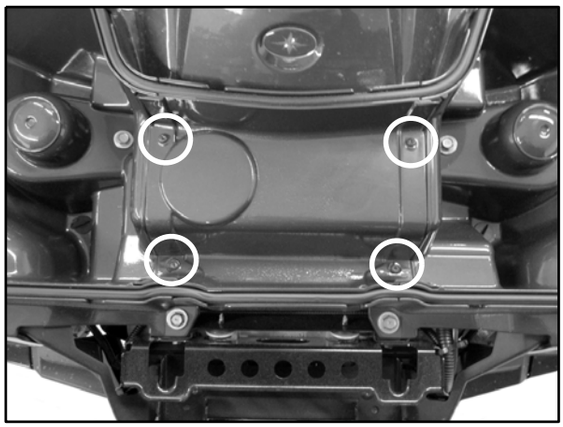
1. Grasp one side of the seat near the rear edge.
2. Pull upward abruptly to disengage the under-seat fasteners.
3. Remove the seat.
4. Remove the plastic rivets securing the side panel.
5. Grasp the rear of the side panel near the rear cab. With a firm motion, pull the side panel outward to remove the side panel.



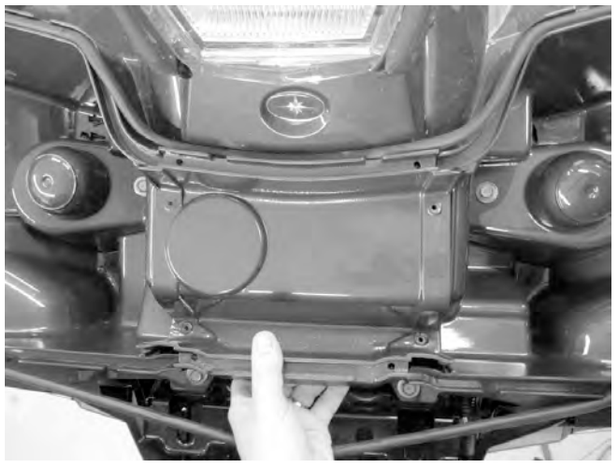
6. Reinstall the side panel by reversing the removal procedure.

Front Storage Box Lid / Front Rack and Access Panel Removal / Installation

1. Open the front rack storage area.
2. Remove the (4) T-25 screws securing the access cover to the front cab as shown below.



3. Move the seal out of the sealing channel and pull up on the front of the access cover. Remove the access cover.



4. Remove the safety cables that are attached to the front cab and to the front storage box lid / front rack.
5. Remove the (2) T-27 screws that attach the front storage box lid / front rack to the front bumper.

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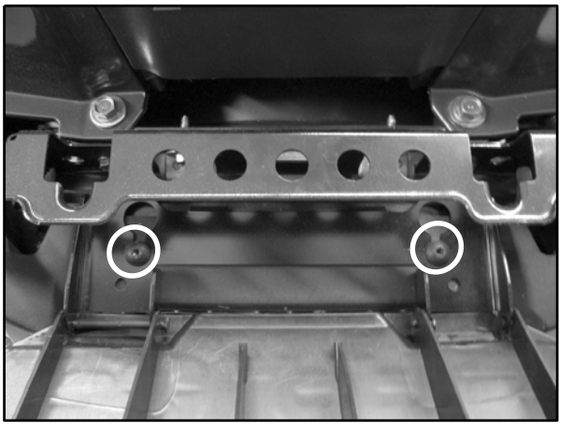
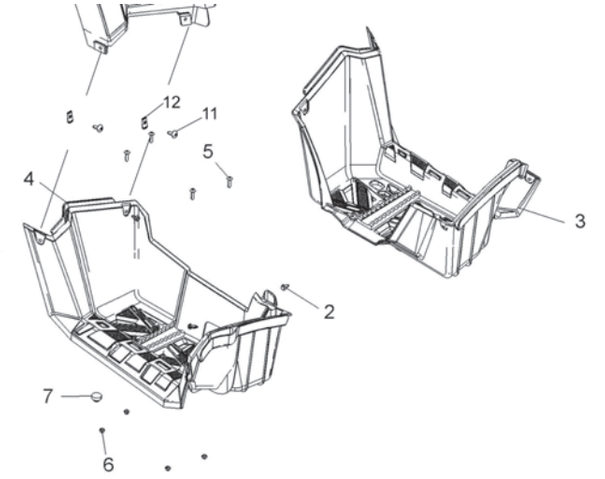
6. Remove the front storage box lid / front rack from the vehicle.



7. Reverse procedure for installation.

Footwell Removal / Installation



1. Remove the plastic inserts(2) that secure the footwell to the front fenders.
2. Remove the screws (11) that secure the footwell to the rear fenders
3. Remove the screws (5) from the bottom of the foot well. Remove the footwell.
4. Reverse the removal procedures to install the foot well. Be sure to properly align the fender ends into the foot wells upon reassembly.

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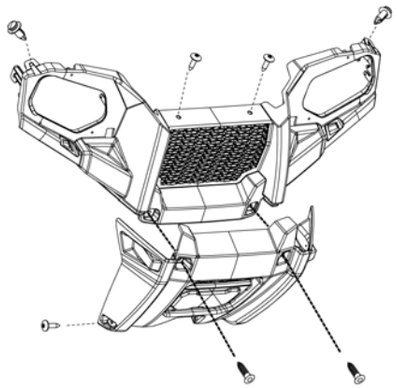
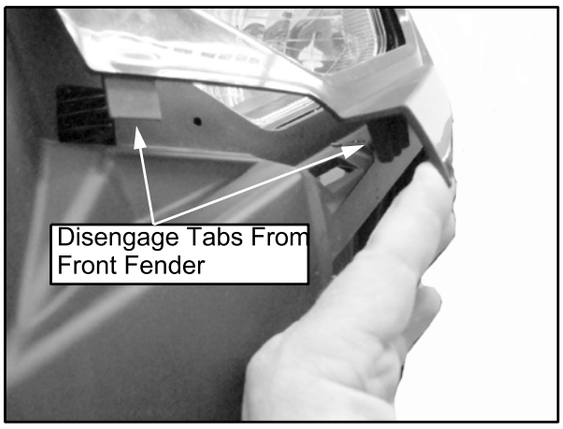
Front Bumper Removal / Installation

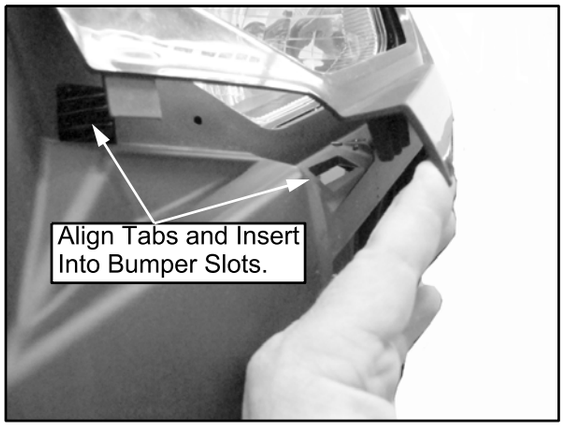
1. Remove front rack / storage box lid as outlined in this chapter.
2. Disconnect head lamp connectors, leaving the bulb in the head lamp housing.
3. Remove lower portion of the front bumper by removing the 4 T27 bolts that attach it to the frame. Pull bumper strait out to remove.
4. Remove the (2) plastic rivets that attach the upper front bumper to the front fenders.
5. Remove to (2) T27 bolts that attache the upper front bumper to the frame.



6. Disengaged the 4 plastic tabs from the front fender that engage into the upper front bumper by gently pressing down on the bumper and pulling up on the front fender.



7. Remove the front bumper by gently the pulling the lower portion of the bumper away from the vehicle frame and sliding it down.
8. To reinstall the front bumper, reverse order of removal. Be sure that the 4 plastic locking tabs of the front fender are properly seated into the 4 slots of the upper front bumper.



9. Torque the (6) T27 fasteners to specification.

= T
T27 Fasteners: **4-6 ft-lbs (6-8 Nm)**

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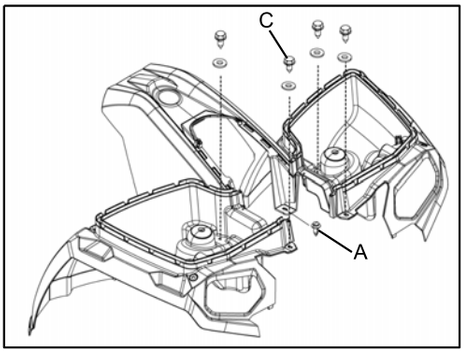
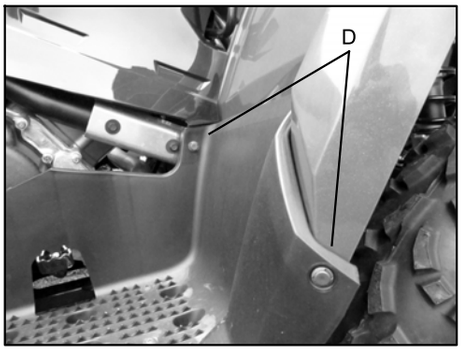
Front Fender Removal / Installation

1. Remove the front rack / storage box lid and the front bumper as outlined in this chapter.
2. Remove the plastic inserts (A) that secure the front fender to the upper strut support.
3. Remove the screws that secure the front fender to the frame in the fuel tank mount area.
4. Remove the screws (C) that attach the front cab to the frame in the front rack area.



5. Remove the seat and side panels, refer to the “SIDE PANEL REMOVAL” section.
6. Remove the plastic inserts (D) that secure the front of the foot wells to the front fender.



7. Remove the fuel cap and place a clean lint free shop towel into the tank neck to keep any debris from falling into the tank.
8. The front fender should now slide back over the fuel tank and fuel tank neck.
9. Reverse the removal steps for installation. Torque (6) front fender-to-frame screws to specification.

= T
Fender to Frame Screws **24 in-lbs (2.7 Nm)**

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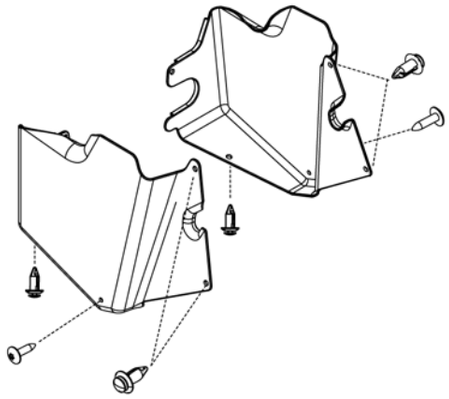
Mud Guard Removal / Installation

1. Remove front bumper as outline in this chapter.
2. Locate the mud guards in the front wheel area.
3. Remove the (1) T27 bolt and the (3) plastic rivets per side.



4. Remove the wheel well from the vehicle frame.
5. Reverse this procedure to reinstall the mud guards.
6. Torque the T27 fasteners to specification.

= T
T27 Fasteners: **4-6 ft-lbs (6-8 Nm)**

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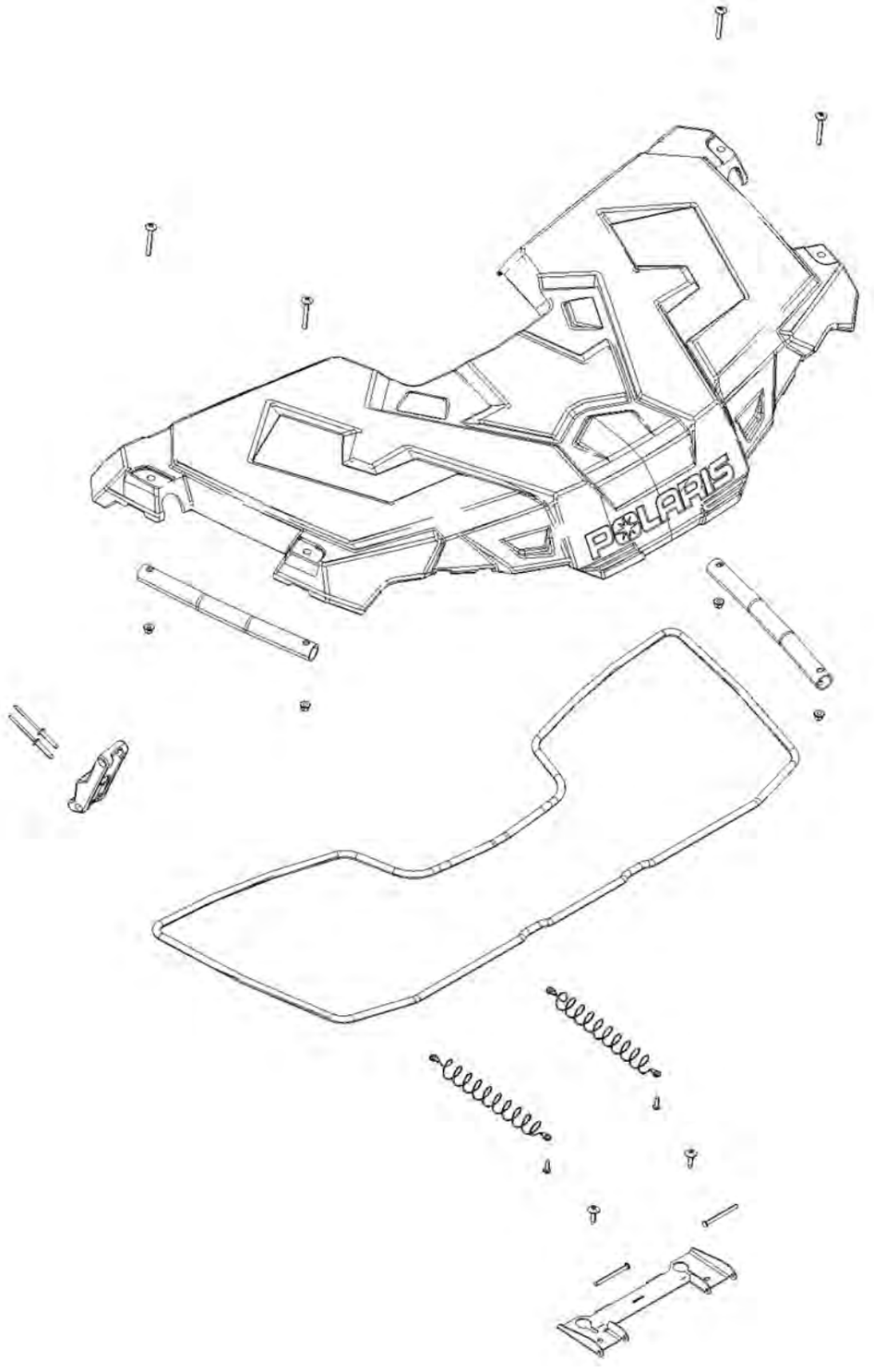
Front Rack / Storage Box Lid Assembly



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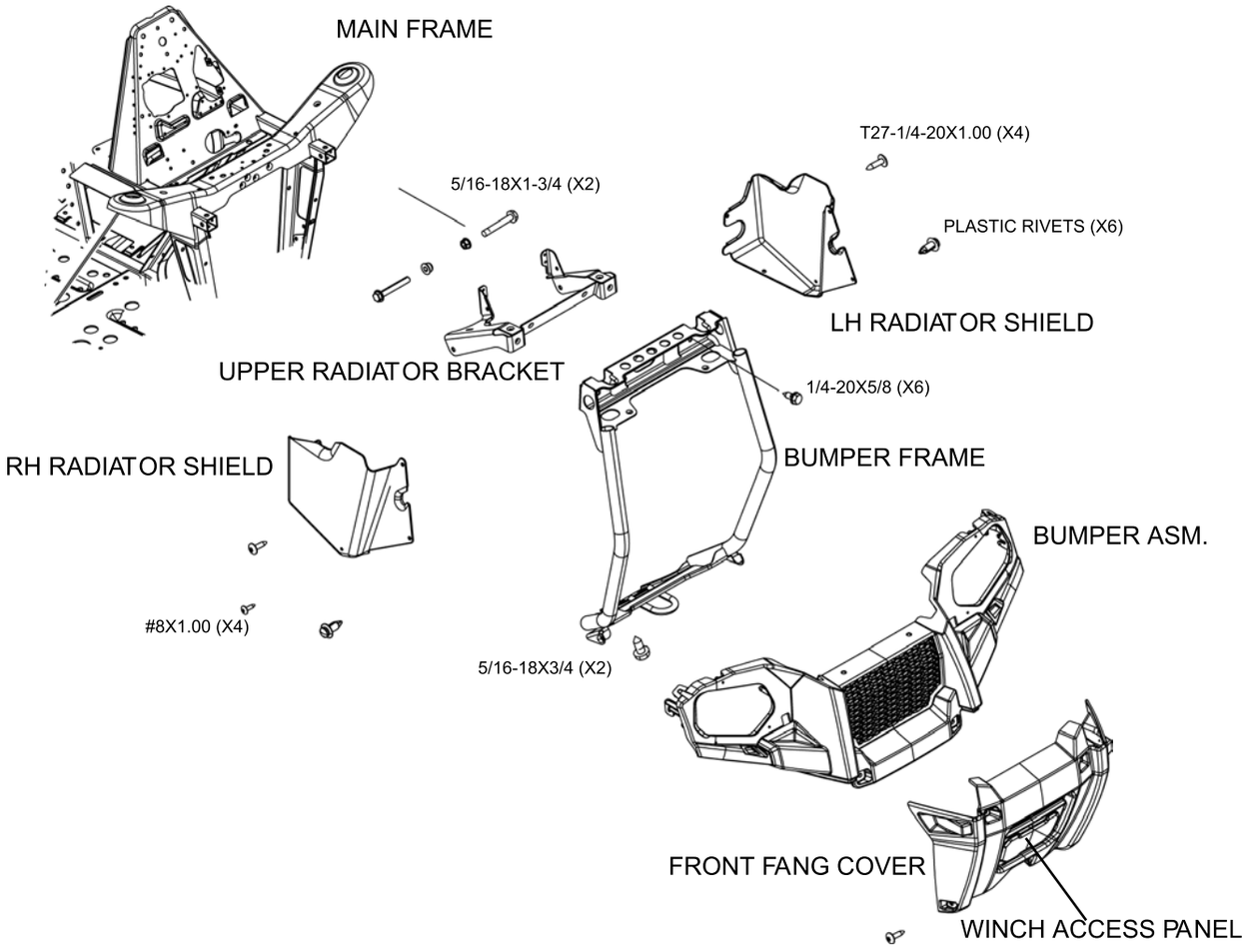
Front Bumper Assembly



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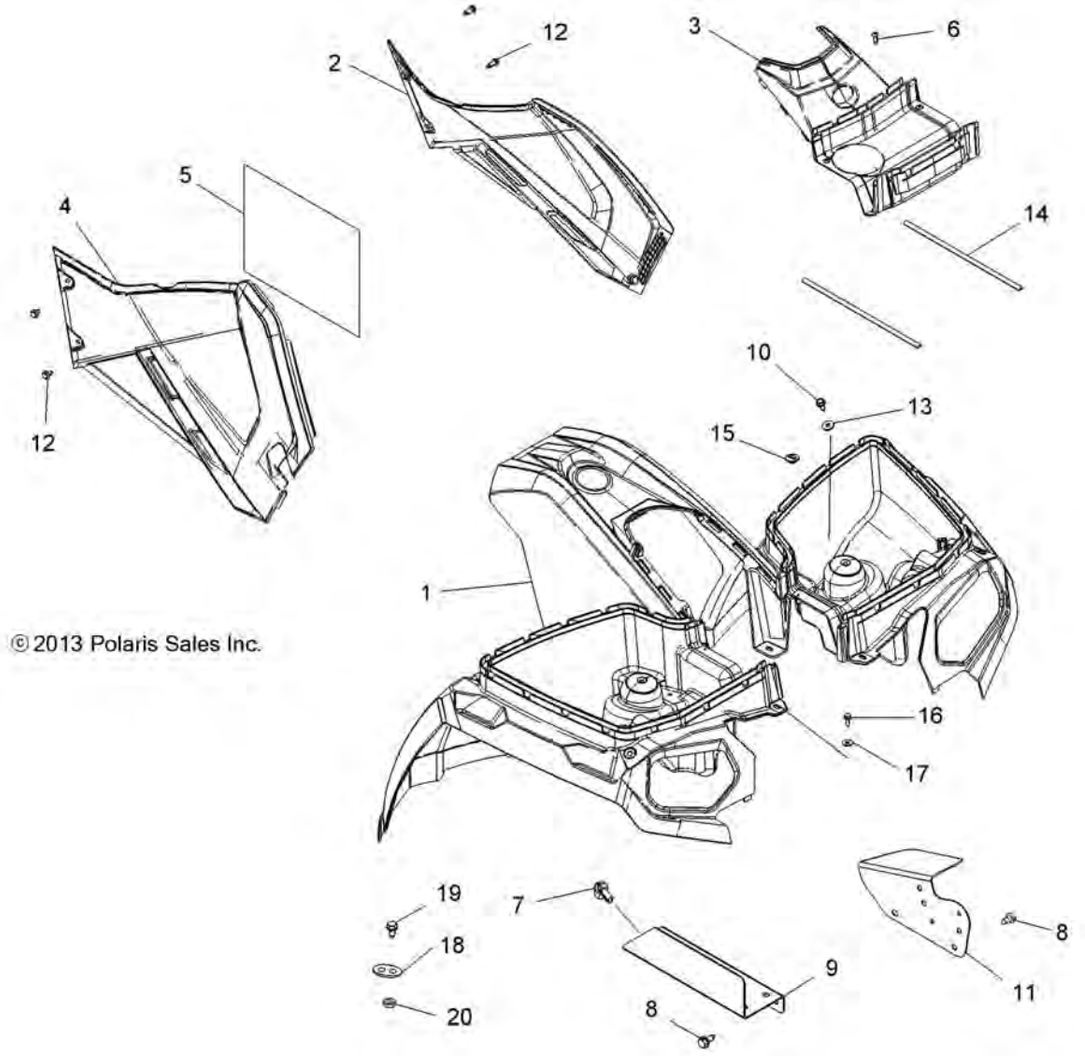
Front Cab Assembly



REF.	PART DESCRIPTION	NOTES
1	ASM., CAB, FRONT	
2	PANEL, SIDE, LH	
3	COVER, FRONT	
4	ASM., PANEL/FOIL, RH	
5	FOIL, SIDE PANEL	
6	SCREW	
7	CLIP	
8	SCREW	
9	GUARD, SPLASH, RH	
10	SCREW	
11	GUARD, SPLASH, LH	
12	RIVET	
13	WASHER, FLAT	
14	SEAL, BULB	
15	PLUG, COMPARTMENT	
16	SCREW	
17	WASHER, FLAT	
18	BRACKET, PLUG MOUNT	
19	BOLT, CARRIAGE	
20	NUT, FLANGED, NYLOK	

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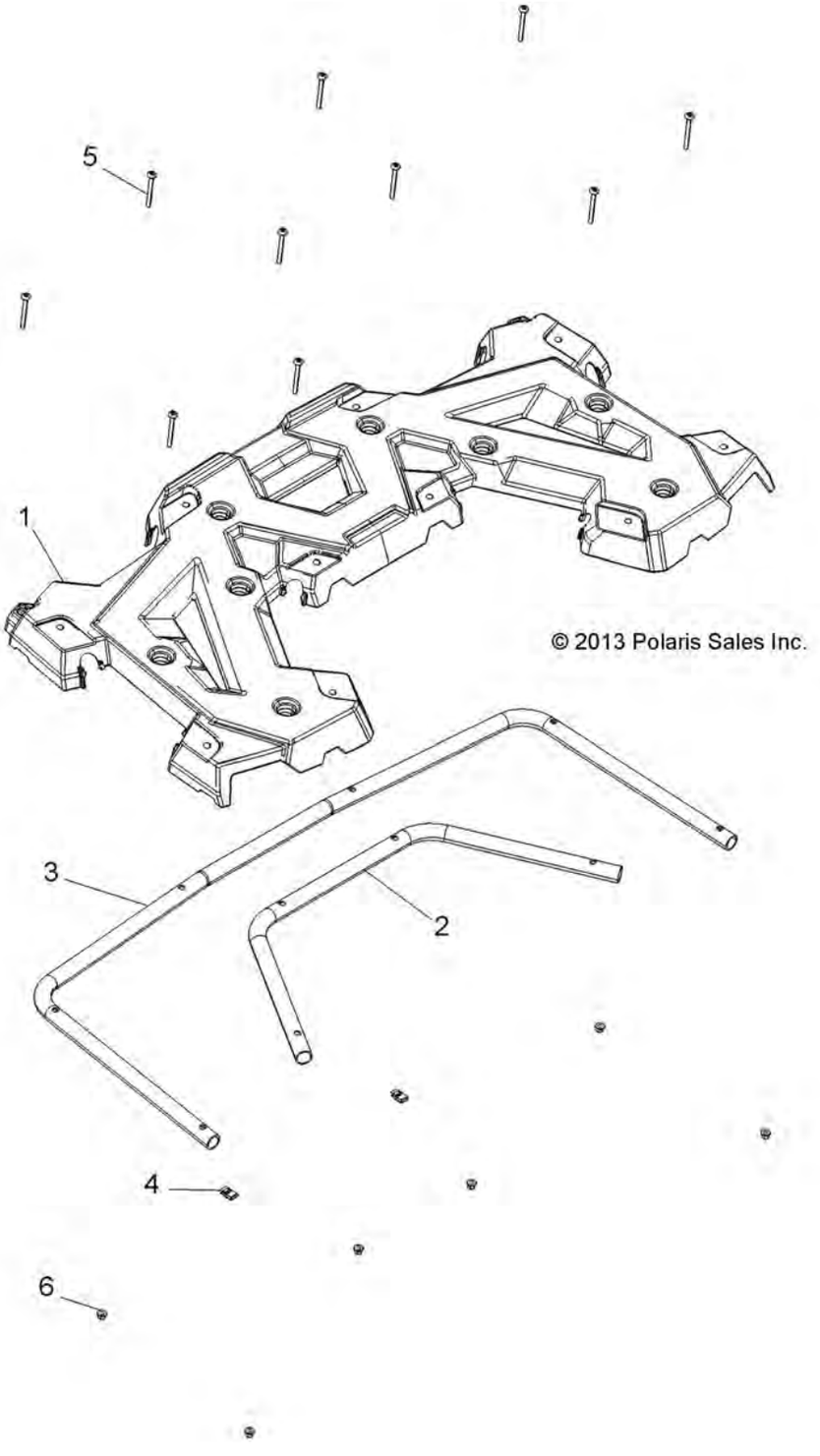
Rear Rack Assembly



REF.	PART DESCRIPTION	NOTES
1	ASM., RACK, REAR	
2	TUBE, SUPPORT, FRONT	
3	TUBE, SUPPORT, REAR	
4	CLIP, U SPEED NUT	
5	SCREW	
6	NUT, FLANGE, NYLOK	

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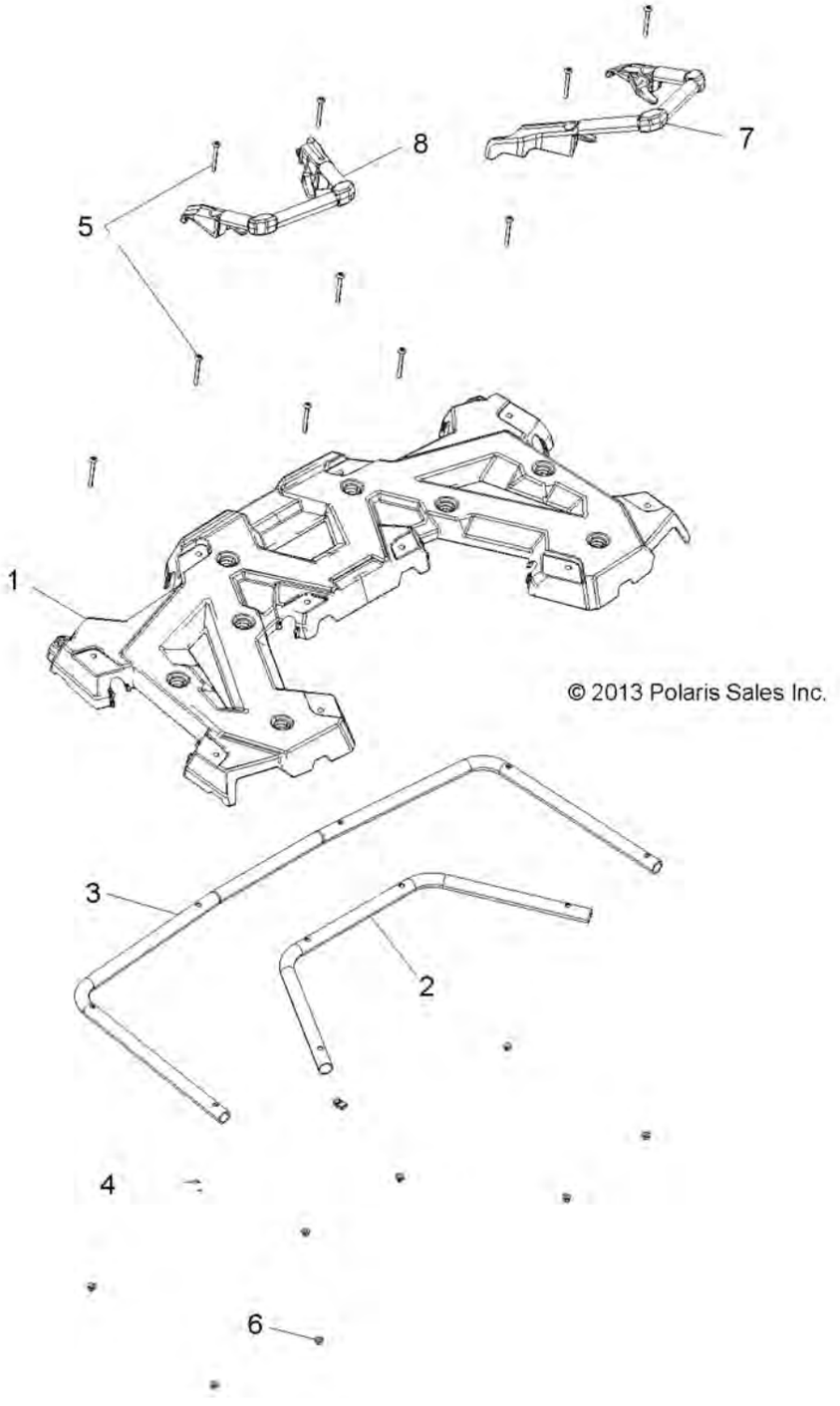
Touring Rear Rack and Hand Grips



REF.	PART DESCRIPTION	NOTES
1	ASM., RACK, REAR	
2	TUBE, SUPPORT, FRONT	
3	TUBE, SUPPORT, REAR	
4	CLIP, U SPEED NUT	
5	SCREW	Torque fastener until fully seated.
6	NUT, FLANGE, NYLOK	
7	ASM., HAND GRIP, PASSENGER, LH	
8	ASM., HAND GRIP, PASSENGER, RH	

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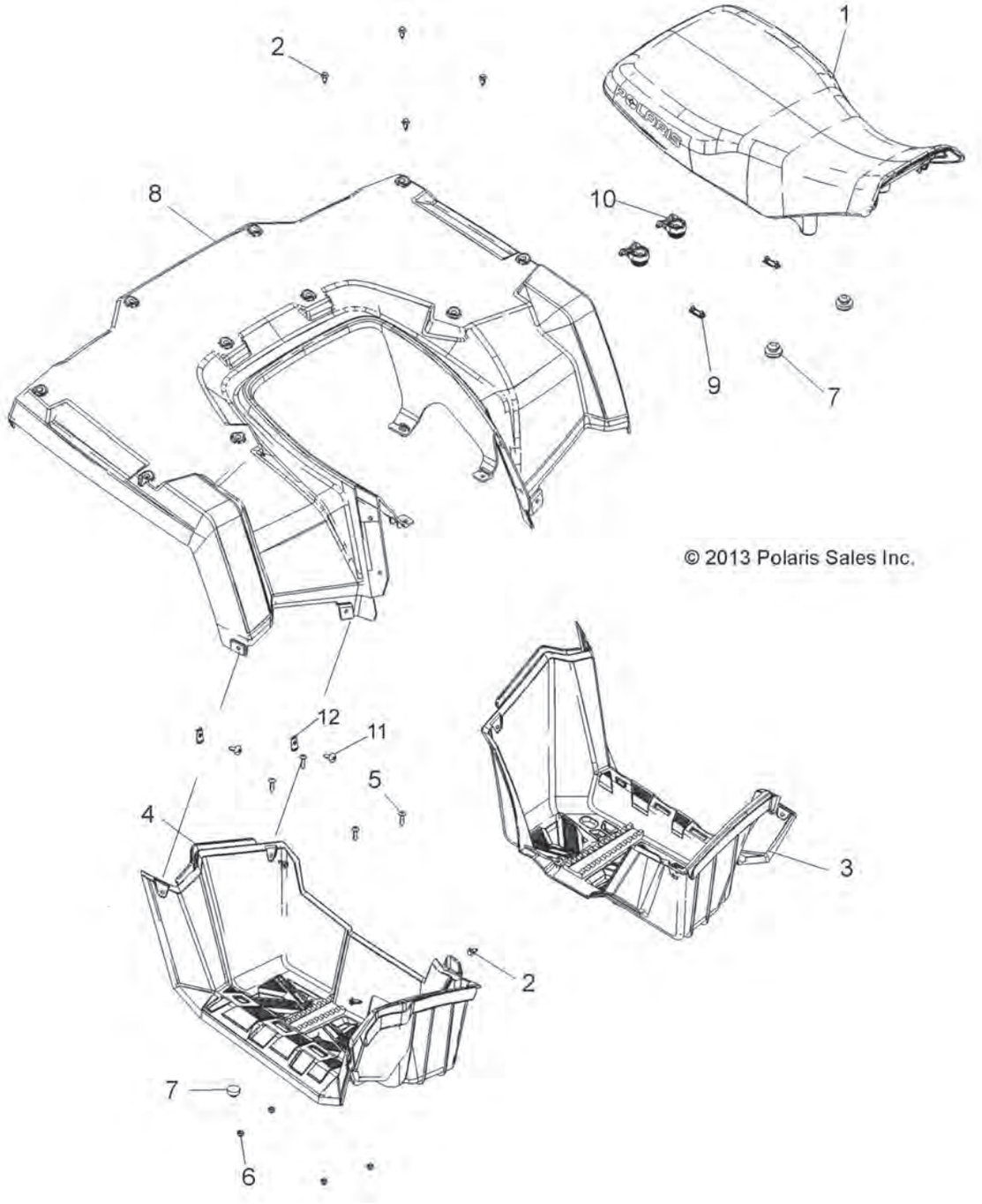
Rear Cab, Seat, And Footwell Assembly



REF.	PART DESCRIPTION	NOTE
1	ASM., SEAT,	
2	RIVET	
3	FOOTWELL, BLACK, LH	
4	FOOTWELL, BLACK, RH	
5	SCREW	
6	NUT, NYLOK	
7	BUMPER, RUBBER	
8	ASM., CAB, REAR	
9	BUMPER, SEAT	
10	GROMMET, SEAT LATCH	
11	SCREW	
12	NUT, U-TYPE	

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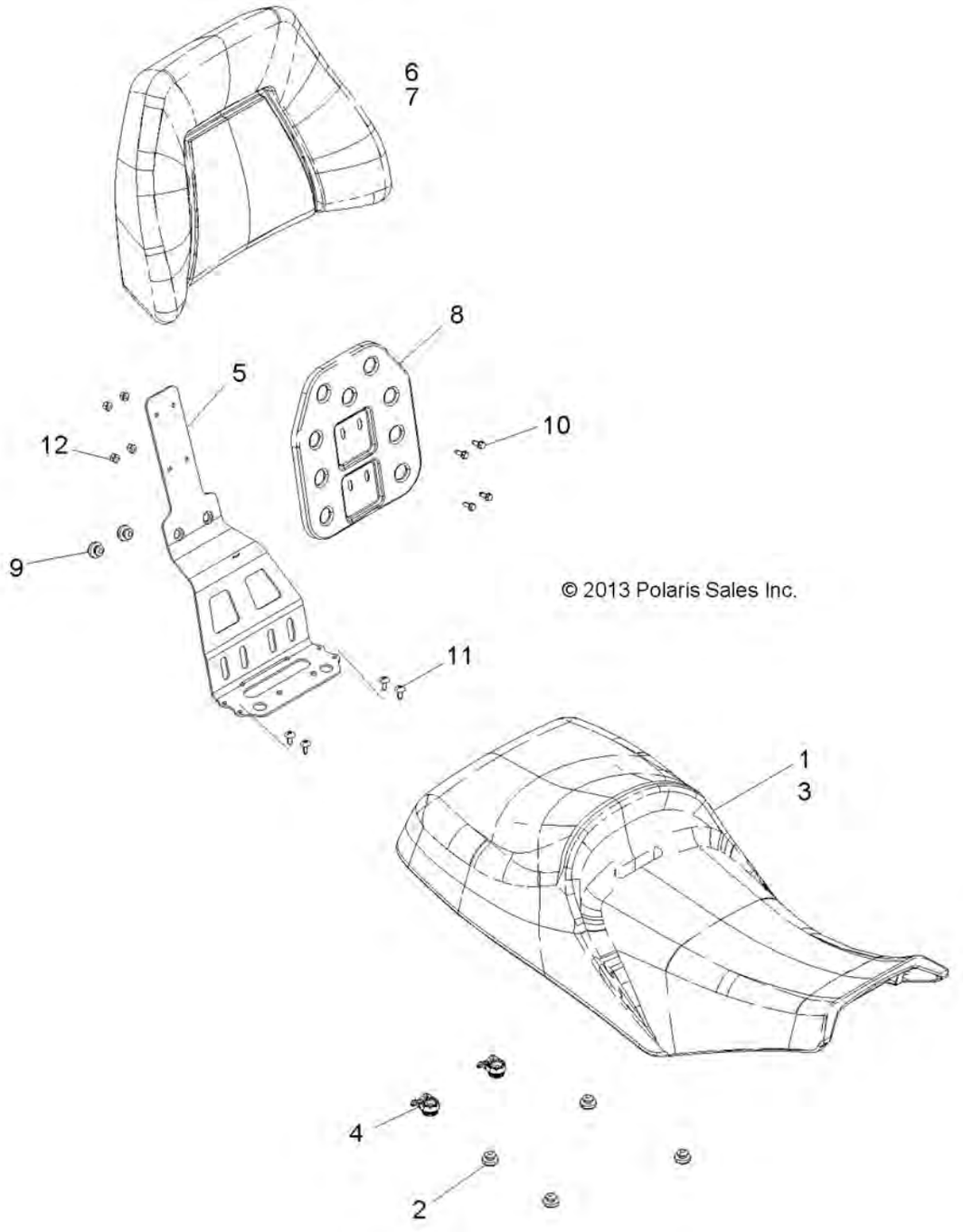
Touring Seat



REF.	PART DESCRIPTION	NOTE
1	ASM., SEAT, OPERATOR	
2	BUMPER, RUBBER	
3	ASM., COVER W/DECAL	
4	GROMMET, SEAT LATCH	
5	SUPPORT, SEAT BACK, BLACK	
6	ASM., PASSENGER SEAT BACK	
7	ASM., PASSENGER SEAT BACK COVER	
8	PLATE, SEAT BACK, SUPPORT	
9	BUMPER, RUBBER	
10	SCREW	
11	SCREW	
12	NUT, FLANGED, NYLOK	

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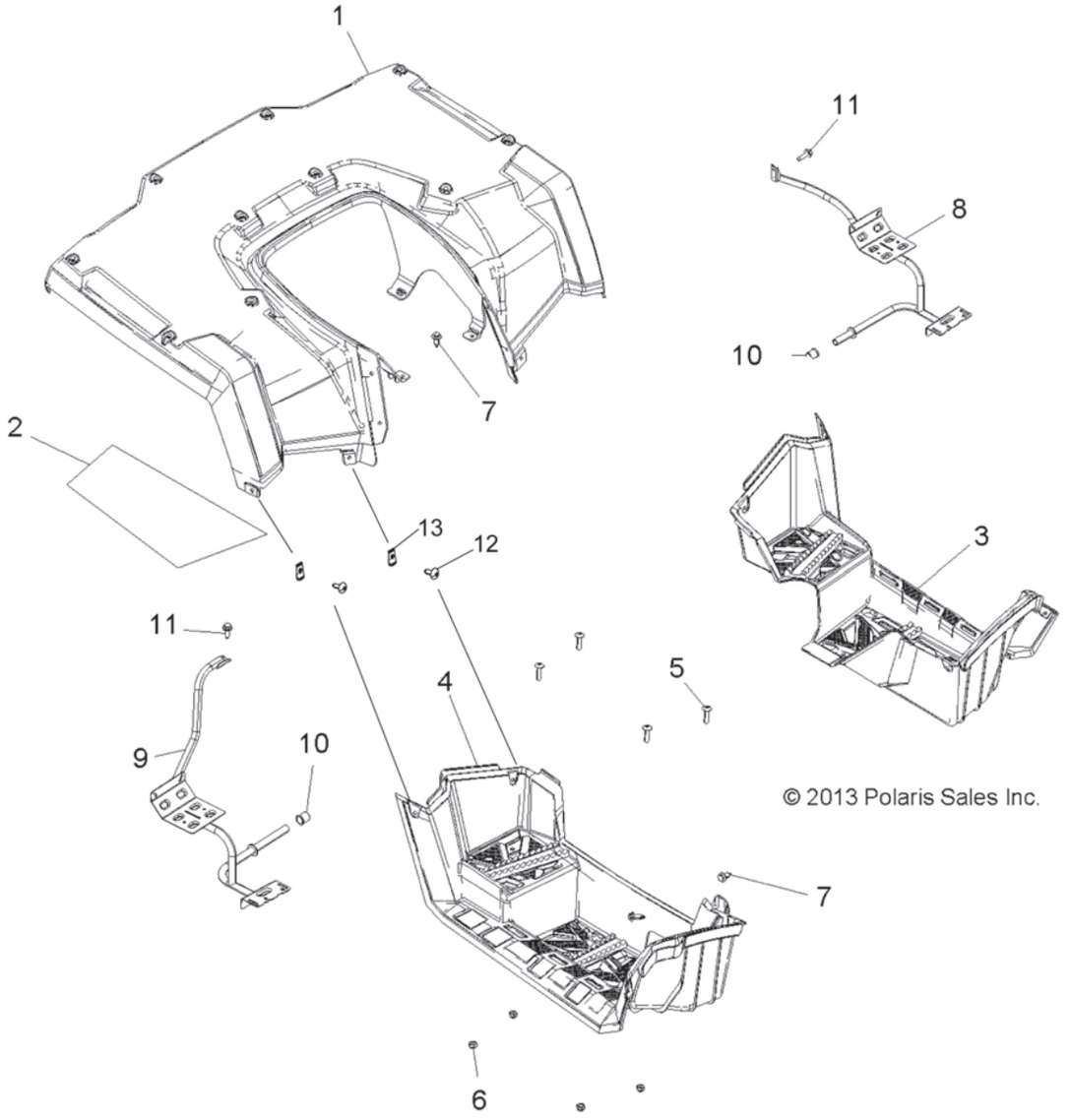
Touring Rear Cab and Footwells



REF.	PART DESCRIPTION	NOTE
1	ASM., CAB, REAR	
2	FOIL, CAB, REAR	
3	FOOTWELL, BLACK, LH	
4	FOOTWELL, BLACK, RH	
5	SCREW	Torque until full seated.
6	NUT, NYLOK	Torque until full seated.
7	RIVET	
8	FOOTWELL, PASSENGER, LH	
9	FOOTWELL, PASSENGER, RH	
10	BUSHING	
11	SCREW	
12	SCREW	
13	NUT, U-TYPE	

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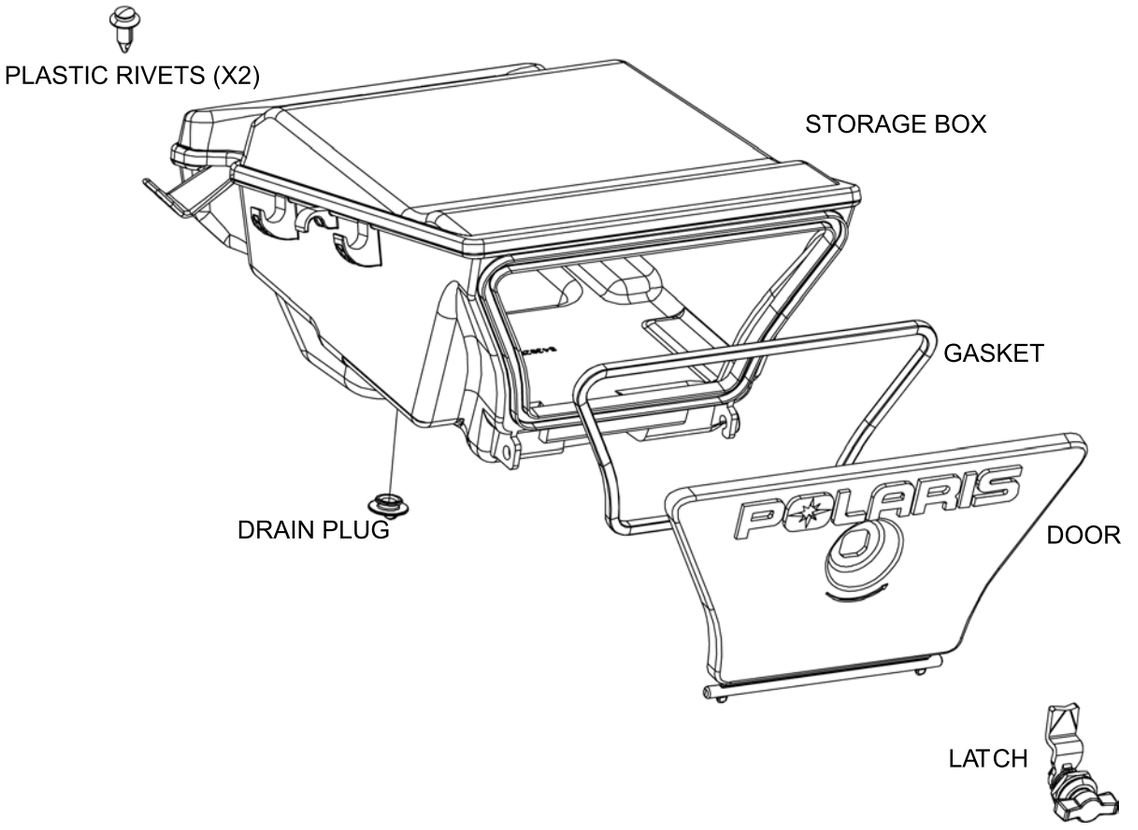
Rear Storage Box Assembly



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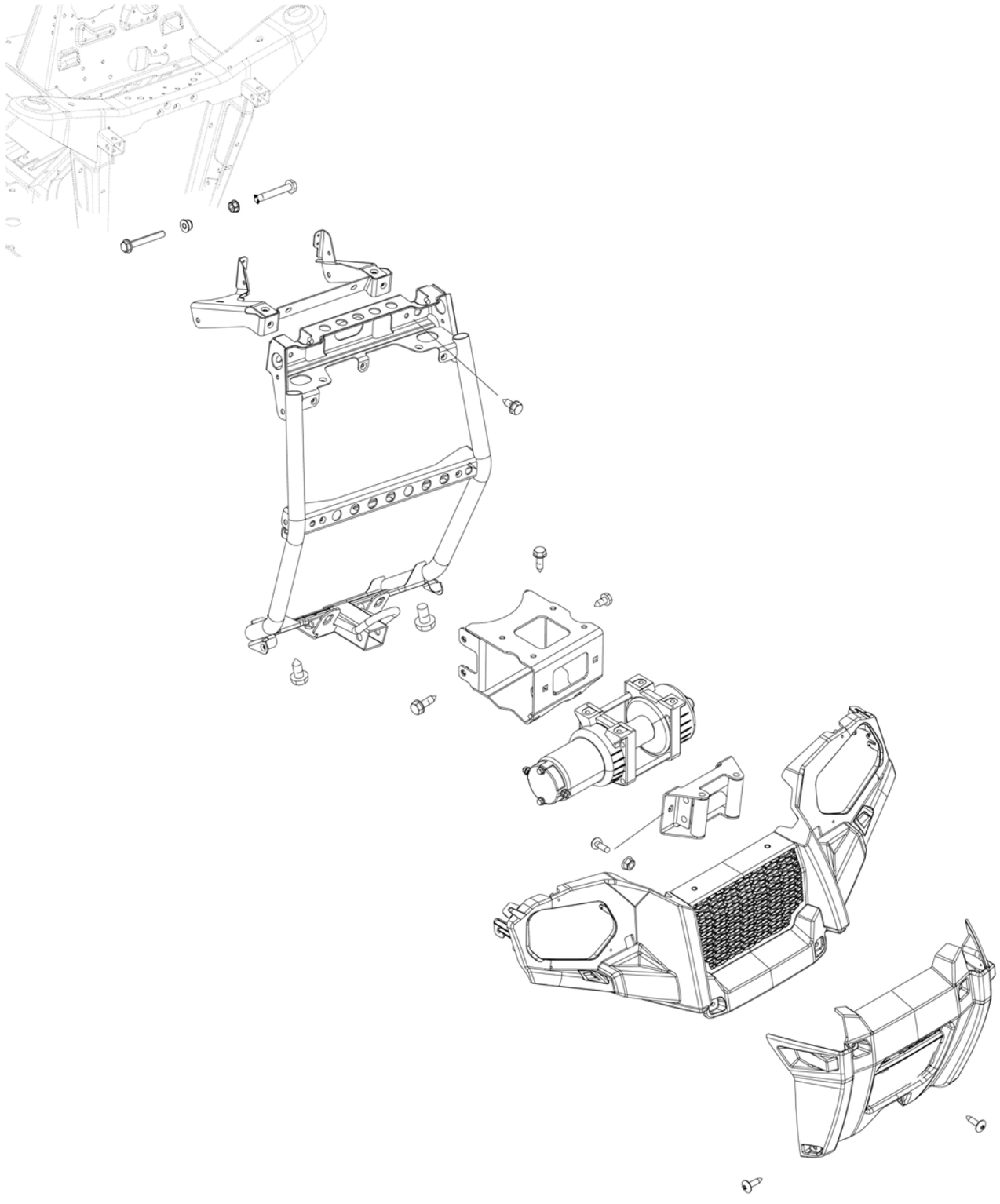
Winch and Front Bumper Mounting



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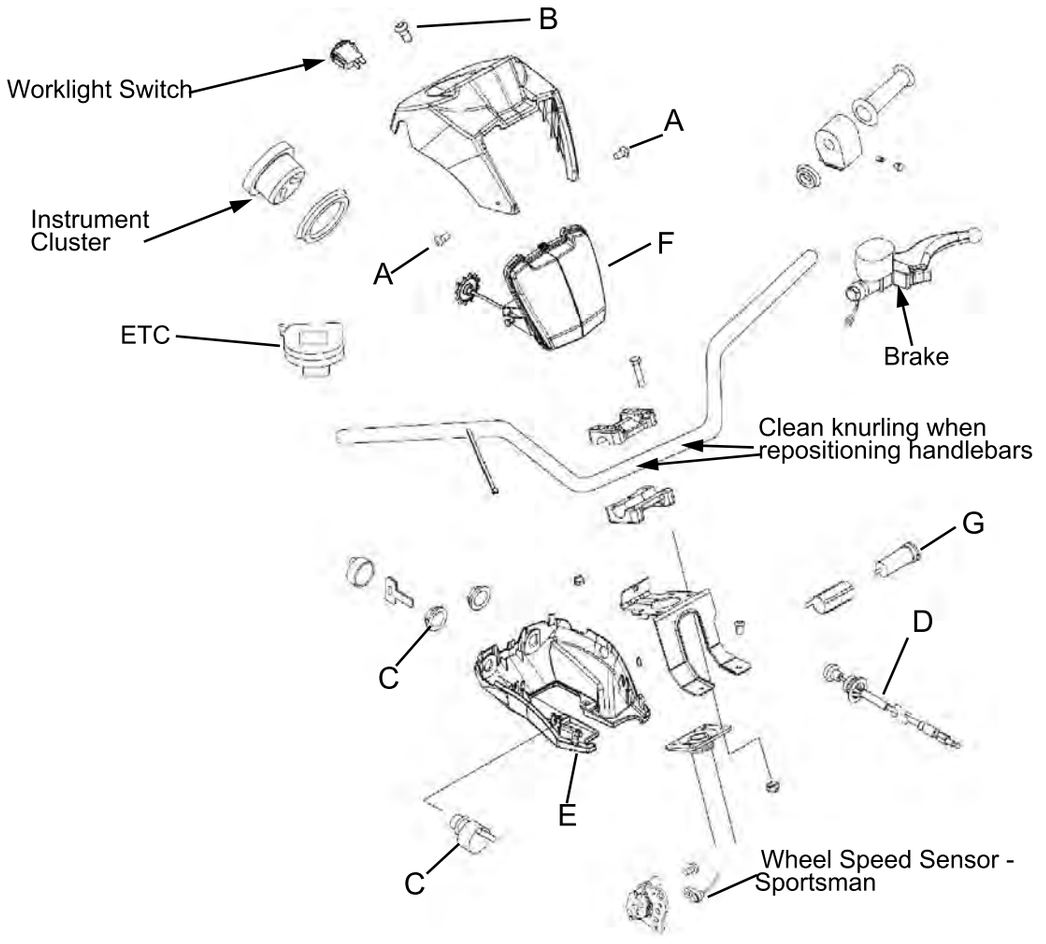
Headlight Pod Exploded View



Disassembly

- Remove two side Phillips screws (A)
- Remove one rear Phillips screw (B)
- Lift top half of pod
- Disconnect instrument cluster wire connectors
- Disconnect work light switch connector
- Disconnect 12Vdc power plug (G)
- Disconnect headlight harness
- Remove ignition switch (C) and choke cable (D)
- Remove headlight (F) with adjuster
- Remove two screws securing bottom half of pod (E)

Assembly

- Install bottom of pod onto handlebar and secure to brackets
- Install key switch, choke cable, and headlight
- Connect 12Vdc power outlet (where applicable)
- Connect headlight
- Connect instrument cluster connectors to instrument cluster
- Install top of pod onto bottom half, making sure interlocking tabs mate properly
- Install two side Phillips screws
- Install one rear Phillips screw
- To adjust headlight, refer to procedure outlined in Chapter 2

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STEERING POST AND LOCK (INTL.)

Steering Assembly Exploded View

International units are equipped with a steering locking mechanism to prevent theft or unauthorized use. Refer to the standard torque specifications chart in Chapter 1 whenever servicing the steering lock components.

Lock System / Description

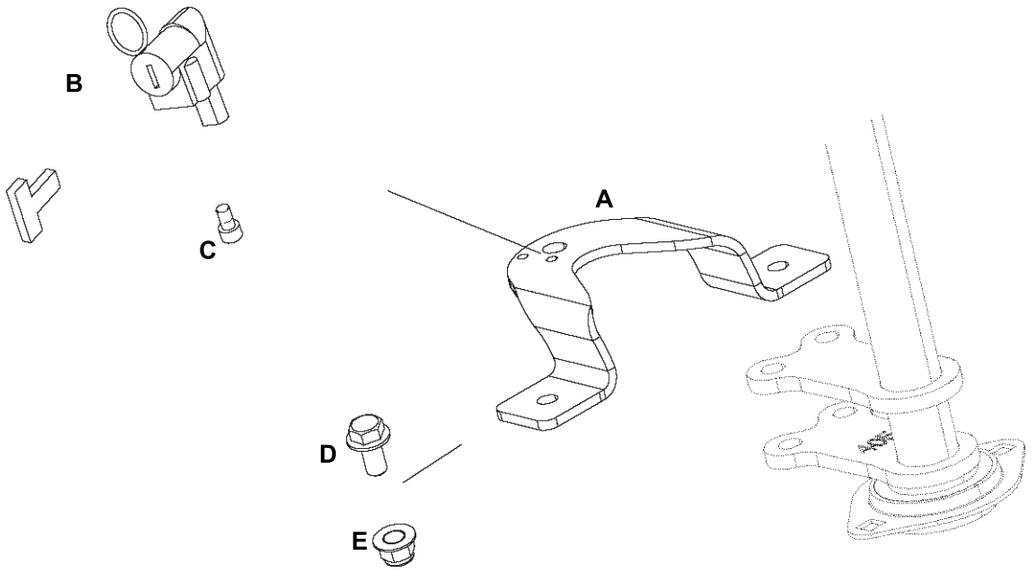
A. Lock Collar

B. Lock Set

C. Bolt, Lock Set

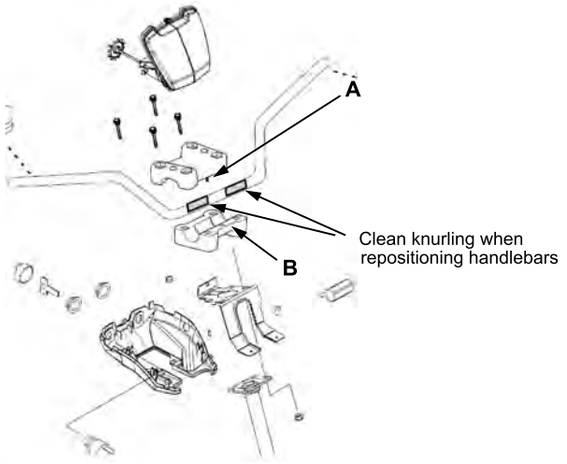
D. Bolt(s), Lock Collar

E. Nut(s), Lock Collar



STEERING

Handlebar Block Installation Procedure



1. The pin (A) on the bottom side of the top handlebar block faces down and to the front of the ATV.
2. The bottom handle bar block has a side with 3 holes, the side with 3 holes faces up and to the front of the ATV.
3. Align the pin (A) in the top block with the middle hole (B) in the bottom block for proper installation. The pin (A) and middle hole (B) should face the front of the ATV.
4. Install the pin side bolts first and evenly tighten the bolts down. Evenly torque the 2 front bolts to specification.

= T
Handle Bar Bolt: **14 ft-lbs (19 Nm)**

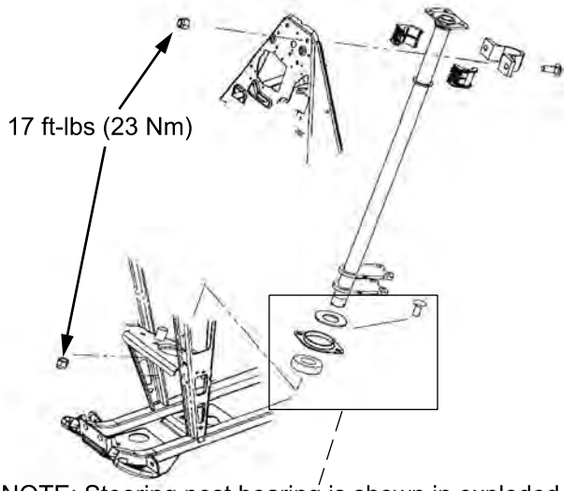
5. Install the rear bolts and tighten evenly. Evenly torque the 2 rear bolts to specification.

   NOTE: There will be a slight gap on the backside of the blocks after the procedure is performed.

Steering Post Removal

1. Remove the front cab.
2. Remove the handle bar pod.
3. Remove the handle bar.
4. Remove the fuel tank bracket assembly.
5. Remove the steering tie rod ends from the steering bracket. Note the orientation of the fasteners and bracket on the steering assembly.
6. Remove the steering post nuts at the mount plate.
7. Remove the top steering bracket.
8. Remove the steering post.

Steering Post Assembly



NOTE: Steering post bearing is shown in exploded view form. This bearing is attached to the post using a radial riveting method and is a non-serviceable item. Steering post replacement is required in the event of a bearing failure.

1. Install the steering post.
2. Install the steering post nuts at the mount plate.
3. Install the top steering bracket.
4. Torque all fasteners to specification.
5. Install the steering tie rod ends from the steering bracket, noting the orientation of the fasteners and bracket on the steering assembly.
6. Install the fuel tank bracket, handle bar and pod. Torque fasteners to specification.
7. Check the steering, the handle bars must move freely and easily from full left to full right without binding.
8. Install front cab.

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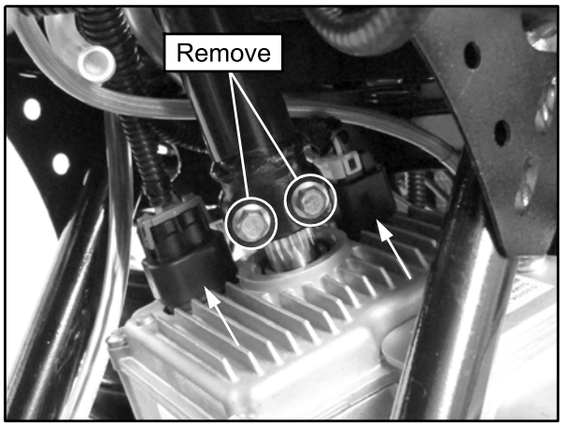
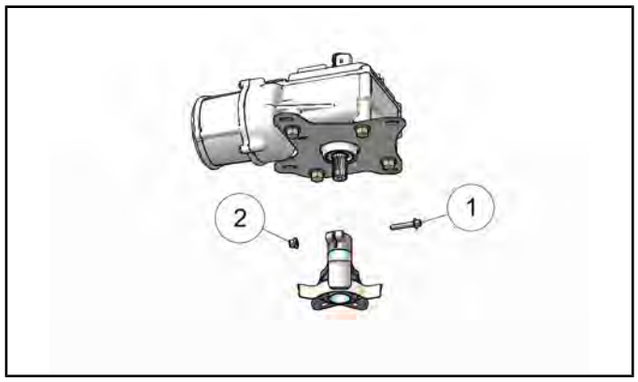
EPS Unit Removal (EPS Models)

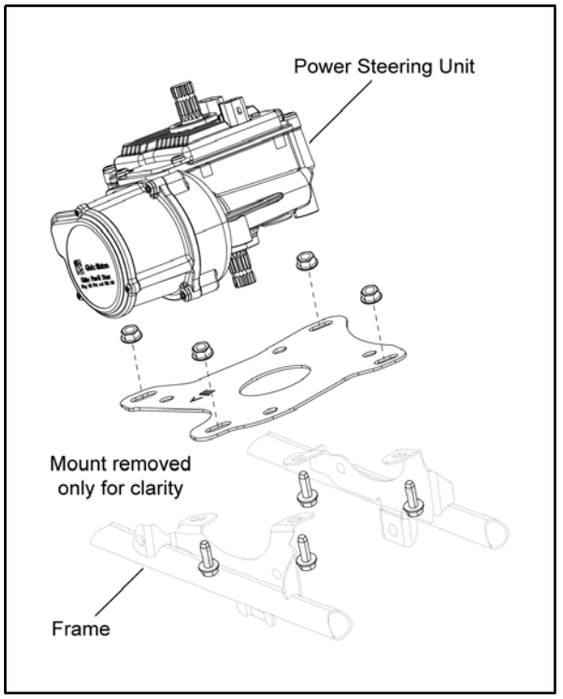
1. Remove the front rack or front storage box and front cover.
2. Remove both front mud guards, upper side panels, front cab and right-hand footwell .
3. Remove the fuel tank.
4. Remove the pinch bolts retaining the upper steering post to the power steering unit.



NOTE: Some models, feature a lower steering shaft pinch bolt (1 and 2). Remove pinch bolt.



5. Disconnect the (2) electrical harnesses from the power steering unit.
6. Remove the fasteners retaining the upper steering post bushing bracket.
7. Lift the upper steering post up from the power steering unit.
8. Remove the (4) mounting fasteners that retain the power steering unit and mount plate to the frame.



9. Carefully lift the power steering unit up to disengage the lower steering coupler and remove it from the chassis.

EPS Unit Installation (EPS Models)

1. Position the vehicle so the front wheels are pointing straight forward.
2. Clean the lower steering post so the alignment mark is visible. Mark the skip tooth spline on the lower power steering shaft.
3. Apply anti-seize to the shaft splines to aid assembly.

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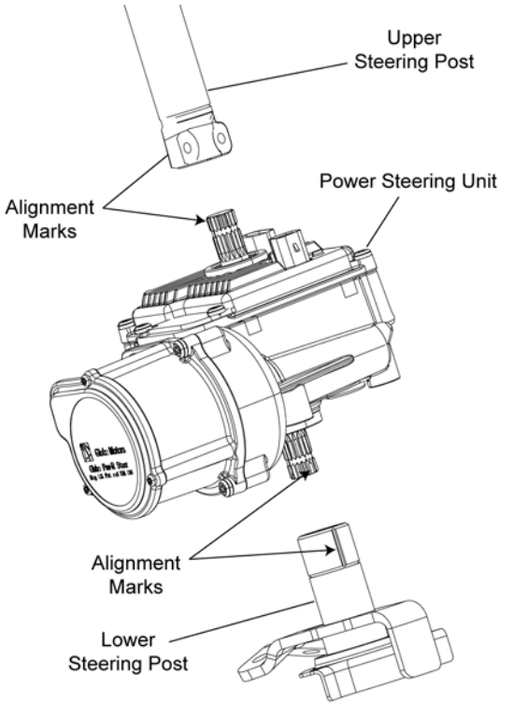
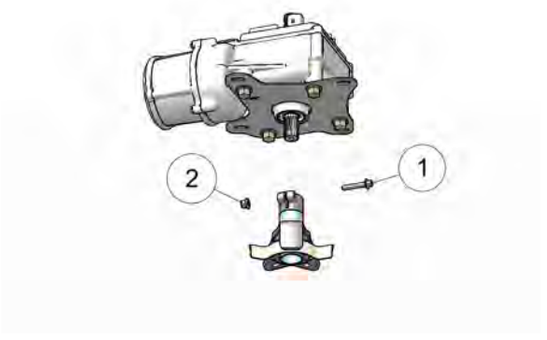
4. Align the two marks and install the power steering unit.



= T
Lower Steering Post Pinch Bolt: **15 ft-lbs (20 Nm)**

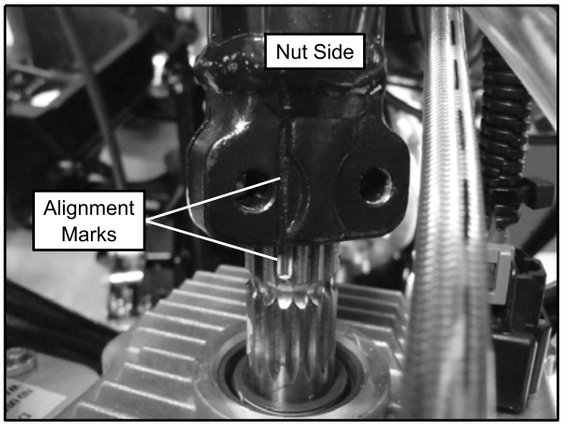
NOTE: Some models feature a lower steering post pinch bolt (1 and 2). Install pinch bolt and torque to specification.



5. Install the (4) mount plate fasteners by hand, but do not torque fasteners at this time.

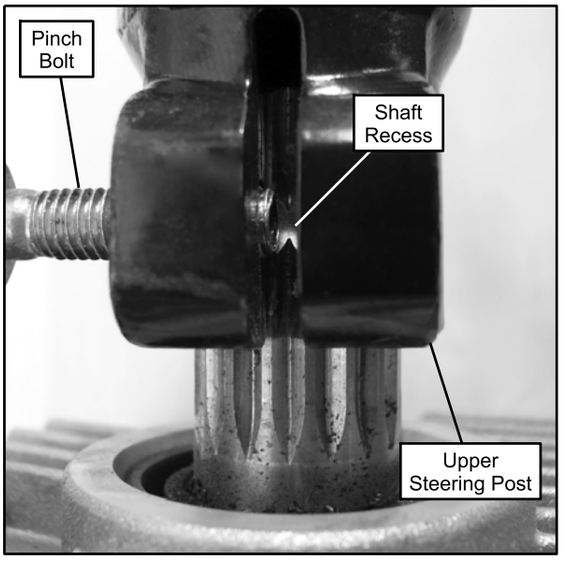
6. Reconnect the (2) electrical harnesses to the power steering unit.

7. Align the mark on the upper steering post (nut side) with the skip tooth spline on the upper power steering shaft upon installation.



NOTE: Apply anti-seize to the shaft splines to aid assembly.

8. Position the upper steering post on the shaft so the pinch bolts are aligned with the recess in the power steering shaft.



CAUTION
Striking the steering post can permanently damage the EPS unit and cause a Power Steering Fault.

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9. Install the pinch bolts and torque to specification. Refer to “Steering Exploded View (EPS Models)”.

= T
Upper Steering Post Pinch Bolts: **15 ft-lbs (20 Nm)**

10. Torque the power steering mount plate fasteners to specification. Refer to “Steering Exploded View (EPS Models)”.
11. Install the fuel tank assembly, fuel line and reconnect the fuel pump harness.
12. Reinstall the upper steering post bushing bracket and torque the (2) fasteners to specification.

= T
Steering Post to Bulkhead Bolts: **20 ft-lbs (27 Nm)**

13. 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. If binding occurs:
    - Loosen the (4) mounting fasteners
    - Move handlebars from left to right several times to position the power steering unit
    - Torque the (4) mounting fasteners to specification. Refer to “Steering Exploded View (EPS Models)”
    - Check the steering operation for binding again
    - If no binding is present, proceed; if binding is still present, repeat this procedure
14. Install front mud guards, upper side panels, front cab (if removed) and right-hand footwell.
15. Install the front cover and front rack or storage box.

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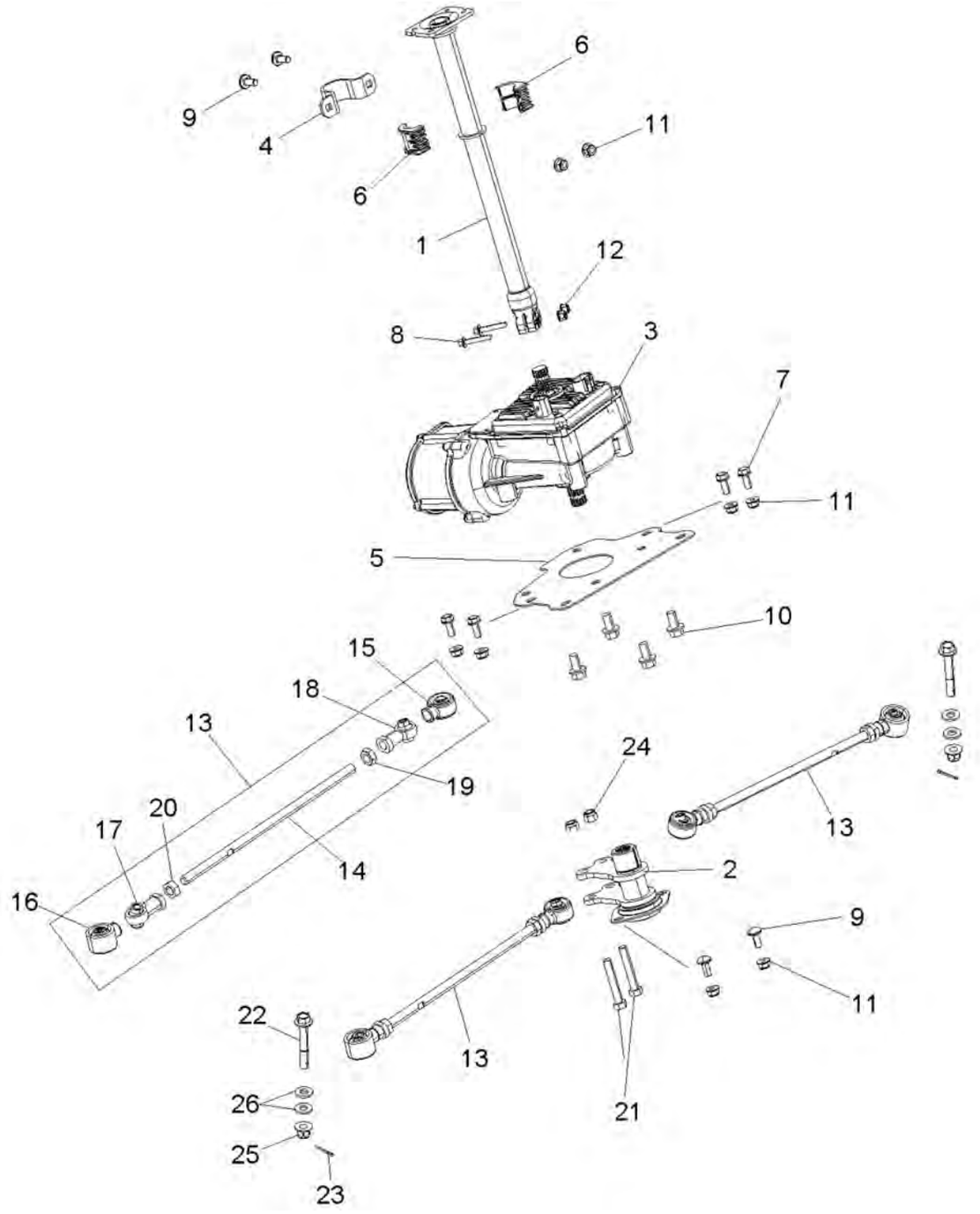
Steering Exploded View (EPS Models)



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REF.	PART DESCRIPTION	NOTE
1	POST, STEERING, UPPER	
2	ASM., STEERING POST	
3	ASM., POWER STEERING	
4	BRACKET, UPPER STEERING BUSHING	
5	PLATE, MOUNT, POWER STEERING	
6	BUSHING, UPPER STEERING	
7	SCREW	
8	SCREW	
9	BOLT, CARRIAGE	
10	BOLT	30 ft-lbs ± 10% (41 Nm ± 10%)
11	NUT, FLANGE, NYLOK	18 ft-lbs ± 10% (24 Nm ± 10%) ; 20 ft-lbs ± 10% (27 Nm ± 10%) at joint attaching EPS mount to frame
12	NUT, FLANGE, NYLOK	14 ft-lbs ± 10% (19 Nm ± 10%)
13	ASM., TIE ROD	
14	ROD, TIE	
15	BOOT, SEAL, ROD END	
16	BOOT, SEAL, ROD END	
17	ROD, END	
18	ROD, END	
19	NUT	
20	NUT, LH, JAM	
21	SCREW	
22	BOLT	
23	PIN, COTTER	
24	NUT, NYLOK	
25	NUT, FLANGE, NYLOK	
26	WASHER, FLAT	

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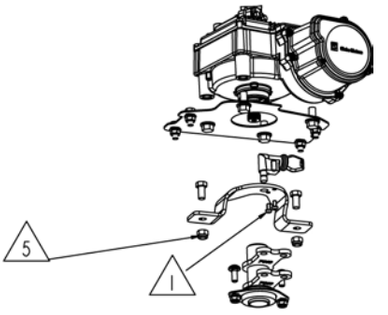
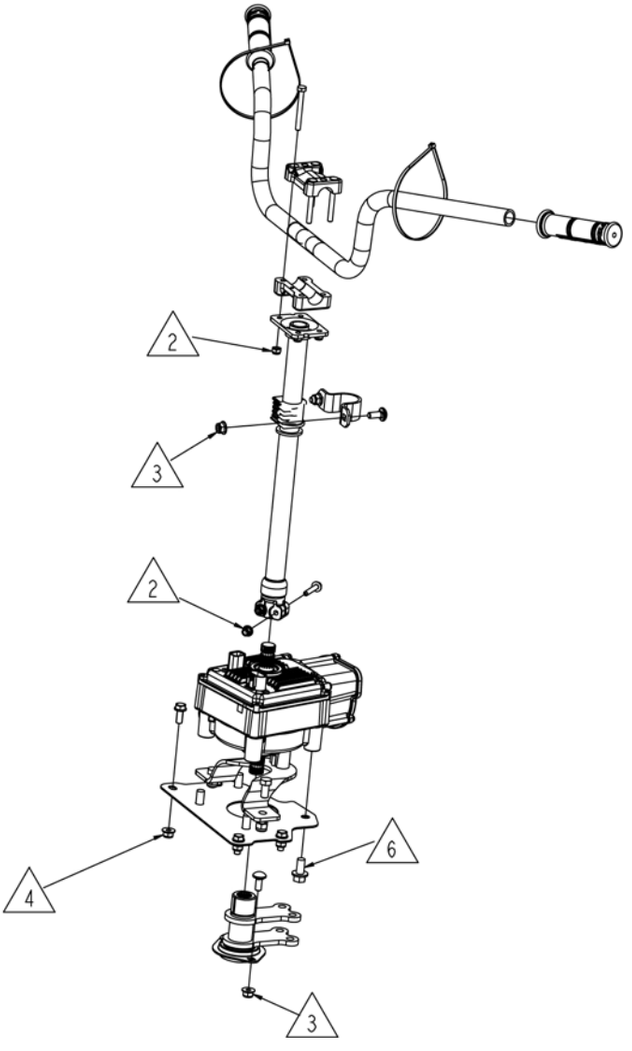
NOTES:

1. TORQUE FASTENERS INDICATED TO 16 IN-LBS ± 10% IN-LBS.
2. TORQUE FASTENERS INDICATED TO 14 FT-LBS ± 10% FT-LBS.
3. TORQUE FASTENER INDICATED TO 18 FT-LBS ± 10% FT-LBS.
4. TORQUE FASTENER INDICATED TO 20 FT-LBS ± 10% FT-LBS.
5. TORQUE FASTENER INDICATED TO 26 FT-LBS ± 10% FT-LBS.
6. TORQUE FASTENER INDICATED TO 30 FT-LBS ± 10% FT-LBS.





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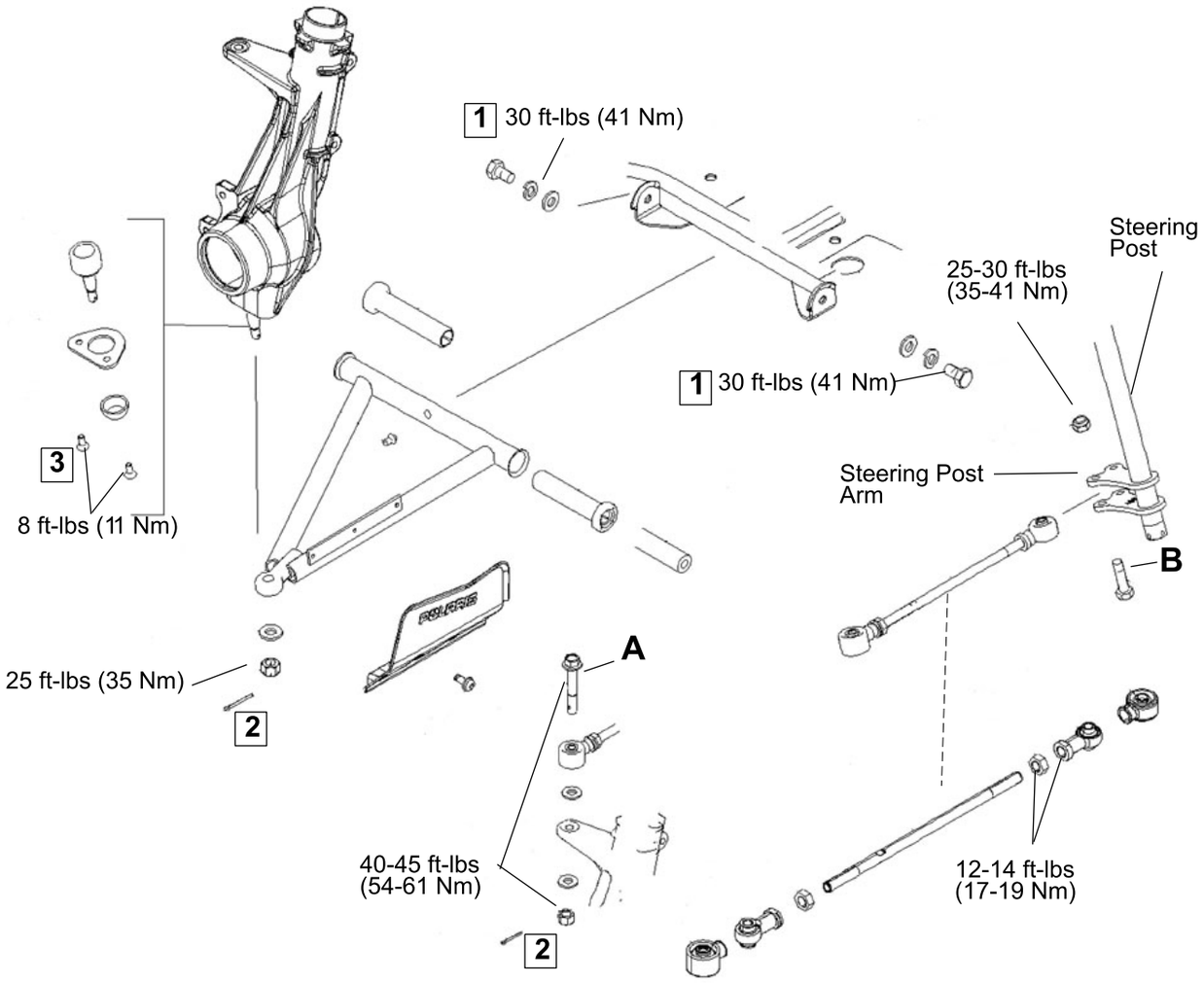
SUSPENSION

Steering / A-arm Exploded View

NOTE: To avoid damage to tie rods and other steering components, be sure to install tie rod end bolts in the proper direction. The steering post arm bolt (B) points up; the rod end bolts (A) point down. Verify inner rod ends are placed between the steering post arms.



1 Always use new bolts upon reassembly.

2 Always use new cotter pins upon reassembly. Install with open end toward rear of machine.

3 Apply Loctite® 242 to bolt threads.

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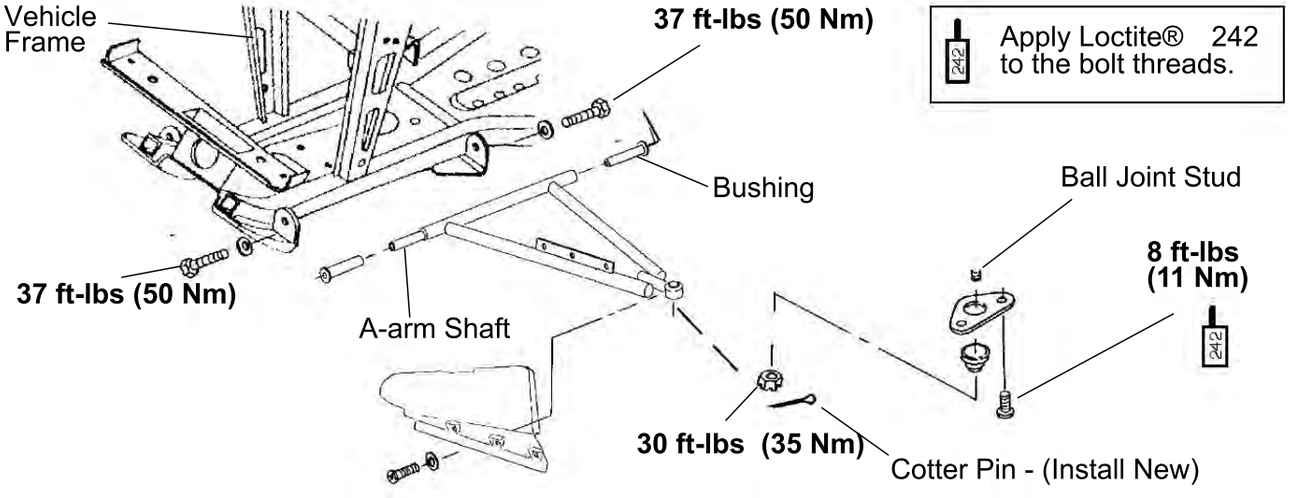
A-Arm Replacement



1. Elevate and safely support vehicle with weight removed from front wheel(s).
2. Remove cotter pin from ball joint stud at wheel end of A-arm and loosen nut until it is flush with end of stud.
3. Using a soft face hammer, tap nut to loosen A-arm from bolt. Remove nut and A-arm from hub strut assembly.
4. Loosen two bolts on A-arm tube by alternating each about 1/3 of the way until A-arm can be removed.
5. Examine A-arm shaft. Replace if worn. Discard hardware.
6. Insert A-arm shaft into new A-arm.
7. Install CV joint shields.
8. Install new A-arm assembly onto vehicle frame. Torque new bolts to specification.

= T
A-Arm Bolt: **37 ft-lbs (50 Nm)**

WARNING

The locking features on the existing bolts were destroyed during removal. DO NOT reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

9. Attach A-arm to hub strut assembly. Tighten ball joint nut to specification. If cotter pin holes are not aligned, tighten nut slightly to align. Install a new cotter pin with open ends toward rear of machine. Bend both ends in opposite directions around nut.

= T
Ball Joint Nut: **30 ft-lbs (41 Nm)**

WARNING

Upon A-arm installation completion, test vehicle at low speeds before putting into regular service.

Ball Joint Replacement

NOTE: Refer to the illustration on the previous page for this procedure.

1. Loosen front wheel nuts slightly.
2. Elevate and safely support machine under footrest/ frame area.

CAUTION

Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure.

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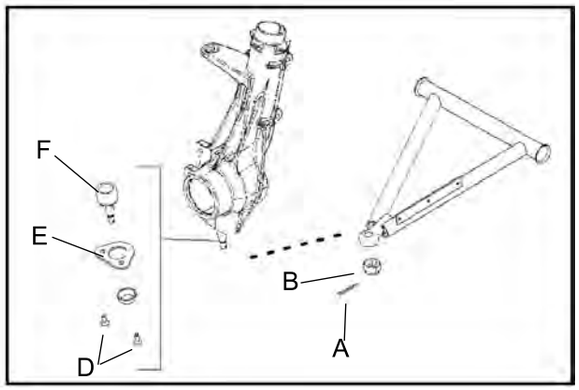
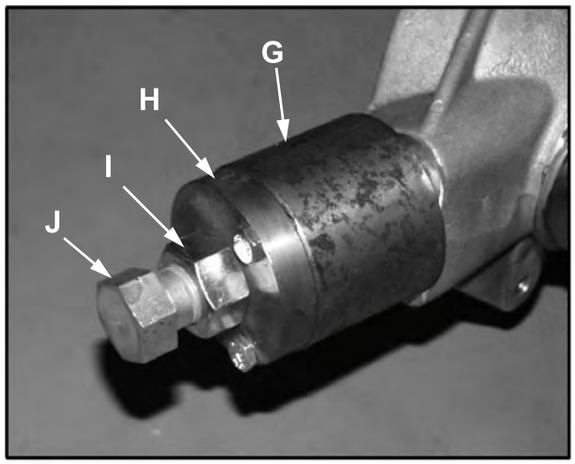
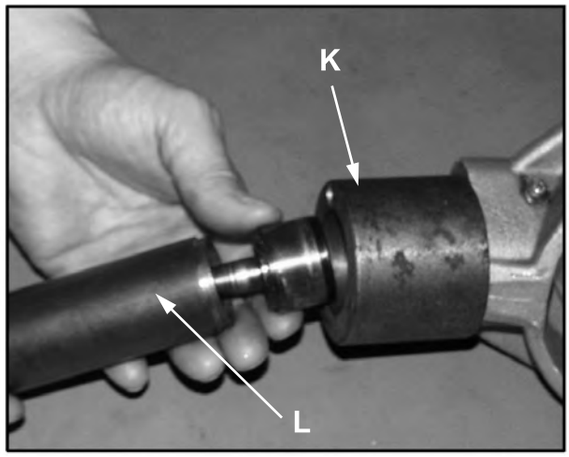
3. Remove wheel nuts and wheels.



4. Remove cotter pin (A) from ball joint castle nut (B).
5. Remove castle nut (B) and separate A-arm (C) from ball joint stud.
6. Remove screws (D) and ball joint retaining plate (E).
7. Use the Ball Joint Replacement Tool (PN 2870871), *remove* ball joint (F) from strut housing. Refer to photos.



8. Install puller guide (G) with extension cap (H).
9. Apply grease to extension cap and threads of puller bolt to ease removal.
10. Thread bolt (J) with nut (I) onto ball joint stud as shown.
11. Apply heat to ease removal.
12. Hold bolt (J) and turn nut (I) clockwise until ball joint is removed from strut housing.



13. To *install* a new ball joint, Remove extension cap and attach puller guide using short bolts provided in the kit.
14. Remove extension cap and attach puller guide using short bolts provided in the kit.
15. Insert new ball joint (K) into driver (L).
16. Slide ball joint/driver assembly into guide.
17. Apply heat to ease installation.
18. Drive new joint into strut housing until fully seated.
19. Apply Loctite™ 242 **(PN 2871949)** to threads of retaining plate screws or install new screws with pre-applied locking agent. Torque screws to specification.

= T
Retaining Screws: **8 ft-lbs (11 Nm)**

20. Install A-arm on ball joint and torque castle nut to specification.

= T
Castle Nut: **30 ft-lbs (41 Nm)**

21. Reinstall cotter pin with open ends toward rear of machine.

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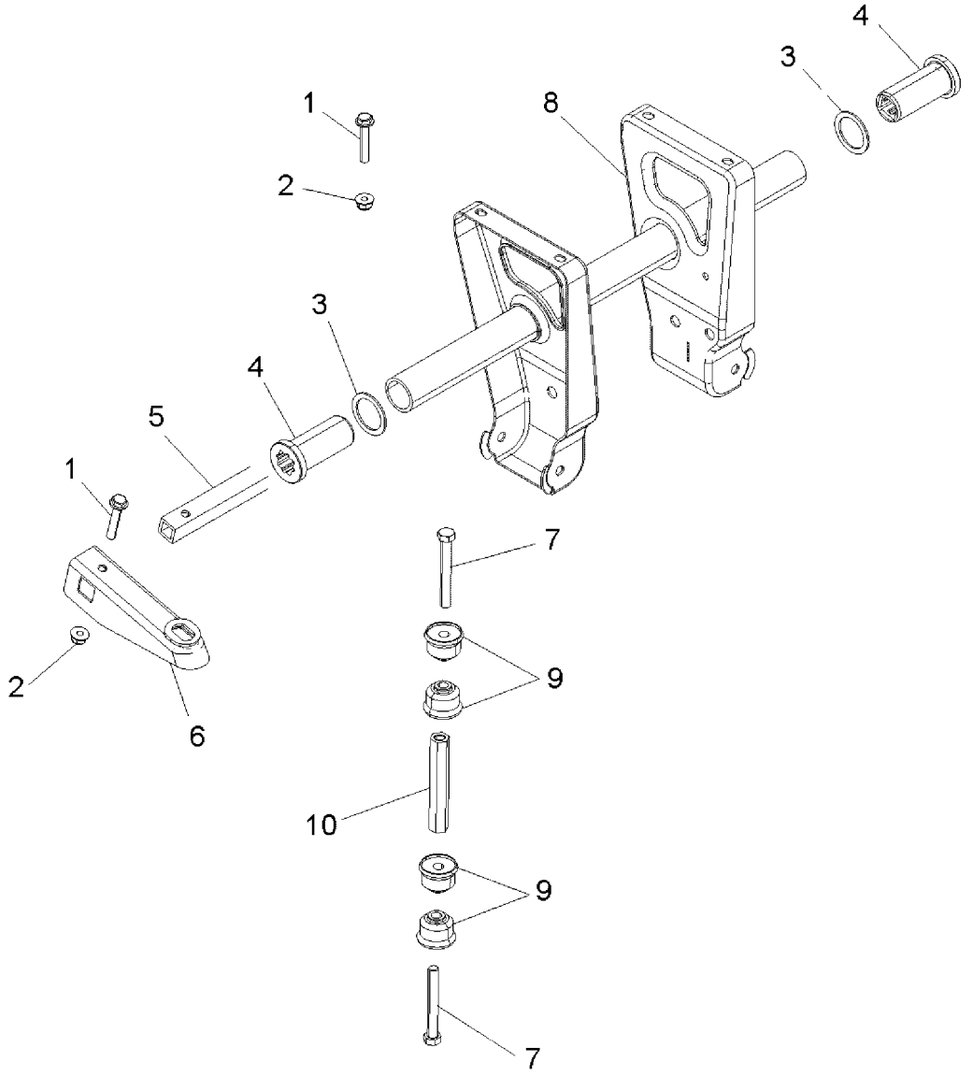
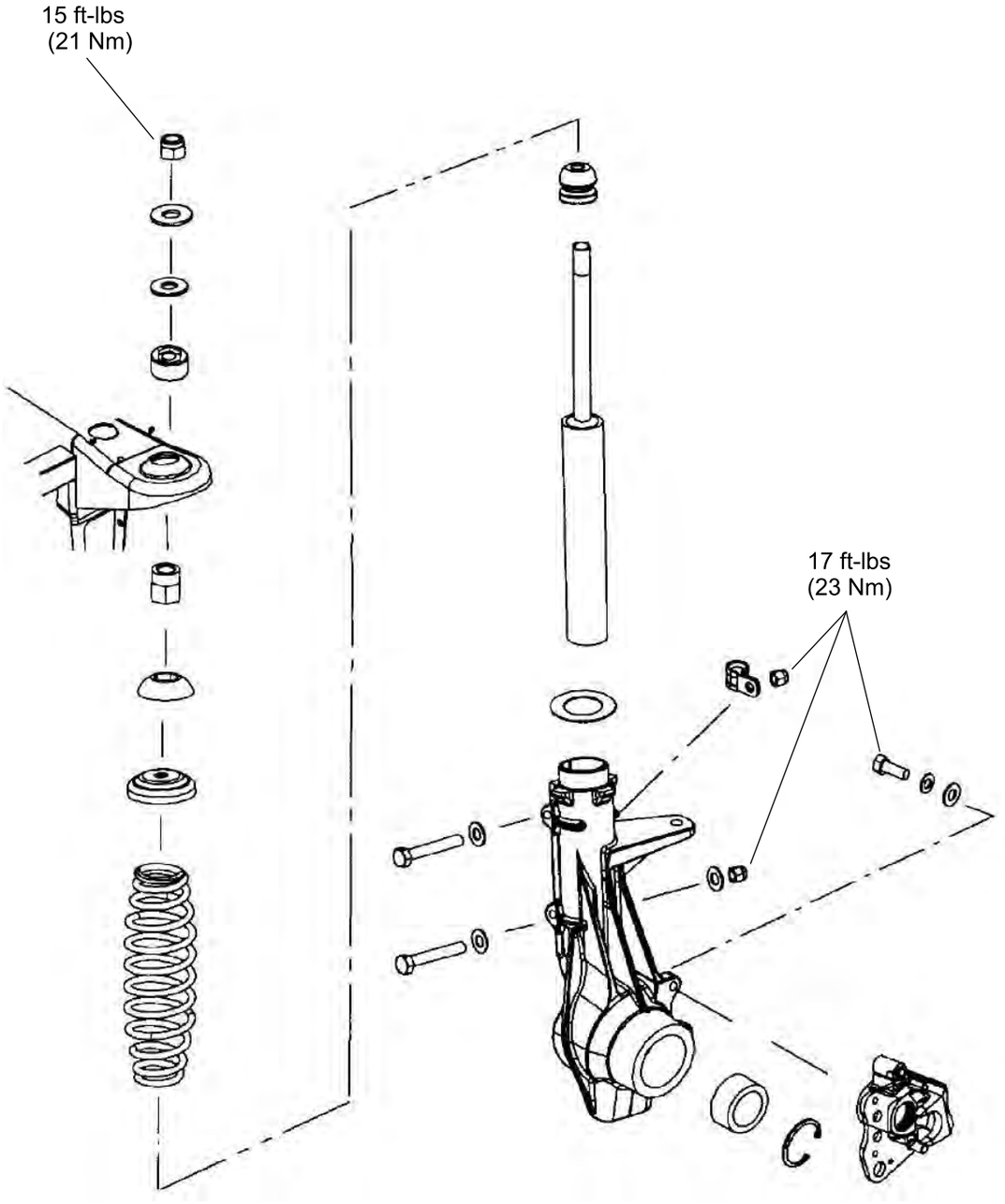
Torsion Bar Exploded View



REF.	DESCRIPTION	NOTE
1	BOLT, FLANGE	
2	NUT, FLANGE	17 ft-lbs (23 Nm)
3	WASHER	
4	BUSHING, STABILIZER TUBE, BLACK	
5	BAR, STABILIZER TUBE, BLACK	
6	ARM, STABILIZER BAR, BLACK	
7	SCREW	30 ft-lbs (40 Nm)
8	SUPPORT, STABILIZER, BLACK	
9	BUSHING, STABILIZER	
10	ROD, LINKAGE, STABILIZER	

Strut Assembly



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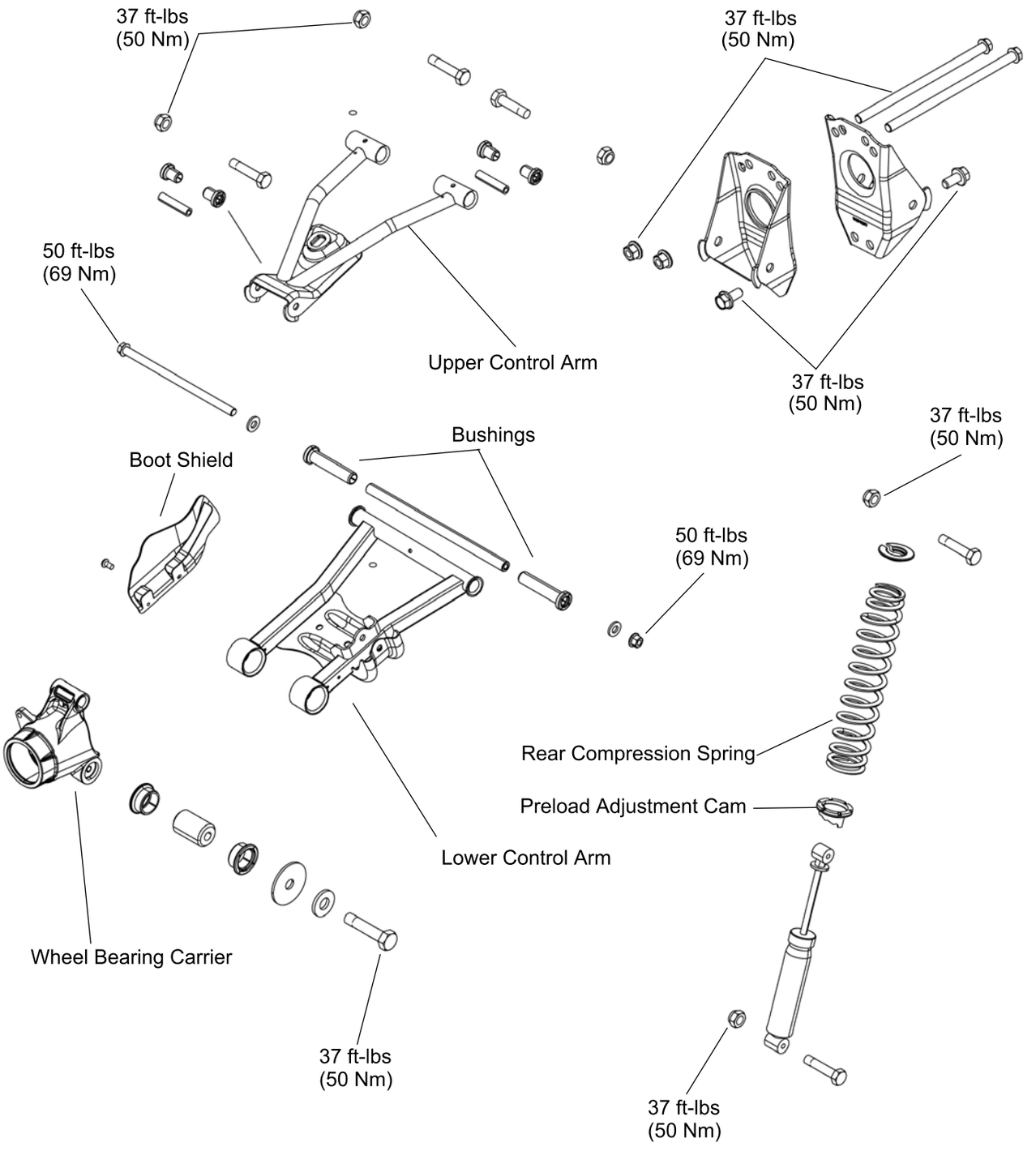
Sportsman Rear Suspension Assembly



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Front Strut Cartridge Replacement

NOTE: Refer to illustration on following page.

1. Hold strut rod and remove top nut.
2. Remove upper strut pivot assembly.

Strut Rod Wrench: **(PN 2871572)** **Strut Spring Compressor Tools:** **(PN 2871573) and (PN 2871574)**

3. Compress spring using any commercially available spring compressor tool and remove the spacer nut.
4. Remove coil spring and collapse strut cartridge.
5. Remove two pinch bolts from strut casting.
6. Remove strut cartridge.
7. Install cartridge until bottomed in strut casting.
8. Install pinch bolts with wire clamp(s). Torque pinch bolts to specification.

= T
Pinch Bolt: **17 ft-lbs (23 Nm)**

9. Reassemble spring and top pivot assembly. Be sure all parts are installed properly and seated fully.
10. Torque strut rod nut to specification. Do not over torque the nut.

= T
Strut Rod Nut: **15 ft-lbs (21 Nm)**

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DECAL REPLACEMENT

Decal Replacement

Flame Treating Decal Area

Plastic polyethylene material must be “flame treated" prior to installing a decal to ensure good adhesion. The flame treating procedure can often be used to reduce or eliminate the whitish stress marks that are sometimes left after a fender or cab is bent, flexed, or damaged.

⚠ WARNING

The following procedure involves the use of an open flame. Wear the appropriate safety equipment at all times. Perform this procedure in a well ventilated area, away from gasoline or other flammable materials. Verify the area to be flame treated is clean and free of gasoline or flammable residue.

1. Pass the flame tip of a propane torch back and forth quickly over the area where the decal is to be applied until the surface appears slightly glossy. This should occur after just a few seconds of flame treating. Do not hold the torch too close to the surface. Keep the torch moving to prevent damage.
2. Apply the decal.

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CHAPTER 6
CLUTCHING

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GENERAL INFORMATION

Clutching Chart

ALTITUDE		SHIFT	DRIVE CLUTCH SPRING	DRIVEN CLUTCH SPRING	HELIX*
Meters (Feet)	0-1800 (0-6000)	25–52G PN 5632409	Black PN 7043594	Non-EBS: Black PN 7041782 EBS: Red PN 3234451	EBS PN 3234356 Non-EBS PN 5132344
	1800–3700 (6000–12000)	25–48 PN 5632408	Black PN 7043594	Non-EBS: Black PN 7041782 EBS: Red PN 3234451	EBS PN 3234356 Non-EBS PN 5132344

*EBS models require no helix/spring adjustment

Special Tools

PART NUMBER	TOOL DESCRIPTION
2870506	Drive Clutch Puller
9314177	Clutch Holding Wrench
2871358	Clutch Holding Fixture
2870341	Drive Clutch Spider Removal and Install Tool
2870910	Roller Pin Tool
2871226	Clutch Bushing Replacement Tool Kit
2870386	Piston Pin Puller
PU-50518	Universal Clutch Compressor Tool
2871025	Clutch Bushing Replacement Tool Kit
PA-49011–A	Clutch Alignment Tool
2871710	Center Distance Tool

PART NUMBER	SPECIAL SUPPLIES
N/A	Loctite™ 648
8560054	RTV Silicone Sealer

Bosch Automotive Service Solutions- 1-800-328-6657 or online at http://polaris.service-solutions.com/

PVT System Fastener Torques

ITEM	TORQUE VALUE FT-LBS (NM)
Drive Clutch Retaining Bolt	47 ft-lbs (64 Nm)
Driven Clutch Retaining Bolt	13 ft-lbs (17 Nm)
PVT Inner Cover Bolts	12 ft-lbs (16 Nm)
PVT Outer Cover Bolts	4 ft-lbs (5.4 Nm)
Drive Clutch Spider	200 ft-lbs (271 Nm)
Drive Clutch Cover Plate	90 in-lbs (10 Nm)

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PVT SYSTEM OVERVIEW

General Operation

⚠ WARNING

All PVT maintenance or repairs should be performed only by a certified Polaris Master Service Dealer (MSD) technician who has received the proper training and understands the procedures outlined in this manual.

Because of the critical nature and precision balance incorporated into the PVT components, it is absolutely essential that no disassembly or repair be made without factory authorized special tools and service procedures.

The Polaris Variable Transmission (PVT) consists of three major assemblies:

1) The Drive Clutch

2) The Driven Clutch

3) The Drive Belt

The internal components of the drive clutch and driven clutch control engagement (initial vehicle movement), clutch upshift and backshift. During the development of a Polaris ATV, the PVT system is matched first to the engine power curve; then to average riding conditions and the vehicle's intended usage. Therefore, modifications or variations of components at random are never recommended. Proper clutch setup and careful inspection of existing components must be the primary objective when troubleshooting and tuning.

Drive Clutch Operation

Drive clutches primarily sense engine RPM. The two major components which control its shifting function are the shift weights and the coil spring. Whenever engine RPM is increased, centrifugal force is created, causing the shift weights to push against rollers on the moveable sheave, which is held open by coil spring preload. When this force becomes higher than the preload in the spring, the outer sheave moves inward and contacts the drive belt. This motion pinches the drive belt between the spinning sheaves and causes it to rotate, which in turn rotates the driven clutch. At lower RPM, the drive belt rotates low in the drive clutch sheaves. As engine RPM increases, centrifugal force causes the drive belt to be forced upward on drive clutch sheaves.

Driven Clutch Operation

Driven clutches primarily sense torque, opening and closing according to the forces applied to it from the drive belt and the transmission input shaft. If the torque resistance at the transmission input shaft is greater than the load from the drive belt, the drive belt is kept at the outer diameter of the driven clutch sheaves.

As engine RPM and horsepower increase, the load from the drive belt increases, resulting in the belt rotating up toward the outer diameter of the drive clutch sheaves and downward into the sheaves of the driven clutch. This action, which increases the driven clutch speed, is called upshifting.

Should the throttle setting remain the same and the vehicle is subjected to a heavier load, the drive belt rotates back up toward the outer diameter of the driven clutch and downward into the sheaves of the drive clutch. This action, which decreases the driven clutch speed, is called backshifting.

In situations where loads vary (such as uphill and downhill) and throttle settings are constant, the drive and driven clutches are continually shifting to maintain optimum engine RPM. At full throttle a perfectly matched PVT system should hold engine RPM at the peak of the power curve. This RPM should be maintained during clutch upshift and backshift. In this respect, the PVT system is similar to a power governor. Rather than vary throttle position, as a conventional governor does, the PVT system changes engine load requirements by either upshifting or backshifting.

Maintenance / Inspection

Under normal use the PVT system will provide years of trouble free operation. Periodic inspection and maintenance is required to keep the system operating at peak performance. The following list of items should be inspected and maintained to ensure maximum performance and service life of PVT components. Refer to the troubleshooting checklist at the end of this chapter for more information.

1. **Belt Inspection, Drive to Driven Clutch Alignment, and Clutch Center Distance.**
2. **Drive and Driven Clutch Buttons and Bushings, Drive Clutch Shift Weights and Pins, Drive Clutch Spider Rollers and Roller Pins, Drive and Driven Clutch Springs.**
3. **Sheave Faces.** Clean and inspect for wear.
4. **PVT System Sealing.** Refer to appropriate illustrations on the following pages. The PVT system is air cooled by fins on the drive clutch stationary sheave. The fins create a low pressure area in the crankcase casting, drawing air into the system through an intake duct. The opening for this intake duct is located at a high point on the vehicle (location varies by model). The intake duct draws fresh air through a vented cover. All connecting air ducts (as well as the inner and outer covers) must be properly sealed to ensure clean air is being used for cooling the PVT system and also to prevent water and other contaminants from entering the PVT area. This is especially critical on units subjected to frequent water fording.

PVT Break-In (Drive Belt / Clutches)

A proper break-in of the clutches and drive belt will ensure a longer life and better performance. Break in the clutches and drive belt by operating at slower speeds during the 10 hour break-in period as recommended (see Chapter 3 “Engine Break-In Period” for break-in example). Pull only light loads. Avoid aggressive acceleration and high speed operation during the break-in period.

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Overheating / Diagnosis

During routine maintenance, or whenever PVT system overheating is evident, it's important to check the inlet *and* outlet ducting for obstructions. Obstructions to air flow through the ducts will significantly increase PVT system operating temperatures. The vehicle should be operated in Low when plowing or pulling heavy loads, or if extended low speed operation is anticipated.

CLUTCH DRIVE BELT & COVER RELATED ISSUES: DIAGNOSIS	
POSSIBLE CAUSES	**SOLUTIONS / WHAT TO DO**
Loading the vehicle into a truck or tall trailer when in high range.	Shift transmission to Low during loading of the vehicle to prevent belt burning.
Starting out going up a steep incline from a stopped position.	When starting out on an incline, use Low, or dismount the vehicle after first applying the park brake and perform the "K" turn.
Driving at low RPM or low ground speed (at approximately 3-7 MPH).	Drive at higher speed or use Low. The use of Low is highly recommended for cooler PVT operating temperatures and longer component life.
Insufficient warm-up of vehicles exposed to low ambient temperatures.	Warm engine at least 5 min., then with transmission in neutral, advance throttle to approx. 1/8 throttle in short bursts, 5 to 7 times. The belt will become more flexible and prevent belt burning.
Slow and easy clutch engagement.	Fast, effective use of the throttle for efficient engagement.
Towing/Pushing at low RPM/low ground speed.	Use Low only.
Plowing snow, dirt, etc./utility use.	Use Low only.
*Stuck in mud or snow.	Shift the transmission to Low, carefully use fast, aggressive throttle application to engage clutch.
*Climbing over large objects from a stopped position.	Shift the transmission to Low, carefully use fast, aggressive, brief throttle application to engage clutch.
Belt slippage from water or snow ingestion into the PVT system.	Shift the transmission to neutral. Using the throttle, vary the engine rpm from idle to full throttle. Repeat several times as required. During this procedure, the throttle should not be held at the full position for more than 10 seconds. Clutch seals should be inspected for damage if repeated leaking occurs.
Clutch malfunction.	For inspection of clutch components, please contact your Polaris dealer. Shift transmission to Low during loading of the vehicle to prevent belt burning.
Poor engine performance.	Fouled plugs, foreign material in gas tank, fuel lines, or carburetor. Contact you dealer for further service information.
GENERAL RANGE OPERATION GUIDELINES:	Low: Heavy pulling, basic operational speeds less than 7 MPH, riding through rough terrain (swamps, mountains, ect.), low ground speeds.
	High: High ground speeds, speeds above 7 MPH.

*See Warning below.

NOTE: Using High for heavy loads, hilly terrain, or in wet, muddy conditions will increase the chance of drive belt burning.

⚠ WARNING

Excessive throttle may cause loss of control and vehicle overturn.

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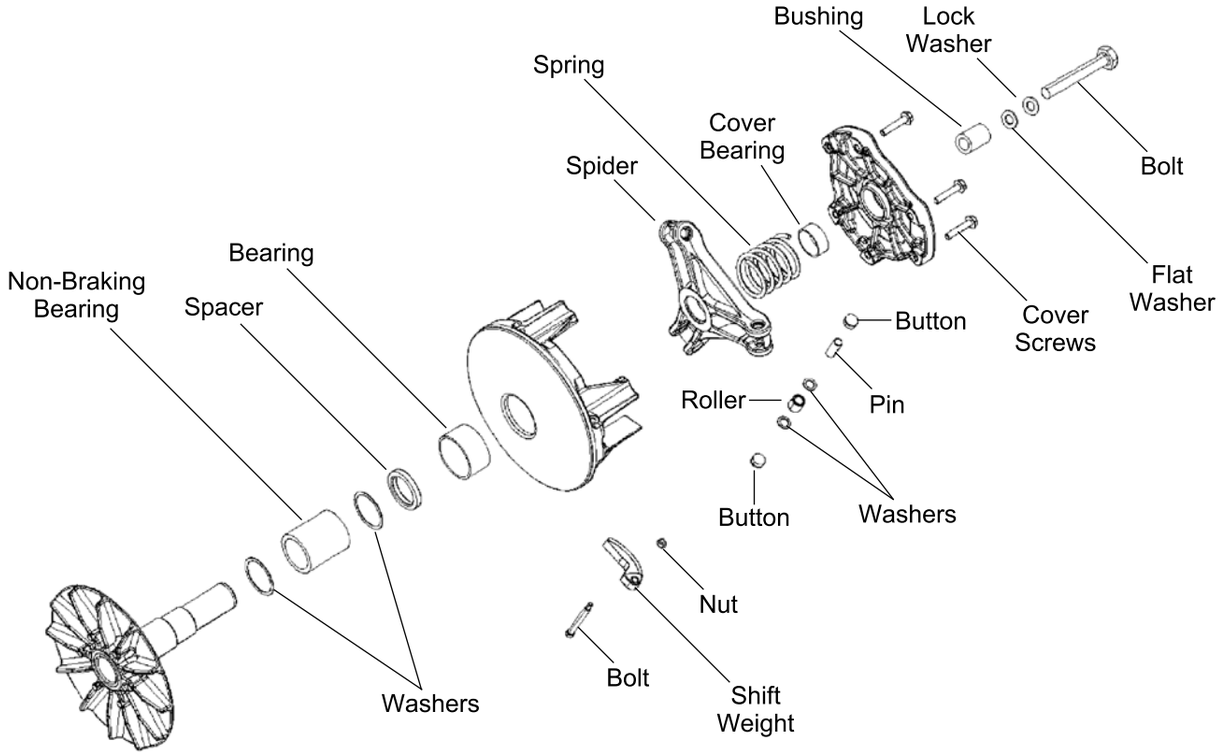
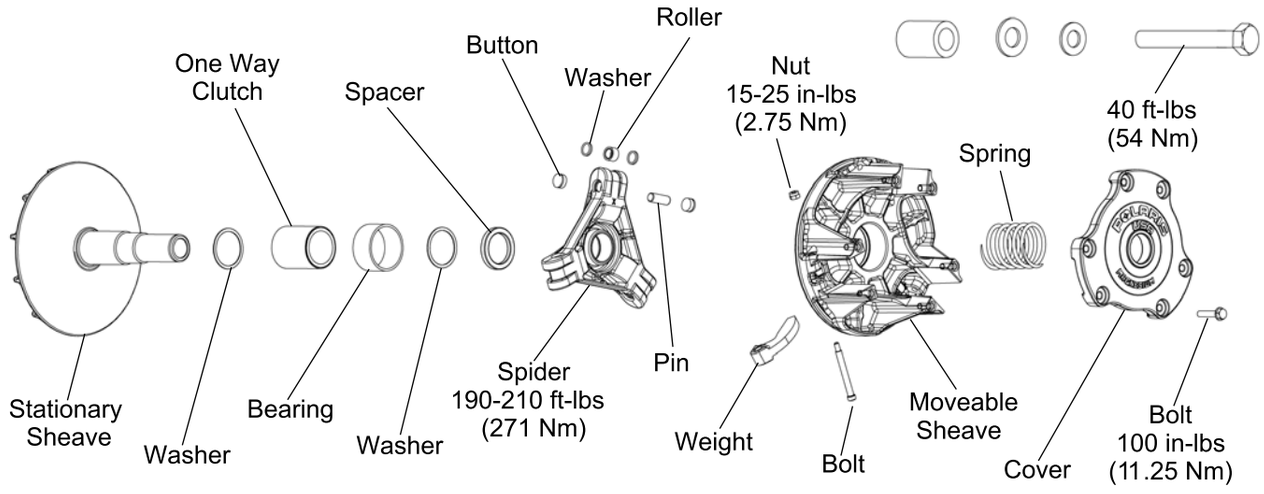
PVT EXPLODED VIEWS

Drive Clutch Exploded Views (EBS vs. Non-EBS)

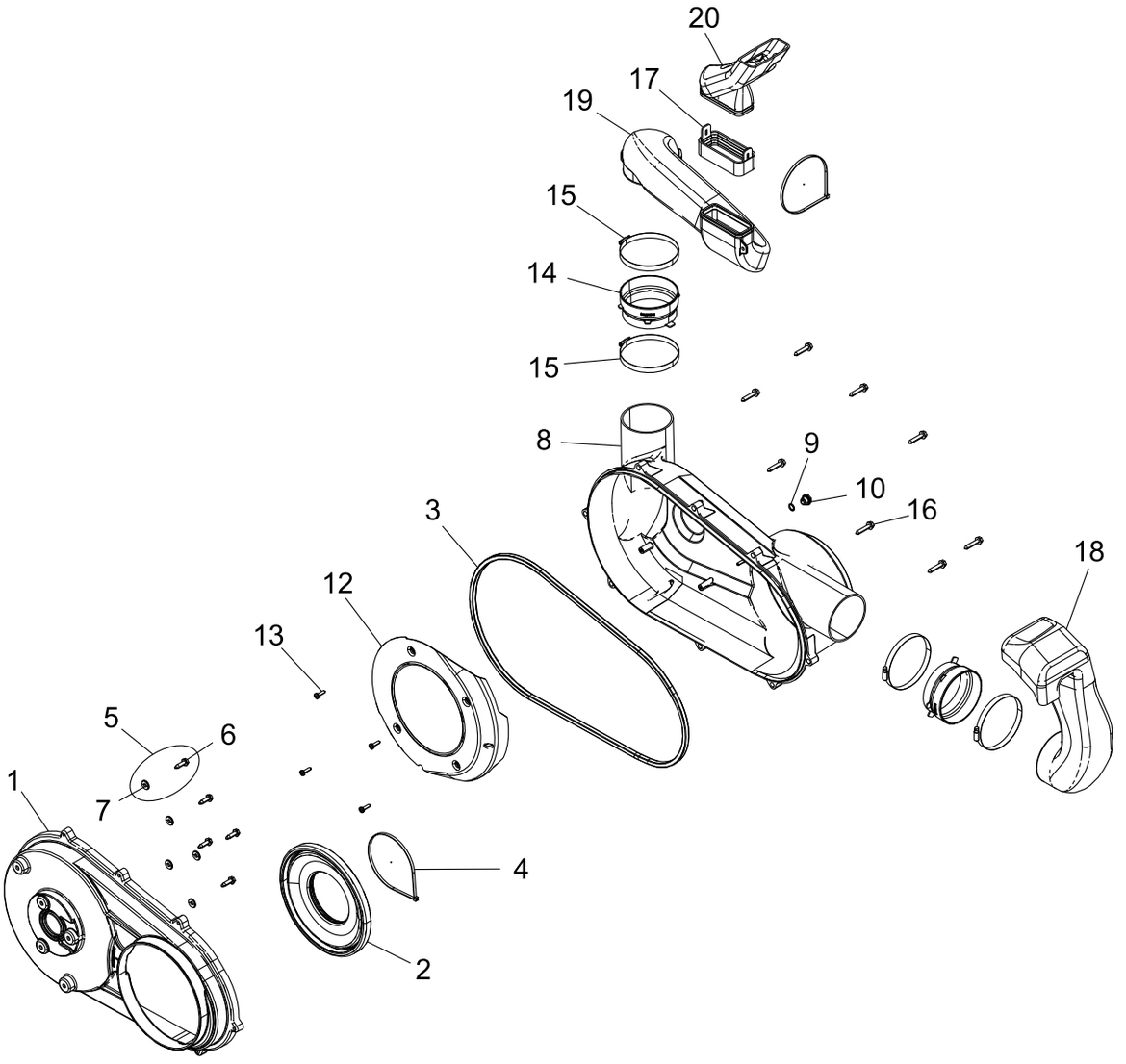
NON EBS Clutch



EBS Clutch



PVT Sealing And Ducting Components



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PVT Sealing And Ducting Components

PART	DESCRIPTION	NOTES
1	Inner Clutch Cover	
2	Inner Clutch Cover Seal	Replace if cracked or damaged.
3	Outer Clutch Cover Seal	Replace if cracked or damaged.
4	14” Panduit® Strap	
5	Screw / Washer, Inner Clutch Cover	
6	Screw, Inner Clutch Cover	Torque Fastener Until Fully Seated
7	Washer, Inner clutch Cover	
8	Outer Clutch Cover	
9	O-ring	Replace if cracked or damaged.
10	Clutch cover Drain Plug	
12	Outer Clutch Cover Baffle	**WARNING** Do not operate the vehicle without the clutch cover baffle installed.
13	Screw, Outer Clutch Cover Baffle	Torque Fastener Until Fully Seated
14	14” Panduit® Strap	
15	Clamp - Worm Drive	Torque to 20 in-lbs ± 10 %
16	Outer Clutch Cover Screw	Torque to 4 ft-lbs ± 10 %
17	Inlet Duct Boot	Replace if cracked or damaged.
18	Clutch Cover Outlet Duct	
19	Lower Clutch Air Inlet Duct	
20	Upper Clutch Air Inlet Duct	

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PVT SYSTEM SERVICE

Disassembly

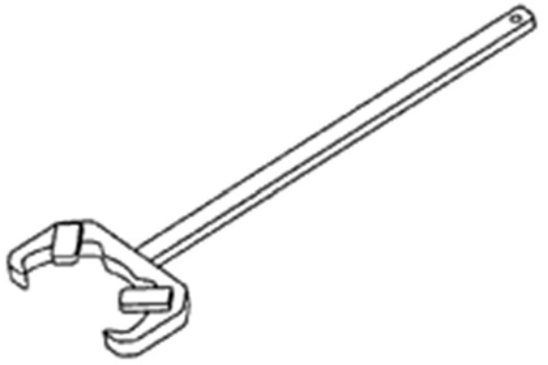
Some fasteners and procedures will vary. Refer to the appropriate parts manual for proper fasteners and fastener placement.

1. Remove seat, left side panel, left footwell, and left footwell support to gain access to PVT outer cover (see Chapter 5 for removal).
2. Remove PVT air inlet and outlet ducts.
3. Remove outer PVT cover screws.
4. Mark the drive belt direction of rotation and remove drive belt. See “Drive Belt Removal”.

Drive Clutch Puller:
(PN 2870506)

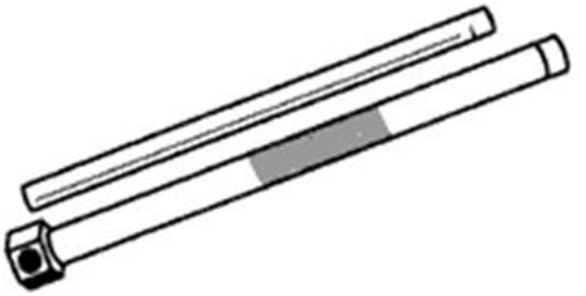
Drive Clutch Holder:
(PN 9314177–A)

5. Install the Drive Clutch Holder (PN 9314177–A) and Remove drive clutch retaining bolt.

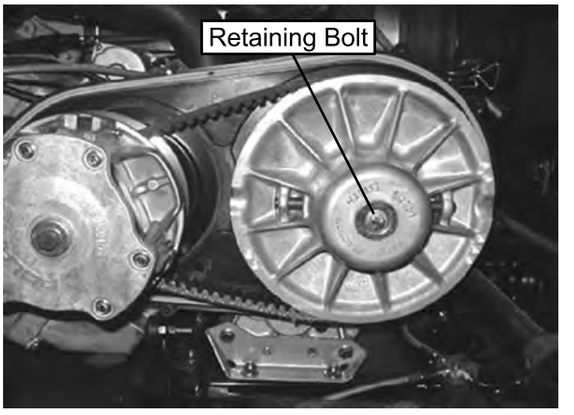


NOTE: Discard drive clutch retaining bolt and replace with new for assembly.

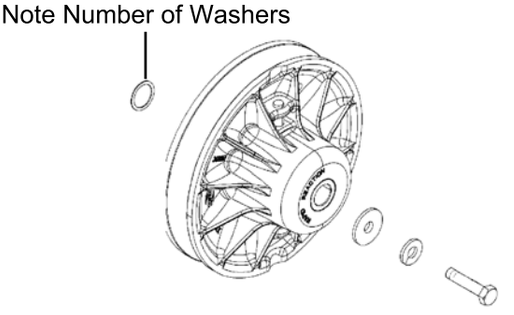
6. remove drive clutch using the Drive Clutch Puller (PN 2870506).



7. Remove the driven clutch retaining bolt and driven clutch.



8. Remove driven clutch alignment washer(s) from the transmission input shaft.



9. Remove inner cover retaining bolts and Panduit® strap.
10. Remove cover along with foam seal on back of cover or shaft.

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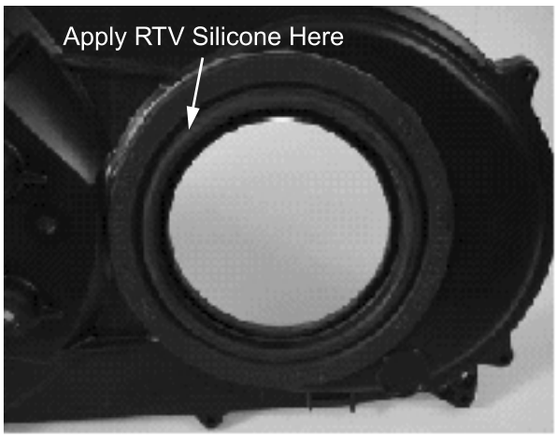
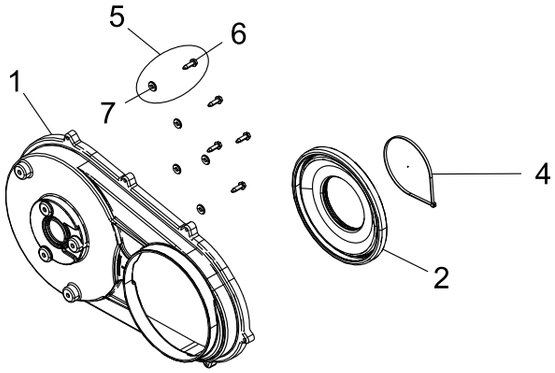
Assembly

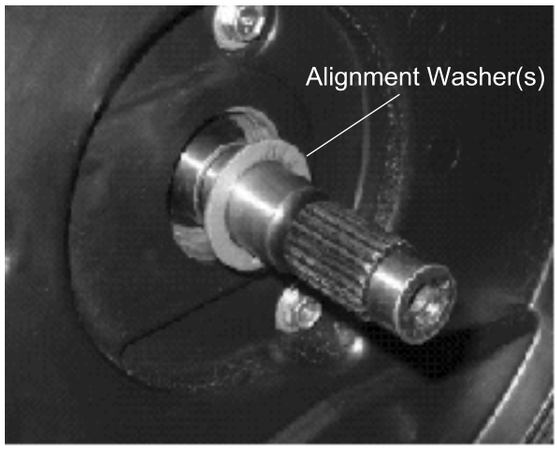
1. Inspect PVT inner cover-to engine seal. Replace if cracked or damaged.



2. Place a new foam seal on transmission input shaft.
3. Apply RTV silicone sealant to outside edge of inner cover-to-engine seal, to ensure a water tight fit between the seal and the cover. Surfaces must be clean to ensure adhesion of silicone sealant.
4. Reinstall cover and tighten rear cover bolts just enough to hold it in place.
5. Fit lip of inner cover seal (2) to engine. Install Panduit® to seal and tighten until secure.



6. Install clutch alignment washer (s) on transmission input shaft.



7. Clean splines inside driven clutch and on the transmission input shaft.
8. Apply a light film of grease to the splines on the shaft.
9. Install the driven clutch, washer, lock washer, and retaining bolt. Torque to specification.
10. Clean end of taper on crankshaft and the taper bore inside drive clutch.
11. Install drive clutch and torque the **NEW** retaining bolt to specification.
12. Reinstall drive belt noting direction of rotation. If a new belt is installed, install so numbers can be easily read.
13. Replace PVT outer clutch cover rubber gasket.
14. Reinstall PVT outer clutch cover and secure with screws. Torque to specification.
15. Install the PVT cover inlet / outlet ducts and tighten the clamps. Torque to specification.

= T
Inner Cover Bolt (Rear): 12 ft-lbs (16.6 Nm) **Outer Cover Bolt:** 4 ft-lbs (5.4 Nm) **Driven Clutch Retaining Bolt:** 13 ft-lbs (17 Nm) **Drive Clutch Retaining Bolt:** 47 ft-lbs (64 Nm)

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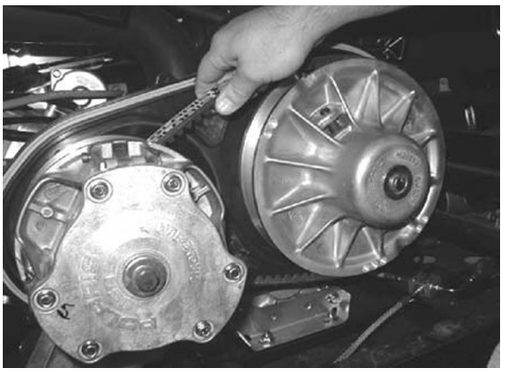
DRIVE BELT

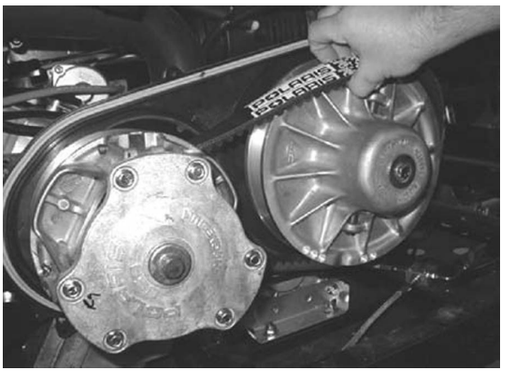
Belt Removal

1. Remove outer PVT cover as described in PVT Disassembly.
2. Mark the drive belt direction of rotation so that it can be installed in the same direction.

   NOTE: Belt is normally positioned so that part numbers are easily read.



3. To remove drive belt, put transmission in gear, apply brake, pull upward and rearward on belt to open driven clutch sheaves, pull out and down on belt to slip over the driven clutch outer sheave.

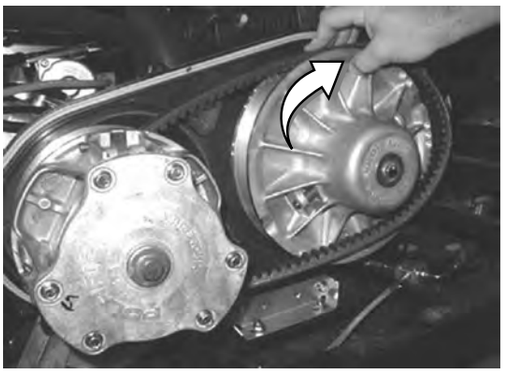


Belt Inspection

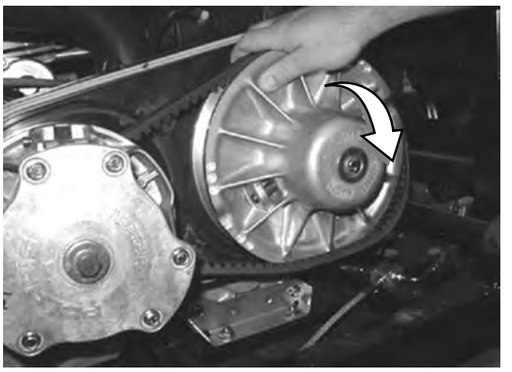
1. Inspect belt for hour glassing (extreme circular wear in at least one spot and on both sides of the belt). Hour glassing occurs when the drive train does not move and the drive clutch engages the belt.
2. Inspect belt for loose cords, missing cogs, cracks, abrasions, thin spots, or excessive wear. Compare belt measurements with a new drive belt. Replace if necessary.
3. Belts with thin spots, burn marks, etc., should be replaced to eliminate noise, vibration, or erratic PVT operation. See the Troubleshooting Chart at the end of this chapter for possible causes.

Belt Installation

1. Loop belt over the drive clutch and over top of the driven sheave.



2. While pushing down on top of belt, turn the back or moveable driven sheave clockwise.



3. The belt then should be able to be pushed down into and between the sheaves.

   Be sure to position belt so part number is easily read.

PVT Break-In (Drive Belt / Clutches)

A proper break-in of the clutches and drive belt will ensure a longer life and better performance. Break in the clutches and drive belt by operating at slower speeds during the 10 hour break-in period as recommended (see Chapter 3 “Engine Break-In Period” for break-in example). Pull only light loads. Avoid aggressive acceleration and high speed operation during the break-in period.

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CLUTCH ALIGNMENT

Clutch Alignment Tool Use

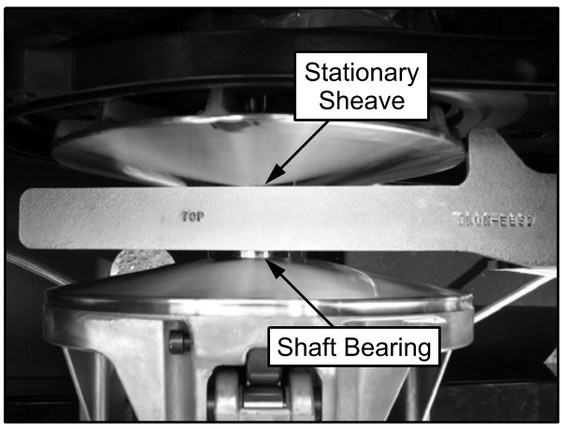
Clutch alignment is controlled by the number of washers that are placed behind the driven clutch on the transmission input shaft. Adding washers behind the driven clutch will move the drive belt toward the moveable sheave of the drive clutch. Removing washers from behind the driven clutch will move the drive belt toward the stationary sheave of the drive clutch.

1. Remove the seat.
2. Remove the LH side panel and footwell to gain access to the outer PVT cover (see Chapter 5 for removal).
3. Loosen the hose clamp and remove the PVT air outlet duct hose from the outer PVT cover.
4. Remove all outer PVT cover screws and remove the cover.
5. Mark the drive belt direction of rotation and remove drive belt (see “Drive Belt Removal”).
6. Install the Clutch Alignment Tool.

7. Place the alignment tool in the sheaves of the driven clutch and hold firmly as you rotate it down between the sheaves of the drive clutch.

Clutch Alignment Tool:
PA-49011–A

8. As you rotate the tool down between the drive clutch sheaves, the tool should touch the clutch shaft bearing while maintaining a clearance of roughly .020” between the tool and stationary sheave of the drive clutch.



9. If the alignment tool hits the stationary sheave before it reaches the shaft bearing, the driven clutch will need to be spaced out to correct the alignment.
   - Remove the driven clutch. Add the required amount of alignment washers to obtain the correct measurement with the alignment tool. You may need to add more than one alignment washer.

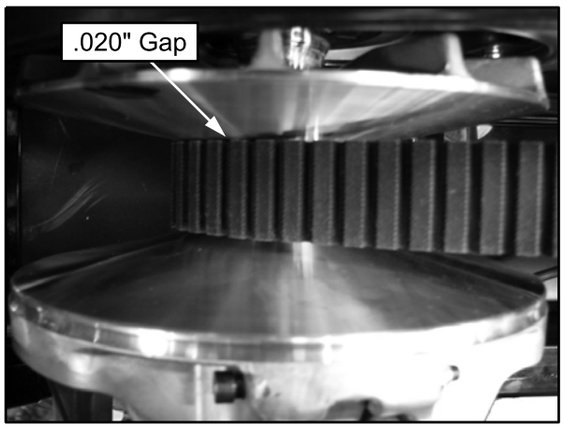
Alignment Washers:
(.060”) PN: 7556120

10. If the alignment tool touches the shaft bearing but has an excessive amount of clearance between the tool and stationary sheave, the driven clutch will need to be moved in to correct the alignment.
    - Remove the driven clutch. Remove the required amount of washers to obtain roughly .020” clearance between the tool and stationary sheave.

      NOTE: The number of washers behind the driven clutch will vary between vehicles.

      It may not be possible to achieve perfect alignment with the tool as previously described, due to the thickness of the alignment washers. It is better to have clearance between the tool and stationary sheave of the drive clutch than to have the tool touch the stationary sheave before it touches the shaft bearing.

11. After completing the clutch alignment procedure, the belt should ride in the drive clutch with an approximate .020” gap between the belt and stationary sheave and a larger gap between the belt and moveable sheave.



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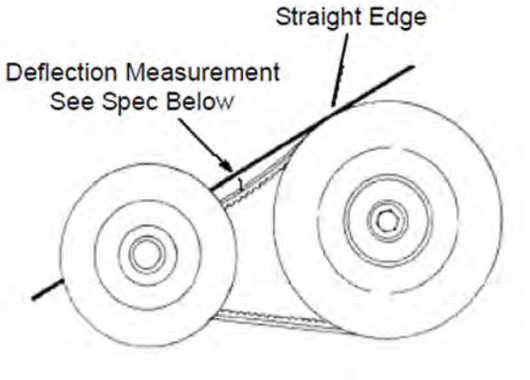
Belt Deflection (Tension) (NON EBS ONLY)



Belt Deflection (Tension):

Maximum 1 1/8” (2.9 cm)

Pinch the sheaves lightly together with clamp to prevent the belt from being pushed into the driven sheave.

1. Place a straight edge on top of the belt between drive and driven clutch.
2. Push down on drive belt until it is lightly tensioned.
3. Measure belt deflection as shown in the image above.

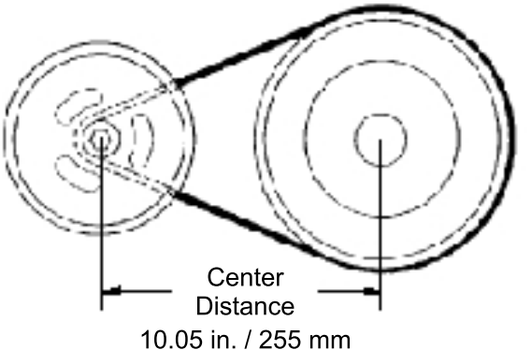
   If belt deflection is out of specification, adjust by removing or adding shims between the driven clutch sheaves.

   - Remove shims to decrease belt deflection
   - Add shims to increase belt deflection

   Refer to “Driven Clutch Service” section.

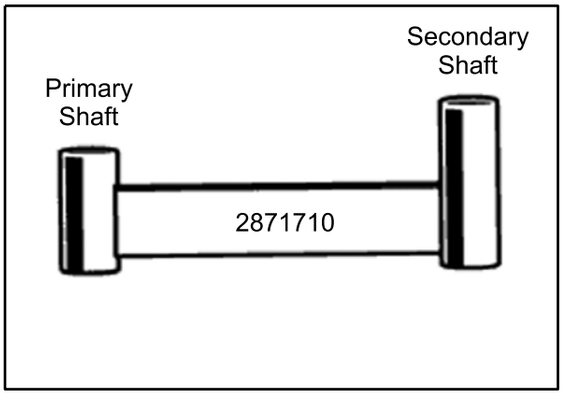
   At least one shim must remain between the inner and outer sheave of the driven clutch. If proper belt deflection cannot be obtained, measure drive belt width, length, and center distance of drive and driven clutch, outlined in this section; all have an effect on belt deflection.

Setting Center-To-Center Distance



Clutch center distance is controlled by the correct positioning of the engine and transmission mounting. The 10” Center Distance Tool (PN 2871710) should be used for the following:

- After engine installation.
- After transmission installation.
- After engine or transmission mount replacement.
- If the vehicle exhibits drive clutch drag or hard shifting while at idle speed, after clutch offset adjustment has been performed.



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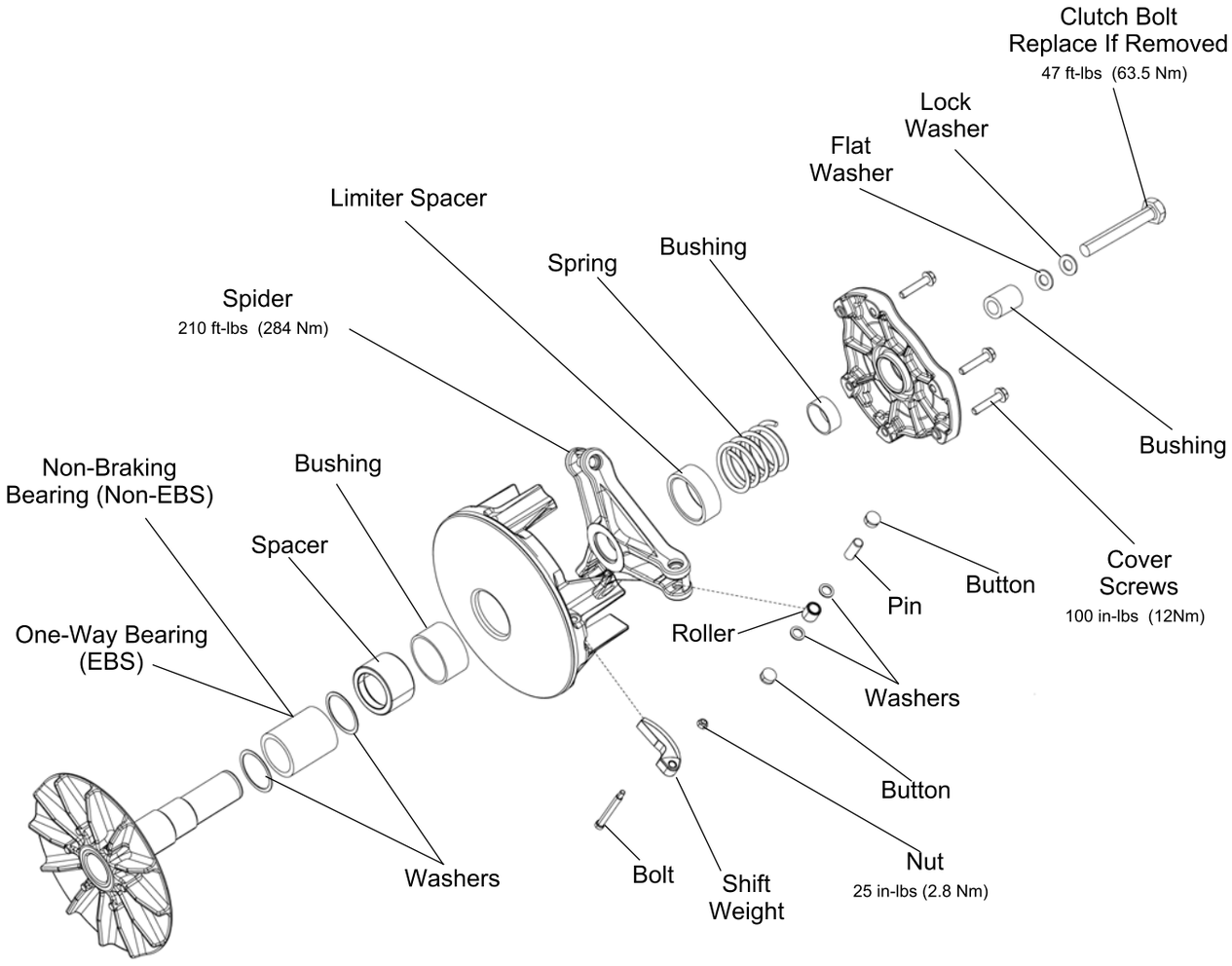
DRIVE CLUTCH SERVICE

Drive Clutch Exploded View (All Models)



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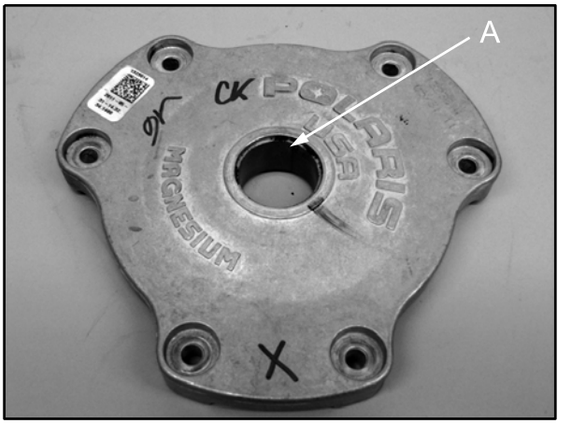
Clutch Disassembly

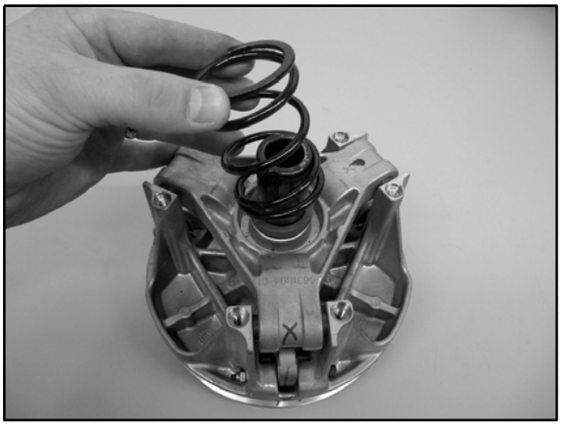
1. Using a permanent marker, mark the cover, spider, and moveable and stationary sheaves for reference, as the cast in X's may not have been in alignment before disassembly.

2. Mark the stationary sheave and clutch shaft to verify the shaft has not turned in the sheave after tightening the spider during clutch assembly.
3. Remove the (6) cover bolts evenly in a cross pattern and remove cover plate.
4. Inspect cover bushing (A). The outer cover bushing is manufactured with a Teflon coating. Wear is determined by the amount of Teflon remaining on the bushing.

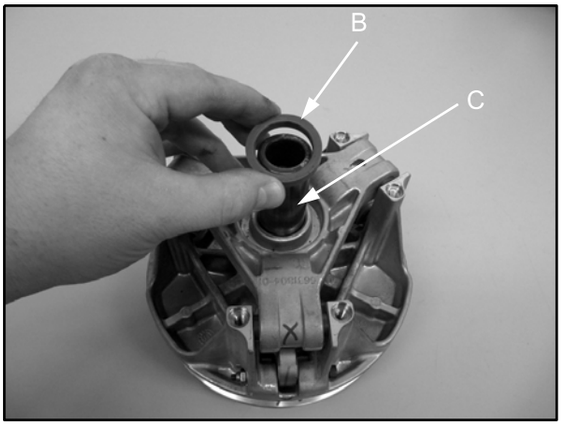


Cover Bushing Inspection:
Replace the cover bushing if more brass than Teflon is visible on the bushing. Refer to bushing replacement in this chapter.

5. Remove and inspect the clutch spring. See “Drive Clutch Spring Specifications” for spring inspection.



6. Remove the limiter spacer (B) and inspect for wear. Replace if excessive wear is evident.
7. Inspect area on shaft (C) where bushing rides for wear, galling, nicks, or scratches. Replace clutch assembly if worn or damaged.



CAUTION

DO NOT reassemble the drive clutch without the limiter spacer (B). Belt life will be greatly reduced.

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Drive Clutch Spring Inspection

CAUTION

Never shim a drive clutch spring to increase its compression rate. This may result in complete stacking of the coils and subsequent clutch cover failure.

The drive clutch spring is one of the most critical components of the PVT system. It is also one of the easiest to service. Due to the severe relaxation the spring is subject to during operation, it should always be inspected for tolerance limits during any clutch operation diagnosis or repair.

With the spring resting on a flat surface, measure its free length from the outer coil surfaces. Also check to see that spring coils are parallel to one another. Distortion of the spring indicates stress fatigue, requiring replacement.

Drive Clutch Spring Specifications

Color	Black
Free Length	2.8” (71.12mm)

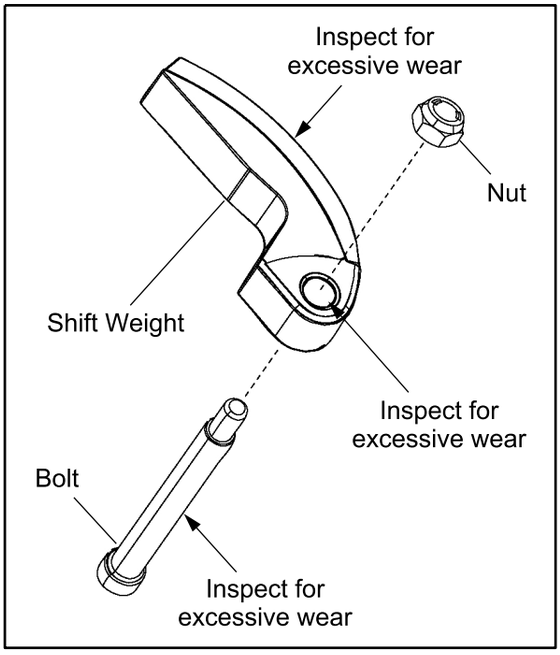
Shift Weight Inspection

1. Remove shift weight bolts and weights. Inspect the contact surface of the weight. The surface should be smooth and free of dents or gall marks. Inspect the weight pivot bore and bolts for wear or galling. If weights or bolts are worn or broken, replace in sets of three with new bolts and nuts.

WARNING

The clutch assembly is a precisely balanced unit. Never replace parts with used parts from another clutch assembly!

2.



NOTE: A damaged shift weight is usually caused by a damaged or stuck roller in the spider assembly. See “Roller, Pin and Thrust Washer Inspection”.

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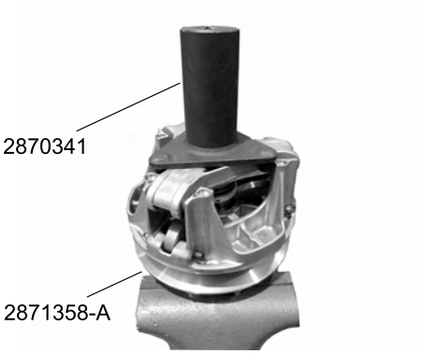
Spider Removal

1. Install clutch in holding fixture (PN 2871358-A) and loosen the spider (counterclockwise) using Clutch Spider Removal Tool (PN 2870341).



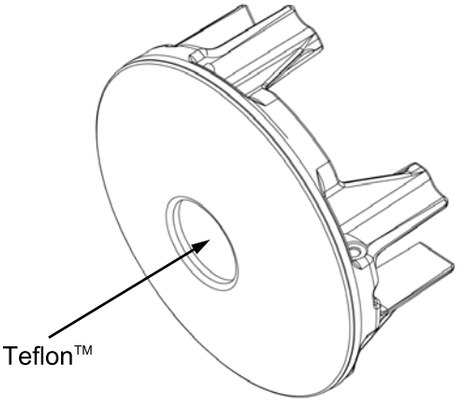
Clutch Holding Fixture:
PN 2871358-A

Spider Removal Tool:
PN 2870341

NOTE:

Moveable Sheave Bushing Inspection

2. Inspect the Teflon™ coating on the moveable sheave bushing.

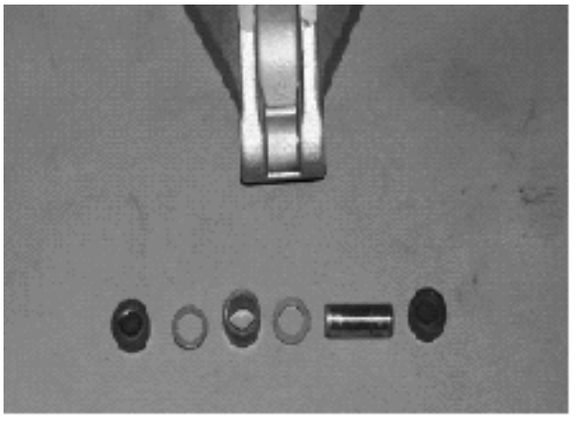


Moveable Sheave Bushing Inspection:
Replace the cover bushing if more brass than Teflon is visible on the bushing. Refer to bushing replacement in this chapter.

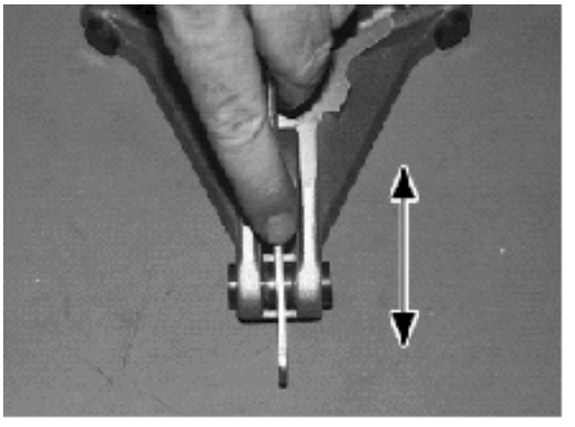
Roller, Pin, and Thrust Washer Inspection

Inspect all rollers, bushings and roller pins by pulling a flat metal rod across the roller.

NOTE: The rubber side of the button is positioned toward the solid roller pin.



1. Turn roller with your finger. If you notice resistance, galling, or flat spots, replace rollers, pins and thrust washers in sets of three.



2. Inspect to see if roller and bushing are separating. Bushing must fit tightly in roller.
3. Use the Roller Pin Tool (PN 2870910) to replace rollers and pins as necessary.

NOTE: Take care not to damage roller bushing or bearing surface of the new pin during installation.

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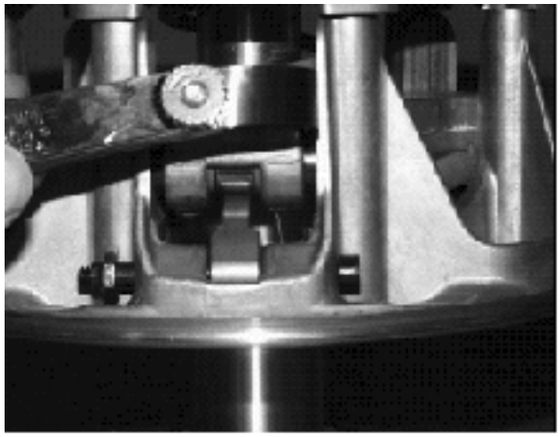
Button To Tower Clearance Inspection

1. Inspect for any clearance between spider button to tower. If clearance exists, replace all buttons and inspect surface of towers. See “Spider Removal” procedure.

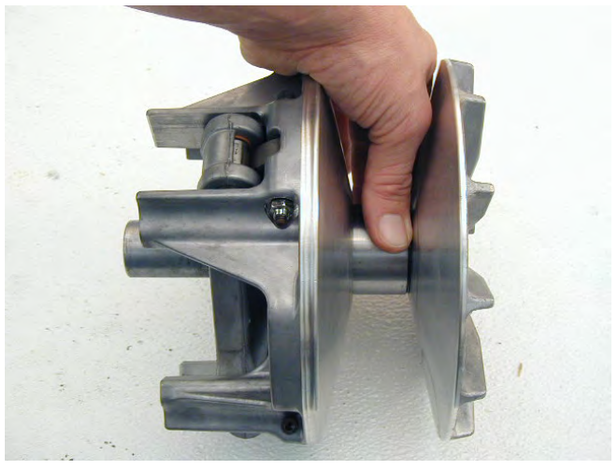


Button to Tower Clearance:
.000-.010”

2. Inspect sheave surfaces. Replace the entire clutch if worn, damaged or cracked.

Bearing Inspection

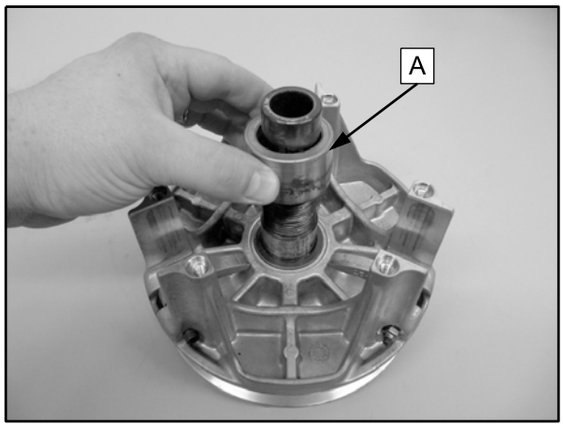
1. Rotate the clutch bearing in both clockwise and counter-clockwise directions.
   - **Non-EBS:** The non-braking bearing should rotate both directions on the shaft with only a slight amount of drag.
   - **EBS:** The one-way bearing should rotate clockwise (when viewed from cover plate side) with only a slight amount of drag. When rotated counter-clockwise the one-way bearing should lock to the shaft without slipping.
2. Verify there is no binding or rough spots. If problems are noted continue with disassembly.



Clutch Inspection

NOTE: Remove cover, spring, and spider following instructions for drive clutch removal, then proceed as follows:

1. Remove the moveable sheave spacer sleeve (A). Inspect for damage and wear.



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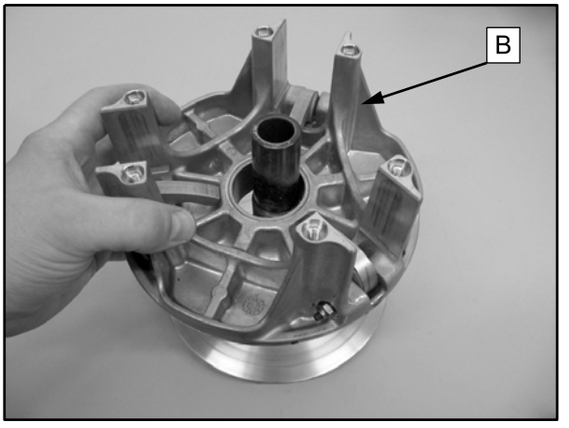
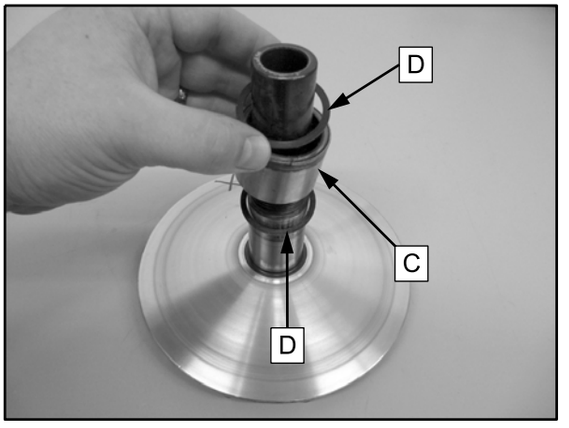
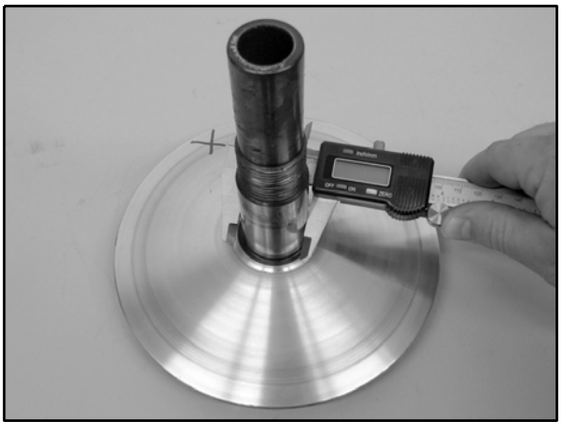
2. Remove the moveable clutch sheave (B). Inspect for damage and wear.



3. Lift bearing (C) and thrust washers (D) off shaft. Replace as an assembly if worn, damaged, or if problems were noted.



4. Inspect surface of shaft for pitting, grooves, or damage. Measure the outside diameter and compare to specifications. Replace the drive clutch assembly if shaft is worn or damaged.



= In. / mm.
Shaft Diameter: Standard: 1.3745” - 1.375” (34.91 - 34.93 mm) **Service Limit: 1.3730” (34.87 mm)**

5. Visually inspect VESPEL® thrust washers for damage. Measure the thickness and compare to specification. Replace if worn or damaged.

= In. / mm.
VESPEL® Washer Thickness **Standard: .030” (.76 mm)** **Service Limit: .025” (.64 mm)**

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Bushing Service

NOTE: Special Tools Required

EBS Clutch Bushing Tool Kit - 2201379

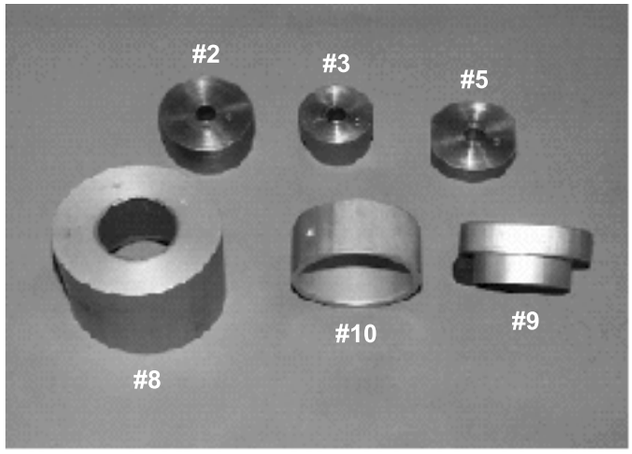
Item	Qty.	Part Description	Part #
A, B	1	EBS Puller Tool	5132027
C	1	EBS Puller Nut	5132501
D	1	EBS Main Adapter	5132029
E	1	EBS Bushing Removal Tool Instructions	5132028
–	1	Instructions	9915111

Additional Special Tools

Qty.	Part Description	Part #
1	Clutch Bushing Replacement Tool Kit	2871226
1	Piston Pin Puller	2870386

***Clutch Bushing Replacement Tool Kit (PN 2871226)**

Item	Qty.	Part Description	Part #
#2	1	P-90 Drive/Driven Clutch Bushing Install Tool	5020628
#3	1	Drive Clutch Cover Bushing Removal/ Installation Tool (all clutches)	5020629
#5	1	P-90 Driven Clutch Cover Bushing Removal Tool	5020631
#8	1	Main Puller Adapter	5020632
#9	1	Adapter Reducer	5010279
#10	1	Number Two Puller Adapter	5020633



NOTE: Bushings are installed at the factory using Loctite® 648. In order to remove bushings it will be necessary to apply heat evenly to the area around each bushing. Clean all residual Loctite® from bushing bore prior to installing new bushing.

CAUTION

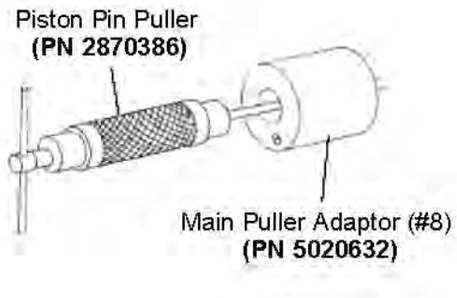
Clutch components will be hot! In order to avoid serious burns, wear insulated gloves during the removal process.

Moveable Sheave - Bushing Removal

1. Remove clutch as outlined previously in this chapter.
2. Install handle end of the Piston Pin Puller **(PN 2870386)** securely into bench vise and lightly grease puller threads.

Piston Pin Puller:
PN 2870386

3. Remove nut from puller rod and set aside.



4. Install puller adapter (Item 10 from kit **PN 2871226**).

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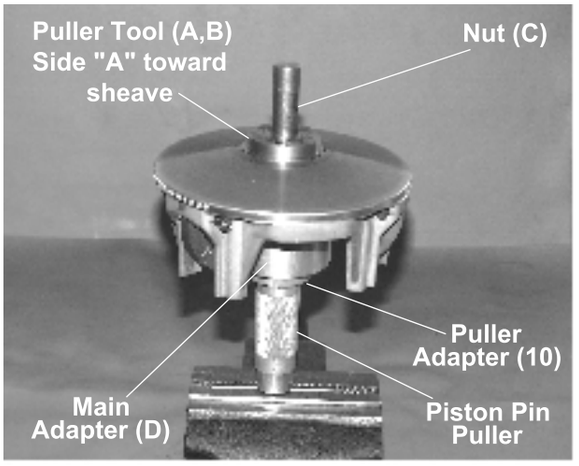
5. Install main adapter (Item D) onto puller.



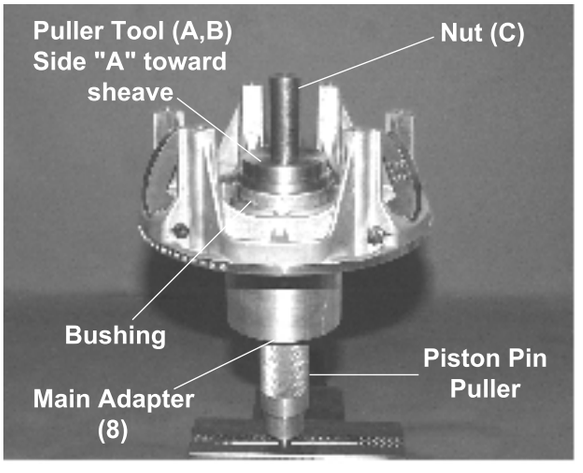
6. With towers pointing toward the vise, slide sheave onto puller rod.
7. Install removal tool (Item A, B) into center of sheave with “A side" toward sheave.

   NOTE: Use Bushing Tool PA-47336.

8. Install nut (C) onto end of puller rod and hand tighten. Turn puller barrel to increase tension on sheave if needed. Using a hand held propane torch, apply heat around outside of bushing until tiny smoke tailings appear.
9. Turn sheave counterclockwise on puller rod until it comes free. Lift sheave off puller.
10. Remove nut from puller rod and set aside.
11. Pull bushing removal tool and adapter from puller rod. Remove bushing from tool and discard.

    Drive Clutch Bushing Installation

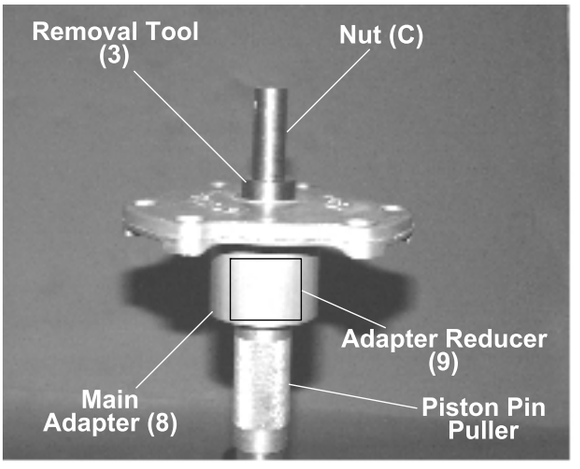
12. Place main adapter (Item 8) on puller.



13. Apply Loctite® 648 evenly to bushing bore inside moveable sheave.
14. Set bushing in place on sheave.
15. Insert installation puller tool (Item A/B) with “A” side down, into center of bushing.
16. **NOTE:** 800 EFI Clutch - Use **Bushing Tool PA-47336**.
17. With towers pointing upward, slide sheave, bushing and tool onto puller rod.
18. Install nut on puller rod and hand tighten. Turn barrel to apply additional tension if needed.
19. Turn sheave counterclockwise, making sure bushing is drawn straight into bore. Continue until bushing is seated.
20. Remove nut from puller rod and set aside.
21. Remove sheave from puller.
22. Remove installation tool.

    Cover Bushing Removal

23. Install main adapter (Item 8) on puller.



24. Install adapter reducer (Item 9).
25. From outside of clutch cover, insert removal tool (Item 3) into cover bushing.
26. With inside of cover toward vise, slide cover onto puller.
27. Install nut onto puller rod and hand tighten. Turn puller barrel to increase tension as needed.
28. Turn clutch cover counterclockwise on puller rod until bushing is removed and cover comes free.
29. Remove nut from puller rod and set aside.
30. Remove bushing and bushing removal tool from puller. Discard bushing.

    Cover Bushing Installation

31. Apply Loctite® 648 evenly to bushing bore in cover.
32. Working from inside of cover, insert new bushing and bushing installation tool into center of clutch cover.
33. With main adapter on puller, insert cover onto puller rod, placing outside of cover toward vise.
34. Install nut on rod and hand tighten. Turn puller barrel to apply more tension if needed.
35. Turn clutch cover counterclockwise on puller rod until bushing is seated.
36. Remove nut from puller rod. Take installation tool and clutch cover off rod.

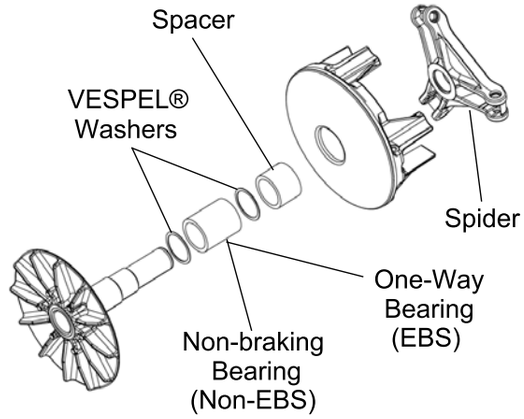
Clutch Assembly

NOTE: The Teflon bushings are self-lubricating.

CAUTION
Do not apply oil or grease to the bushings.

Reassemble the drive clutch in the following sequence. Be sure the “X”, or the marks that were made earlier are aligned during each phase of assembly.

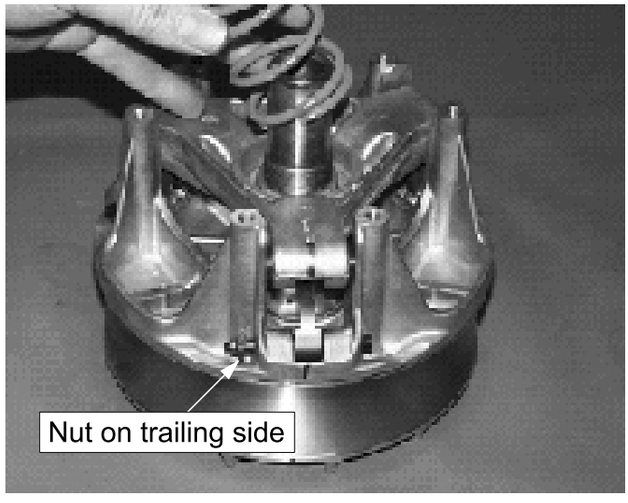
1. Install the VESPEL® washers and non braking bearing over the clutch shaft. There should be one fiber washer on each side of the bearing.
2. Install the moveable sheave and spacer onto the clutch shaft.



3. Compress spider buttons for each tower and install spider, making sure that “X”, or the marks that were made earlier, on spider aligns with “X”, or the marks that were made earlier, in moveable sheave.
4. Torque spider to specification using the holding fixture and spider tool. Torque with smooth motion to avoid damage to the stationary sheave.

= T
Spider: 210 ft-lbs (284 Nm)

5. Install shift weights using new lock nuts on the bolts.



6. Reinstall clutch spring.
7. Reinstall cover, aligning “X” mark with other marks.

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8. Torque cover bolts evenly to specification.

= T
Cover Screw: **100 in-lbs (12 Nm)**

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DRIVE CLUTCH BUSHING SERVICE (NON EBS AND EBS)

Bushing Service

IMPORTANT: Special Tools Required

EBS Clutch Bushing Tool Kit - 2201379

ITEM	QTY.	PART #	TOOL DESCRIPTION
A, B	1	5132027	EBS Puller Tool
C	1	5132501	EBS Puller Nut
D	1	5132029	EBS Main Adapter
E	1	5132028	EBS Bushing Removal Tool Instructions
–	1	9915111	Instructions

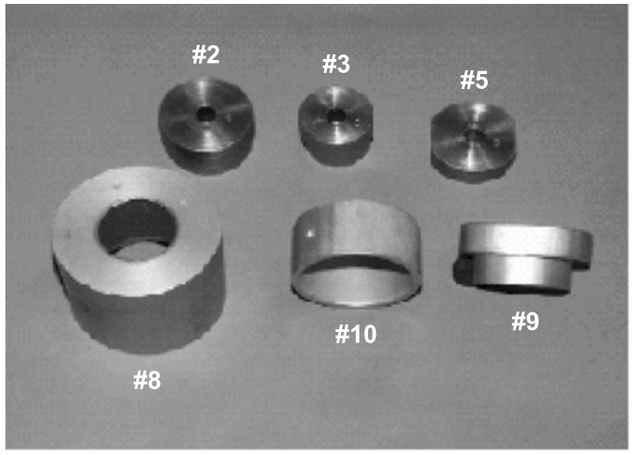
Additional Special Tools

QTY.	PART #	TOOL DESCRIPTION
1	2871226	Clutch Bushing Replacement Tool Kit
1	2870386	Piston Pin Puller

***Clutch Bushing Replacement Tool Kit (PN 2871226**)

ITEM	QTY.	PART #	TOOL DESCRIPTION
#2	1	5020628	P-90 Drive/Driven Clutch Bushing Install Tool
#3	1	5020629	Drive Clutch Cover Bushing Removal/ Installation Tool (all clutches)
#5	1	5020631	P-90 Driven Clutch Cover Bushing Removal Tool
#8	1	5020632	Main Puller Adapter
#9	1	5010279	Adapter Reducer
#10	1	5020633	Number Two Puller Adapter

Bosch Automotive Service Solutions: 1-800-328-6657 or http://polaris.service-solutions.com



NOTE: Bushings are installed at the factory using Loctite™. In order to remove bushings it will be necessary to apply heat evenly to the area around each bushing. Clean all residual Loctite™ from bushing bore prior to installing new bushing.

⚠ CAUTION

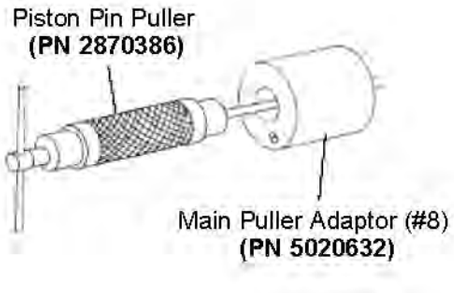
Clutch components will be hot! In order to avoid serious burns, wear insulated gloves during the removal process.

Moveable Sheave - Bushing Removal

1. Remove clutch as outlined previously in this chapter.
2. Install handle end of the Piston Pin Puller **(PN 2870386)** securely into bench vise and lightly grease puller threads.

Piston Pin Puller (PN 2870386)

3. Remove nut from puller rod and set aside.



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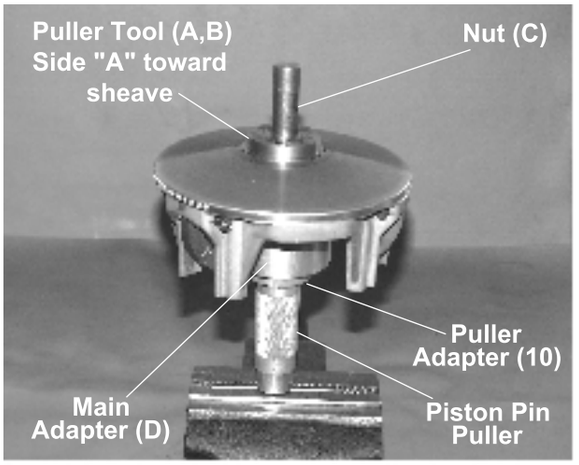
4. Install puller adapter (Item 10 from kit **PN 2871226**).
5. Install main adapter (Item D) onto puller.



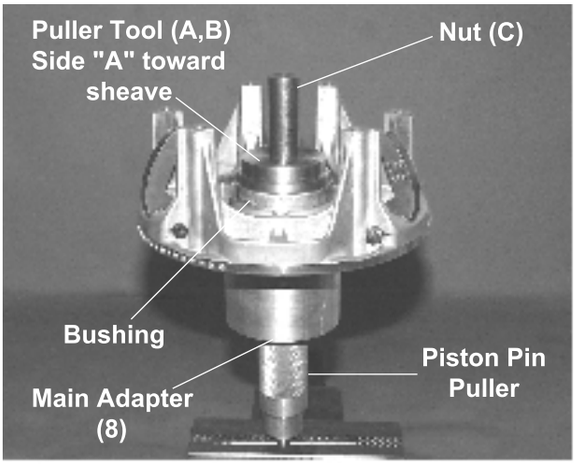
6. With towers pointing toward the vise, slide sheave onto puller rod.
7. Install removal tool (Item A, B) into center of sheave with “A side" toward sheave.

   NOTE: Use Bushing Tool PA-47336.

8. Install nut (C) onto end of puller rod and hand tighten. Turn puller barrel to increase tension on sheave if needed. Using a hand held propane torch, apply heat around outside of bushing until tiny smoke tailings appear.
9. Turn sheave counterclockwise on puller rod until it comes free. Lift sheave off puller.
10. Remove nut from puller rod and set aside.
11. Pull bushing removal tool and adapter from puller rod. Remove bushing from tool and discard.

Drive Clutch Bushing Installation

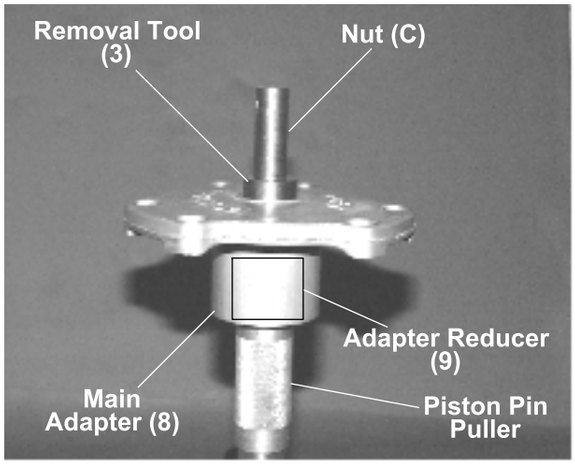
12. Place main adapter (Item 8) on puller.



13. Apply Loctite® 648 evenly to bushing bore inside moveable sheave.
14. Set bushing in place on sheave.
15. Insert installation puller tool (Item A/B) with “A” side down, into center of bushing.
16. Use **Bushing Tool PA-47336**.
17. With towers pointing upward, slide sheave, bushing and tool onto puller rod.
18. Install nut on puller rod and hand tighten. Turn barrel to apply additional tension if needed.
19. Turn sheave counterclockwise, making sure bushing is drawn straight into bore. Continue until bushing is seated.
20. Remove nut from puller rod and set aside.
21. Remove sheave from puller.
22. Remove installation tool.

Cover Bushing Removal

23. Install main adapter (Item 8) on puller.



24. Install adapter reducer (Item 9).
25. From outside of clutch cover, insert removal tool (Item 3) into cover bushing.
26. With inside of cover toward vise, slide cover onto puller.
27. Install nut onto puller rod and hand tighten. Turn puller barrel to increase tension as needed.
28. Turn clutch cover counterclockwise on puller rod until bushing is removed and cover comes free.
29. Remove nut from puller rod and set aside.
30. Remove bushing and bushing removal tool from puller. Discard bushing.

Cover Bushing Installation

31. Apply Loctite® 648 evenly to bushing bore in cover.
32. Working from inside of cover, insert new bushing and bushing installation tool into center of clutch cover.
33. With main adapter on puller, insert cover onto puller rod, placing outside of cover toward vise.
34. Install nut on rod and hand tighten. Turn puller barrel to apply more tension if needed.
35. Turn clutch cover counterclockwise on puller rod until bushing is seated.
36. Remove nut from puller rod. Take installation tool and clutch cover off rod.

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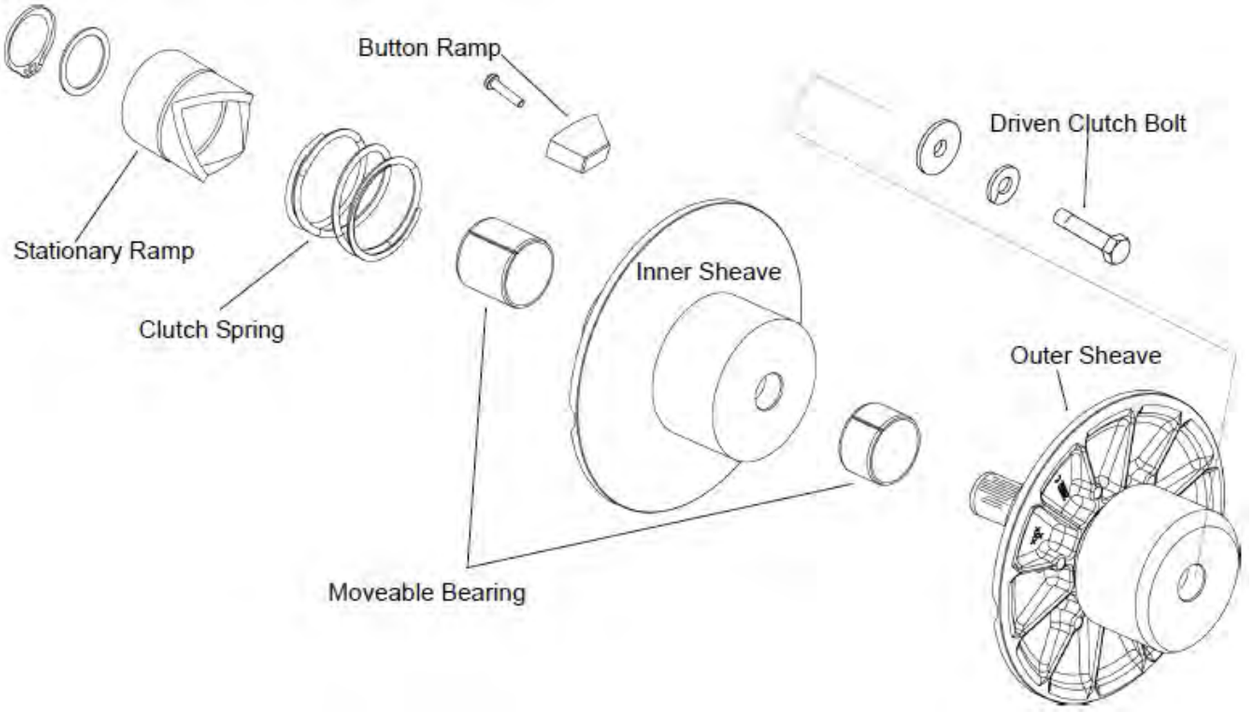
DRIVEN CLUTCH SERVICE (NON EBS)

Exploded View



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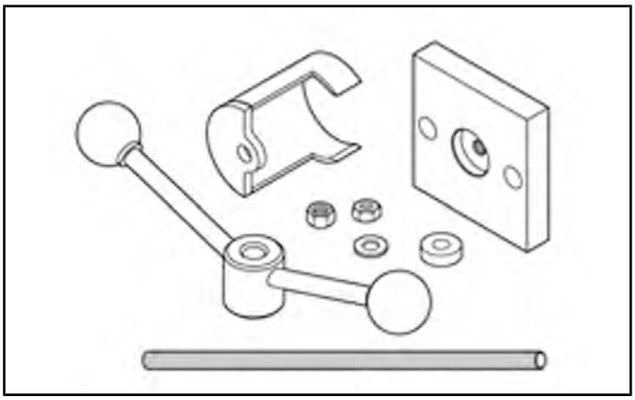
Clutch Disassembly / Inspection

1. Place the clutch into the Universal Clutch Compressor Tool **PU-50518**. Press down on the top of the spider assembly, pushing the spider onto the shaft. Remove snap ring and slowly release the assembly.



⚠ CAUTION

Wear eye protection when removing snap ring to prevent serious personal injury.

2. Remove snap ring retainer.
3. Note the location of the spring and remove helix.
4. Note the location of the spring in the moveable sheave, and remove the spring.

5. Check alignment of tabs on spring. Replace the spring if tabs are misaligned or the spring coils are distorted.
6. Inspect ramp buttons in the moveable sheave and replace if worn.

NOTE: The ramp buttons are secured by Torx™ screws (T20).

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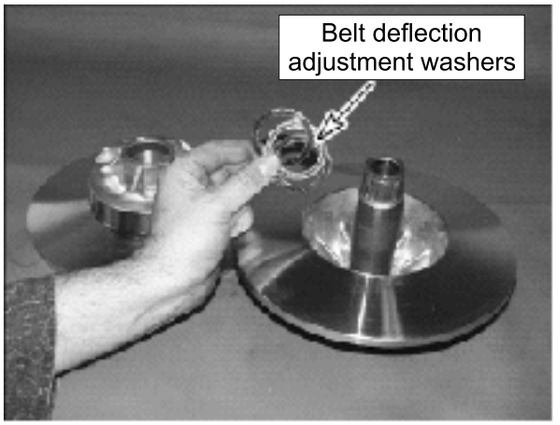
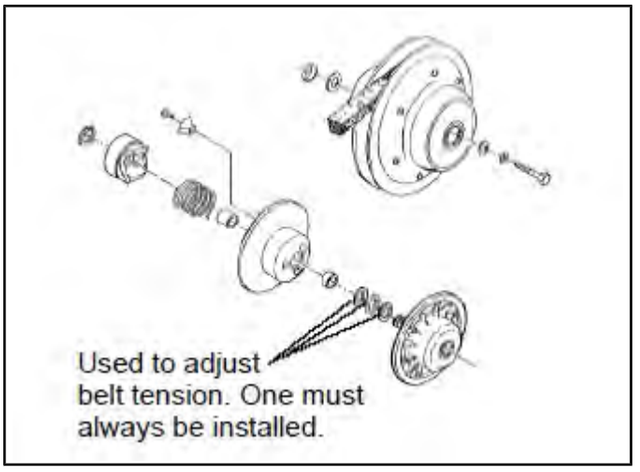
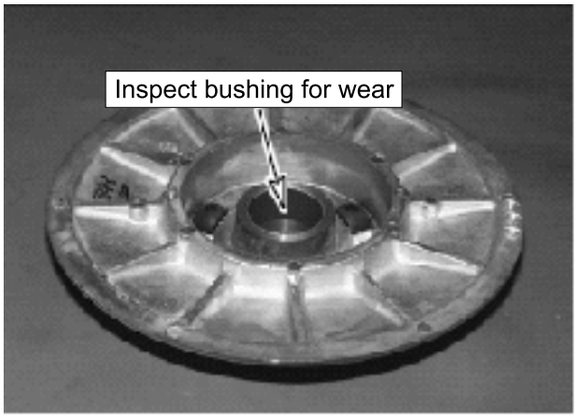
7. Remove moveable sheave and note the number of spacer washers. One spacer must remain between the sheaves when adjusting belt deflection.





8. Inspect the Teflon™ coating on the moveable sheave bushing.



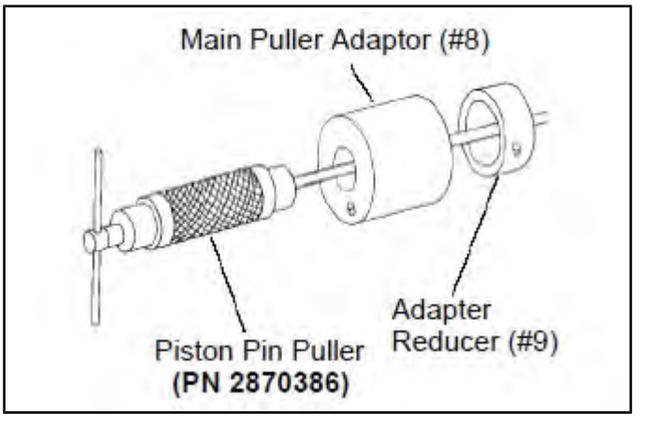
Moveable Sheave Bushing Inspection: Replace the bushing if more brass than Teflon™ is visible on the bushing. Refer to the "Bushing Service" section.

9. Inspect driven clutch faces for wear or damage.
10. Clean and inspect splines on helix and transmission input shaft.
11. Lube splines with a light film of grease. Do not lubricate the bushings!

Bushing Service

Bushings are installed at the factory using Loctite™. In order to remove the bushing it will be necessary to apply heat. A press can be used to remove and install some of the bushings. Be sure to support the sheave or cover as close as possible to the bushing bore when using a press.

1. Install Main Puller Adapter (#8) (PN 5020632) onto the Piston Pin Puller (PN 2870386).



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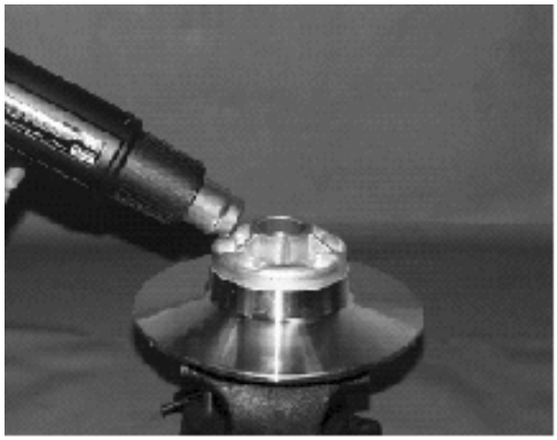
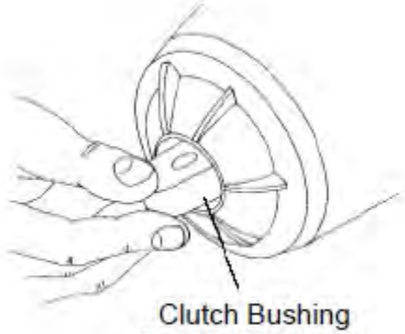
2. Insert Adapter Reducer (#9) (PN 5010279) onto the puller, sliding it inside the main adapter.
3. Remove ramp buttons from moveable sheave.



4. Using a heat gun, apply heat directly on bushing until tiny smoke tailings appear. This loosens the thread locking agent, allowing for fastener removal.

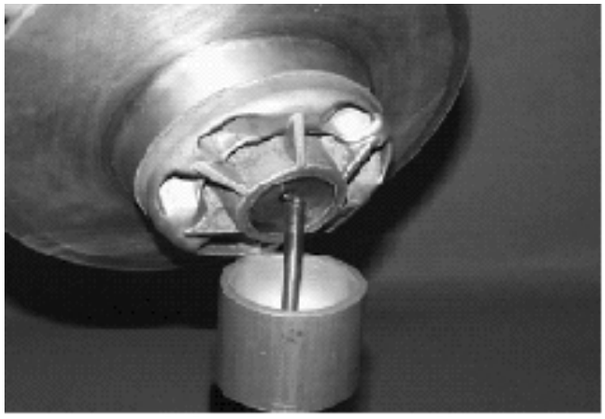
⚠ CAUTION

Clutch components will be hot! In order to avoid serious burns, wear heat resistant insulated gloves for the rest of the removal process.



Clutch Bushing Removal Tool (#5)

5. Working from the top, install Driven Clutch Bushing Removal Tool (#5) (PN 5020631) into the center of clutch sheave with smaller diameter toward bushing to be removed. See illustration.



6. Install sheave onto puller.
7. Install nut onto puller rod and tighten by hand. Turn puller barrel for further tension if needed.
8. Turn clutch sheave counterclockwise until bushing is removed. Repeat Steps 5 - 8 for other bushing.

9. Remove nut from puller rod and set aside.
10. Remove adapters from puller.
11. Remove bushing and removal tool from adapters. Discard bushing.

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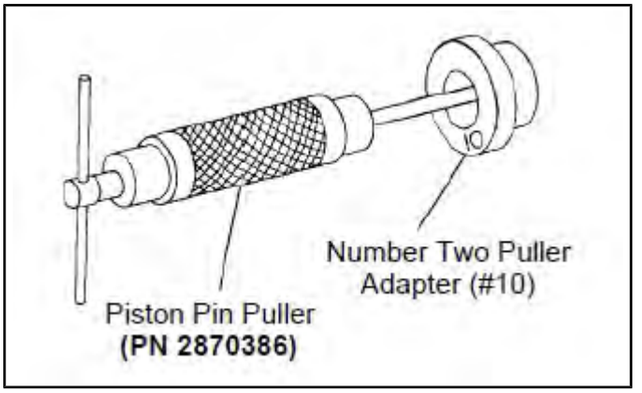
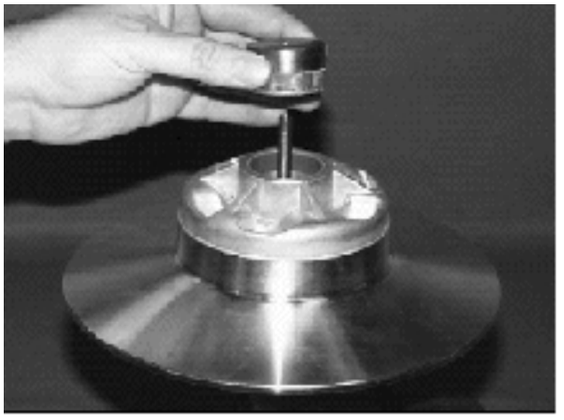
Moveable Sheave - Bushing Installation

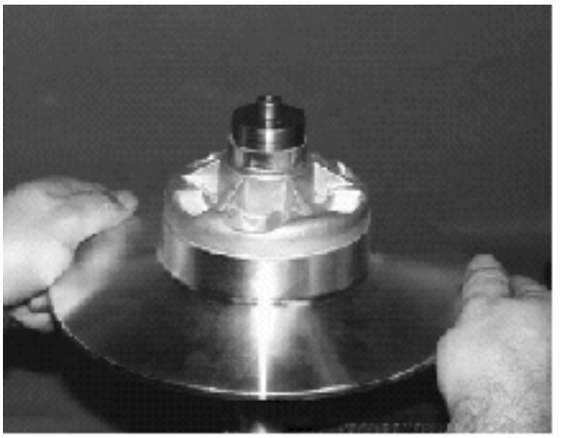
1. Working from the top, insert Puller Adapter (#10) (PN 5020633) onto the puller.



2. Start new bushing evenly in moveable sheave. Apply Loctite™ 680 to the back side of new bushing.



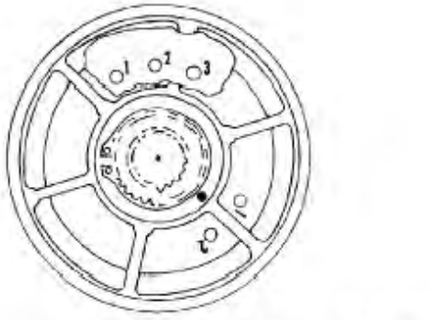
3. Install sheave onto puller with new bushing upward as shown. Install Puller Adapter (#10) (PN 5020633).
4. Install nut onto puller rod and hand tighten against installation tool.
5. Turn clutch sheave counterclockwise until bushing is seated.



6. Remove nut from puller rod and set aside.
7. Remove installation tool and clutch sheave from puller.

8. Repeat installation procedure for other moveable bushing.
9. Install new ramp buttons into the sheave. Apply thread locking agent to the fasteners. Install fasteners and tighten securely.

Clutch Assembly

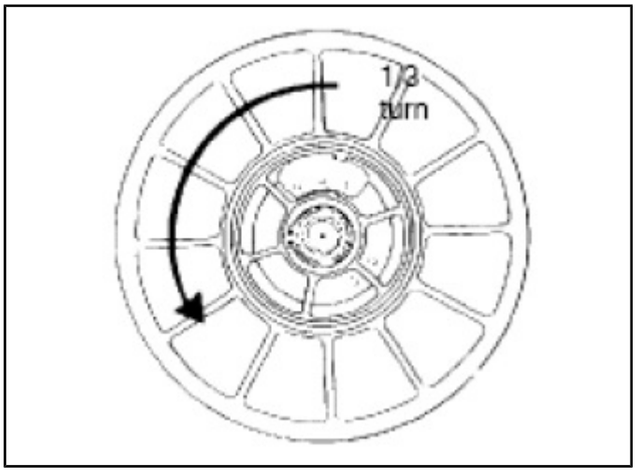


Example:	Helix	Moveable Sheave	Spring Tension
	2 -	1	Heavy
Spring/	2 -	2	
Position	1 -	1	
	2 -	3	
	1 -	2	
	1 -	3	Soft

1. Install moveable sheave with spacer washers. Important: At least one spacer washer must be installed. Teflon™ bushings are self-lubricating. Do not apply oil or grease to the bushings.
2. Install spring, inserting spring tab into proper hole in moveable sheave.
3. Insert spring tab into proper hole in helix.

   The driven clutch helix/moveable assembly has several different spring locations which affect clutch shifting and RPMs. The greatest amount of spring tension will raise engine RPMs during clutch upshift and allow quicker backshift or downshift when pulling or negotiating a hill, for example. The least amount of tension will create a slower downshift and a harder upshift.
4. Line up boss spline and push helix down until it engages the splines 1/2" to 3/4".

5. While holding downward pressure on helix, wind moveable sheave counterclockwise approximately 1/3 turn (120°).



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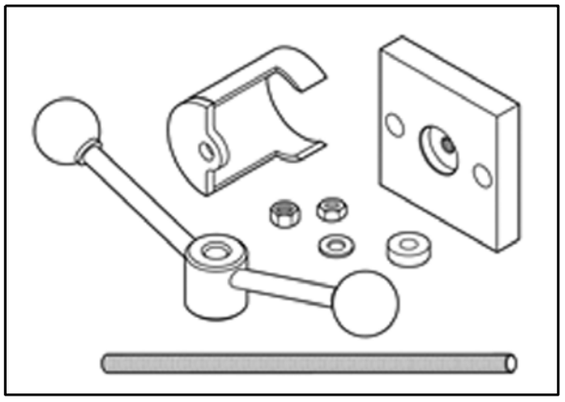
6. Place the clutch into the Universal Clutch Compressor Tool **PU-50518**. Press down on the top of the spider assembly, pushing the spider onto the shaft. Install snap ring and slowly release the assembly.



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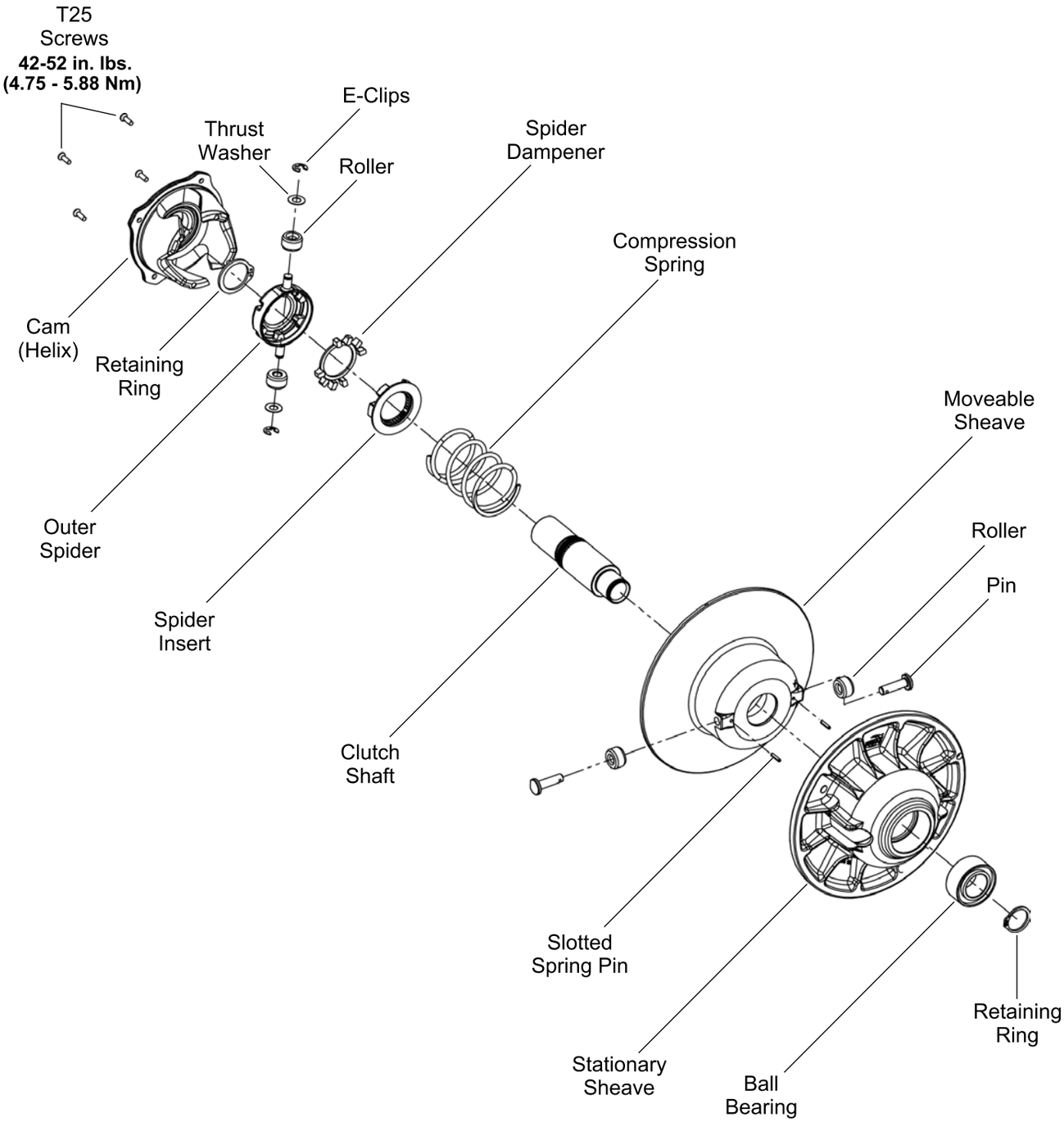
DRIVEN CLUTCH SERVICE (EBS)

Exploded View



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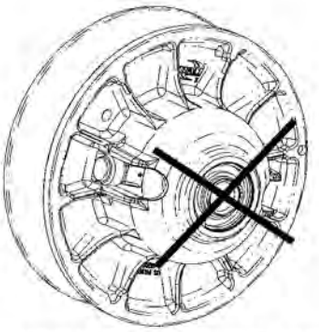
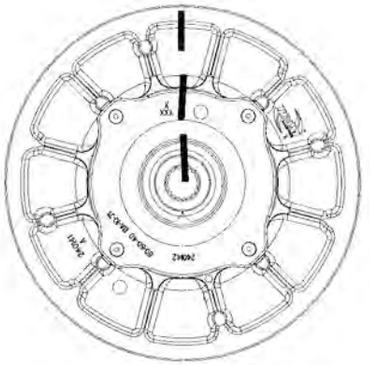
Clutch Disassembly

1. Remove driven clutch from the transmission input shaft. Do not attempt disassembly of the driven clutch from the outside snap ring. The driven clutch must be disassembled from the helix side.

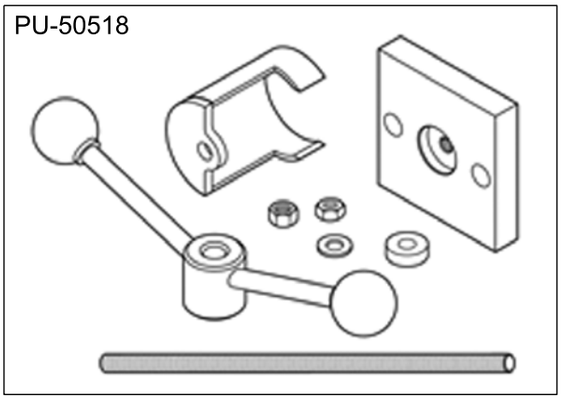


2. It is important to mark the position of the shaft, cam cover and sheave before disassembly or use the X's on the components for reference. This will aid in assembly and maintains clutch balance.

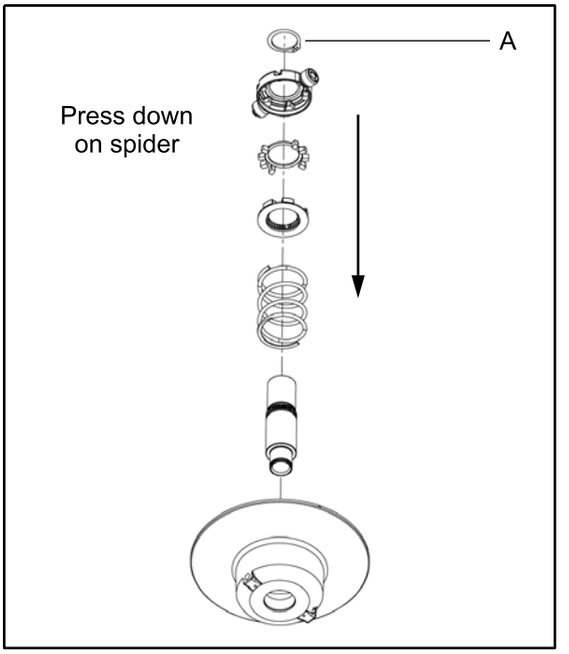


3. Remove the four screws that secure the cam (helix) assembly using a T25 Torx driver.

4. Place the driven clutch into the Universal Clutch Compressor **PU-50518**.

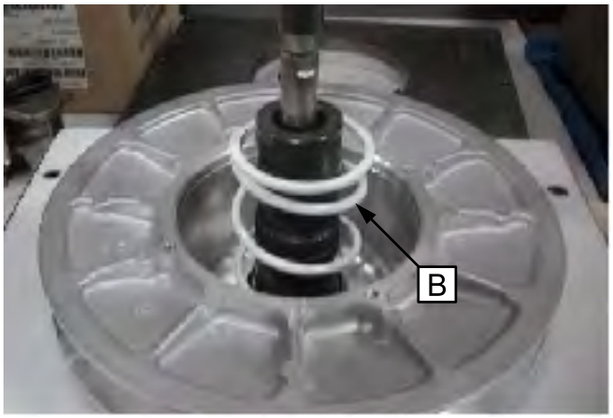


5. Press down on the top of the spider assembly, pushing the spider onto the shaft. Remove snap ring (A) and slowly release the assembly.

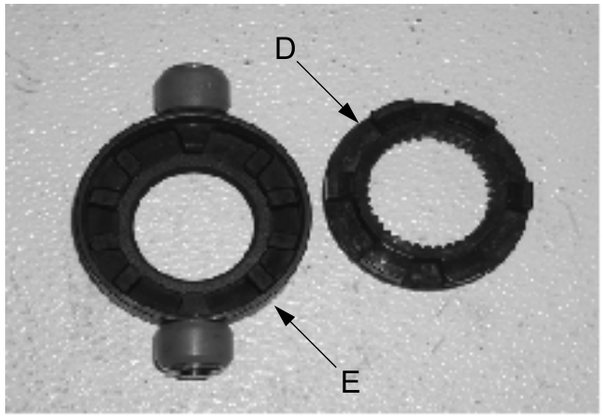


6. Remove the spider assembly and spring (B).

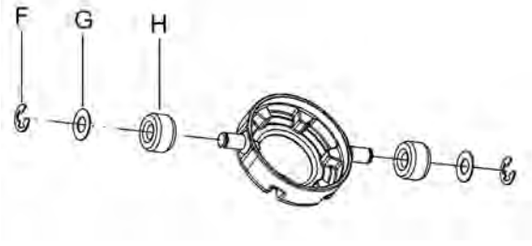
   NOTE: Spring is compression only and has no torsional wind.



7. Remove the inside spider plate (D) and spider dampener (E). Inspect the spider dampener (E) for wear and replace if needed.

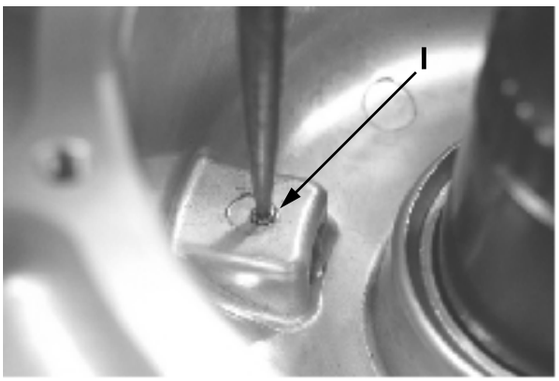


8. Remove the E-clips (F), washers (G), and the clutch rollers (H). Inspect the rollers for wear; replace if worn.

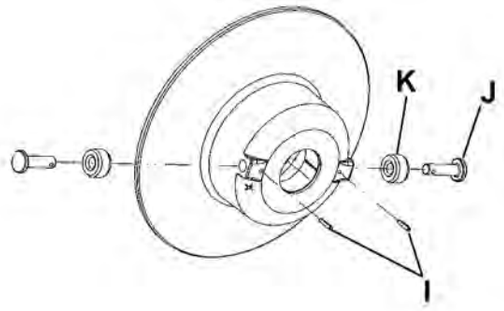


9. Remove the clutch assembly from the holding tool.

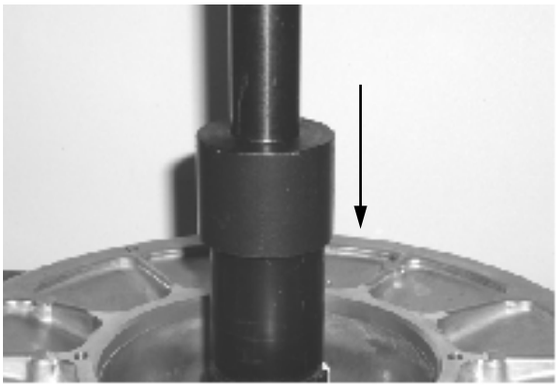
10. Press out the spring pins (I) in the inner sheave.



11. Pull out the clutch roller pins (J) and rollers (K).



12. Press the shaft and bearing out of the outer sheave using an arbor press.



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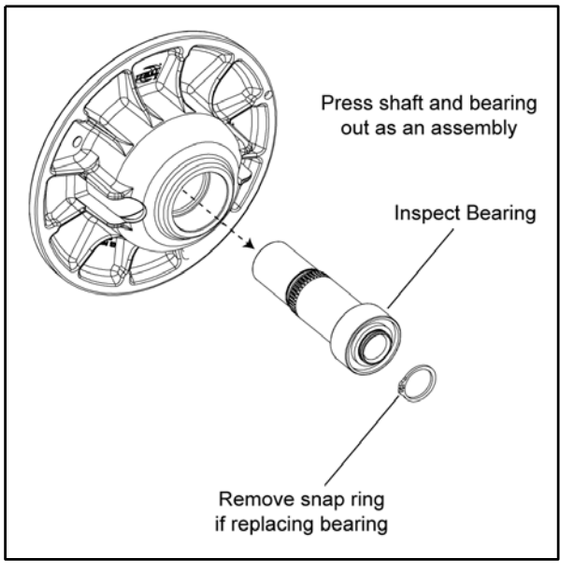
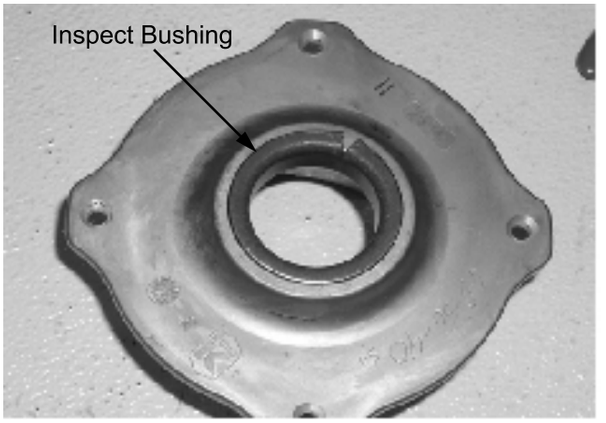
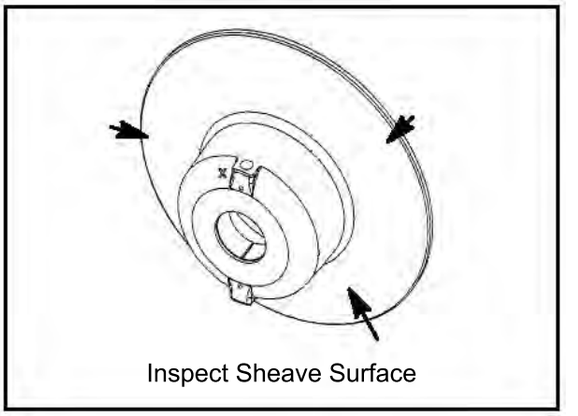
13. Inspect the bearing for wear. Spin the bearing, if the bearing does not spin smoothly, replace it. To replace the bearing, remove the snap ring from the end of the shaft and press the bearing off the shaft.



14. Inspect the cam (helix) assembly bushing for wear. If the bushing is worn or the shaft does not fit snug into the bushing, replace the cam (helix) assembly.



15. Inspect the sheaves for excessive wear or damage.



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Bushing Service

NOTE: Special Tools Required

EBS Clutch Bushing Tool Kit - 2201379

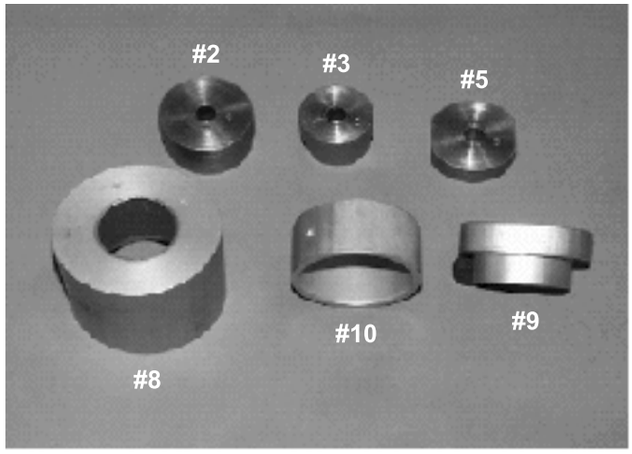
Item	Qty.	Part Description	Part #
A, B	1	EBS Puller Tool	5132027
C	1	EBS Puller Nut	5132501
D	1	EBS Main Adapter	5132029
E	1	EBS Bushing Removal Tool Instructions	5132028
–	1	Instructions	9915111

Additional Special Tools

Qty.	Part Description	Part #
1	Clutch Bushing Replacement Tool Kit	2871226
1	Piston Pin Puller	2870386

***Clutch Bushing Replacement Tool Kit (PN 2871226)**

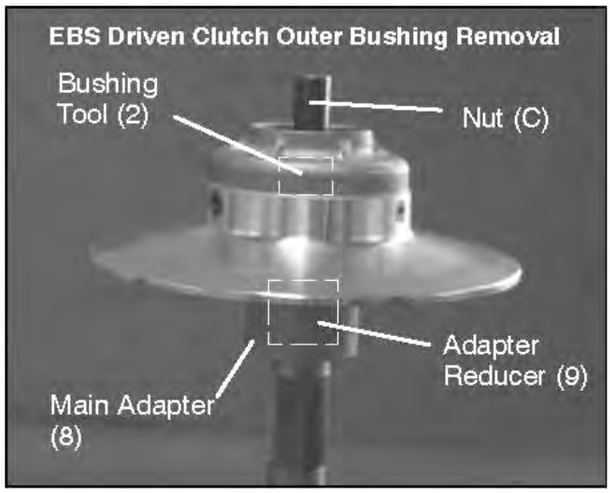
Item	Qty.	Part Description	Part #
#2	1	P-90 Drive/Driven Clutch Bushing Install Tool	5020628
#3	1	Drive Clutch Cover Bushing Removal/ Installation Tool (all clutches)	5020629
#5	1	P-90 Driven Clutch Cover Bushing Removal Tool	5020631
#8	1	Main Puller Adapter	5020632
#9	1	Adapter Reducer	5010279
#10	1	Number Two Puller Adapter	5020633



NOTE: Bushings are installed at the factory using Loctite® 609. In order to remove bushings it will be necessary to apply heat evenly to the area around each bushing. Clean all residual Loctite® from bushing bore prior to installing new bushing.

Clutch Bushing Removal

1. Install main puller adapter (Item 8) onto puller.
2. Install adapter reducer (Item 9).
3. Using a hand held propane torch, apply heat around outside of bushing until tiny smoke tailings appear.
4. Flip sheave over so bushing faces downward and install onto puller.
5. Install bushing tool (Item 2).



6. Install left hand nut (C) and spacer onto puller rod and tighten by hand. Turn puller barrel for further tension if needed.
7. Turn clutch sheave counterclockwise until bushing is removed and sheave comes free.

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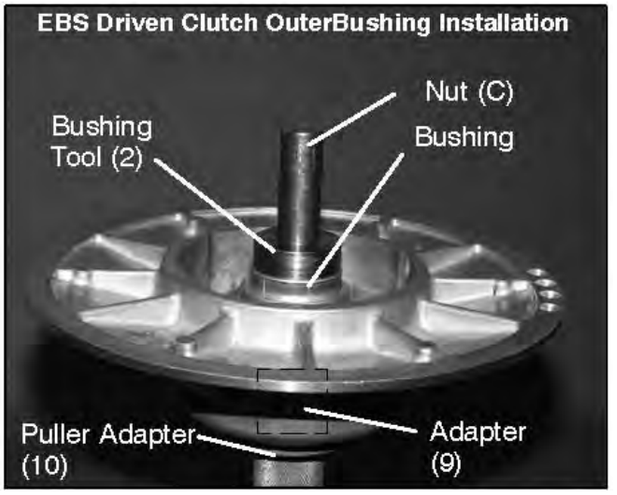
8. Remove nut (C) (left hand thread) from puller rod and set aside.
9. Remove adapters from puller.
10. Remove bushing and removal tool from adapters. Discard bushing.

Clutch Bushing Installation

11. Install puller adapter (Item 10) onto puller.
12. Install adapter (Item 9) onto puller.



13. Apply Loctite® 609 evenly to bushing bore inside moveable sheave.
14. Install sheave face down on puller.
15. Install new bushing on installation tool (Item 2) and install assembly into sheave.
16. Install left hand thread nut (C) onto puller rod and hand tighten against installation tool.
17. Turn clutch sheave counterclockwise, making sure bushing is drawn straight into bore. Continue until bushing is seated.
18. Remove nut (C) from puller rod and set aside.
19. Remove installation tool and clutch sheave from puller.

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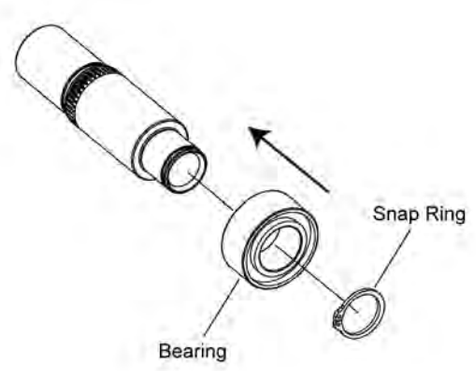
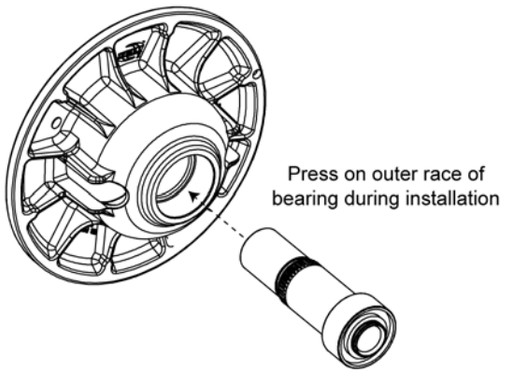
Clutch Assembly

1. Install a new bearing onto the clutch shaft using an arbor press. Once bearing is fully seated, install a new snap ring.

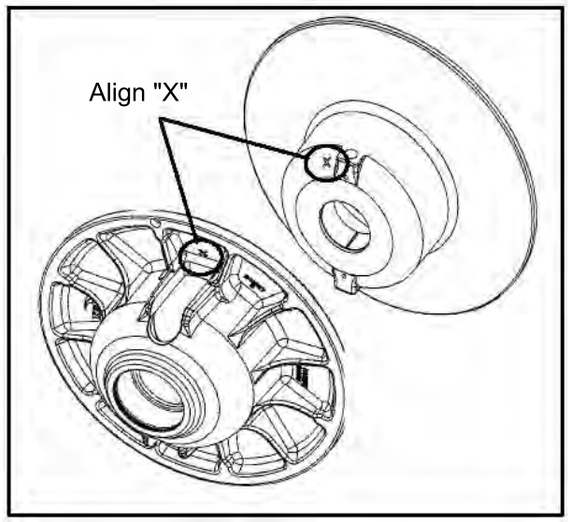


2. Install the shaft and bearing assembly into the outer sheave.

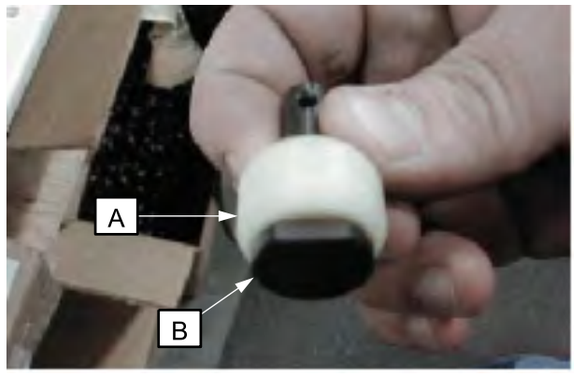


NOTE: Press only on the outer race of the bearing during installation to prevent damaging the bearing.

3. Line up the “X” on the moveable sheave with the “X” on the stationary sheave or use the marks previously used. Put the sheaves together.



4. Install the roller (A) onto the roller pin (B) on both sides.



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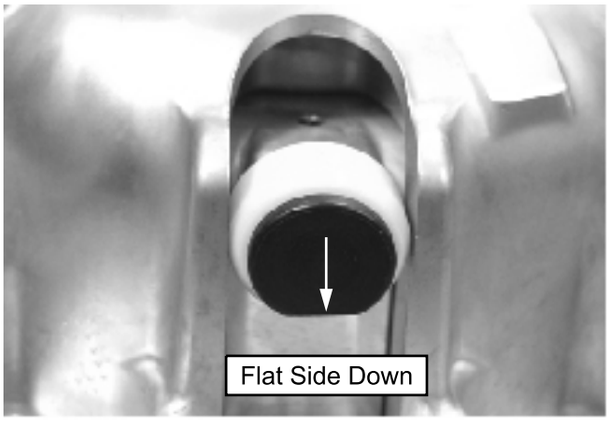
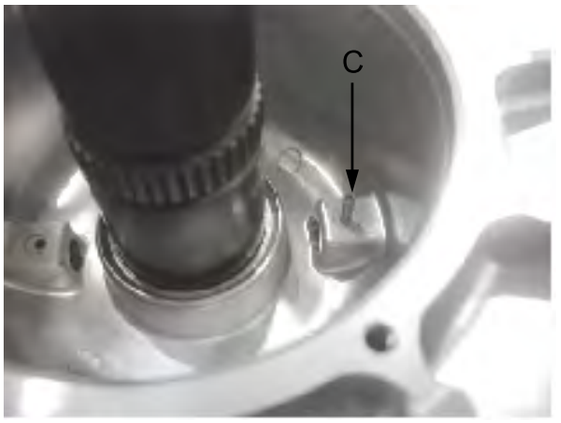
5. Install the roller pin into the sheave assembly on both sides. The flat side of the roller pin faces downward when the shaft side is laying flat on the bench.



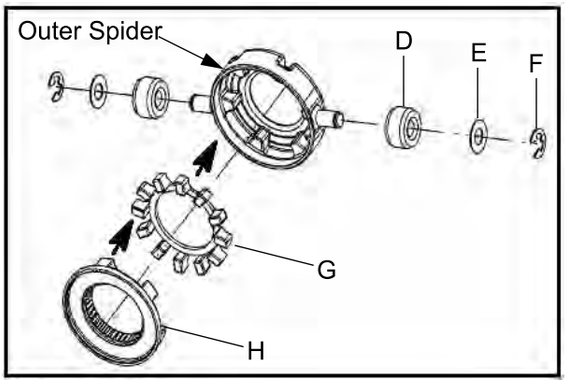
6. Install the spring pins (C) to secure the roller pins. Install until flush with sheave surface.



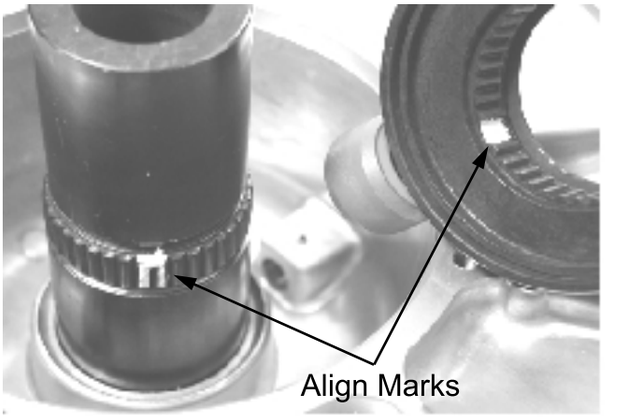
7. Install the spring over the shaft.

8. Install the clutch rollers (D) onto each side of the outside spider. Install the washers (E) and E-clips (F) to secure the rollers. The rollers should spin freely.

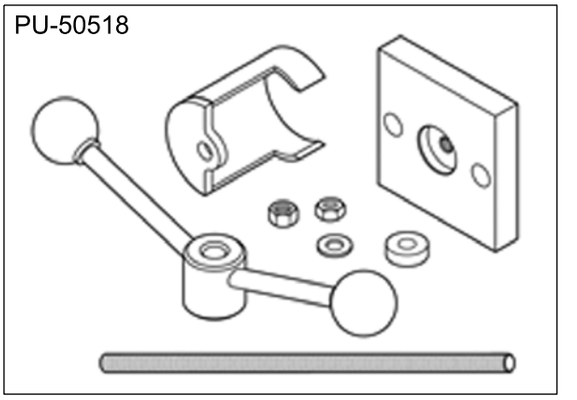
9. Install the spider dampener (G) inside the outer spider and install the inside spider plate (H).



10. Install the spider assembly onto the shaft with the retaining ring on top of the spider. **NOTE:** Use the marks previously made to align the skip tooth spider, or use the “X” on top of the spider and align it with the skip tooth on the shaft.



11. Place the driven clutch into the Universal Clutch Compressor **PU-50518**.



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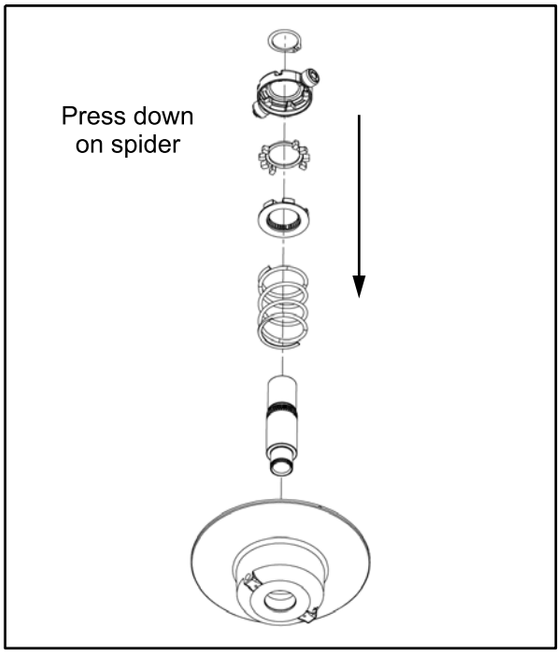
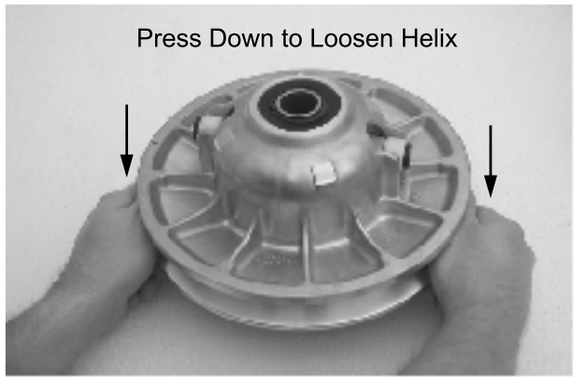
12. Press down on the top of the spider assembly, pushing the spider onto the shaft.



13. Slowly compress the spider into place. If the spider appears to bind while compressing, stop and make sure the skip-tooth on the shaft and the spider are aligned. Once the spider passes the retaining ring notch on the shaft, install the retaining ring.

14. Install the cam (helix) assembly over the shaft. Line up the “X” on the cam, “X” on spider, and “X” on the stationary sheave or use the marks previously made before disassembly. **NOTE:** If the cam assembly (helix) is difficult to install, be sure the sheaves are aligned. To align the sheaves place the clutch assembly on a flat surface with the cam assembly (helix) side down. Press down on the moveable sheave belt face with both hands and the helix will release.



15. Use a T25 Torx driver to install the four helix retaining screws and torque to specification.

= T
Helix Retaining Screws: **42-52 in. lbs. (4.75 - 5.88 Nm)**

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DRIVEN CLUTCH BUSHING SERVICE

Bushing Service (NON EBS and EBS)

IMPORTANT: Special Tools Required

EBS Clutch Bushing Tool Kit - 2201379

ITEM	QTY.	PART DESCRIPTION	PART #
A, B	1	EBS Puller Tool	5132027
C	1	EBS Puller Nut	5132501
D	1	EBS Main Adapter	5132029
E	1	EBS Bushing Removal Tool Instructions	5132028
–	1	Instructions	9915111

Additional Special Tools

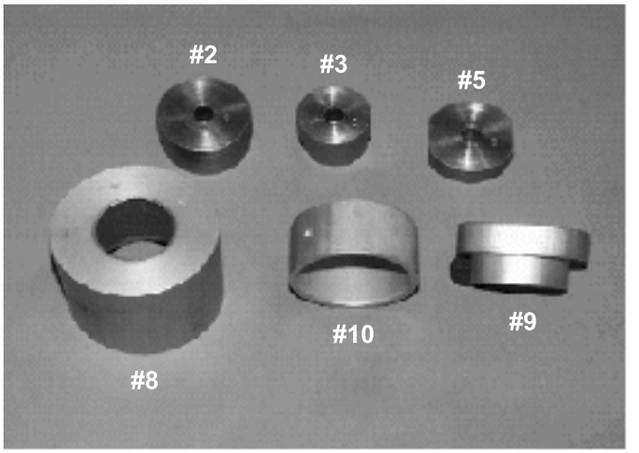
QTY.	PART DESCRIPTION	PART #
1	Clutch Bushing Replacement Tool Kit	2871226
1	Piston Pin Puller	2870386

***Clutch Bushing Replacement Tool Kit (PN 2871226)**

ITEM	QTY.	PART DESCRIPTION	PART #
#2	1	P-90 Drive/Driven Clutch Bushing Install Tool	5020628
#3	1	Drive Clutch Cover Bushing Removal/ Installation Tool (all clutches)	5020629
#5	1	P-90 Driven Clutch Cover Bushing Removal Tool	5020631
#8	1	Main Puller Adapter	5020632
#9	1	Adapter Reducer	5010279
#10	1	Number Two Puller Adapter	5020633

Bosch Automotive Service Solutions- 1-800-328-6657 or

http://polaris.service-solutions.com

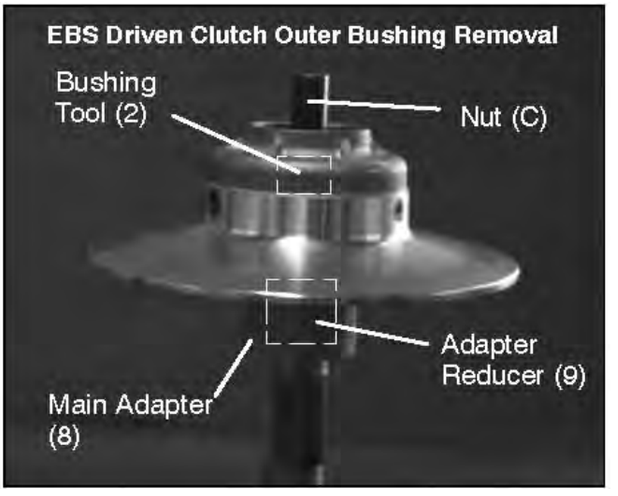


NOTE: Bushings are installed at the factory using Loctite® 648. In order to remove bushings it will be necessary to apply heat evenly to the area around each bushing. Clean all residual Loctite™ from bushing bore prior to installing new bushing.

Clutch Bushing Removal

Clutch components will be hot! In order to avoid serious burns, wear insulated gloves during the removal process.

1. Install main puller adapter (Item 8) onto puller.
2. Install adapter reducer (Item 9).
3. Using a hand held propane torch, apply heat around outside of bushing until tiny smoke tailings appear.
4. Flip sheave over so bushing faces downward and install onto puller.
5. Install bushing tool (Item 2).



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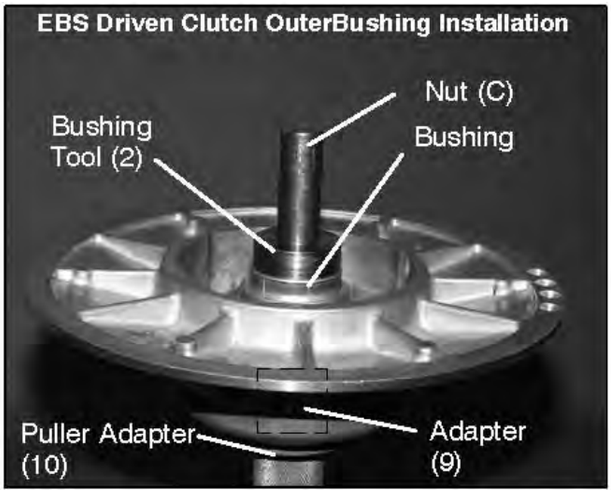
6. Install left hand nut (C) and spacer onto puller rod and tighten by hand. Turn puller barrel for further tension if needed.
7. Turn clutch sheave counterclockwise until bushing is removed and sheave comes free.
8. Remove nut (C) (left hand thread) from puller rod and set aside.
9. Remove adapters from puller.
10. Remove bushing and removal tool from adapters. Discard bushing.

Clutch Bushing Installation

11. Install puller adapter (Item 10) onto puller.
12. Install adapter (Item 9) onto puller.



13. Apply Loctite® 648 evenly to bushing bore inside moveable sheave.
14. Install sheave face down on puller.
15. Install new bushing on installation tool (Item 2) and install assembly into sheave.
16. Install left hand thread nut (C) onto puller rod and hand tighten against installation tool.
17. Turn clutch sheave counterclockwise, making sure bushing is drawn straight into bore. Continue until bushing is seated.
18. Remove nut (C) from puller rod and set aside.
19. Remove installation tool and clutch sheave from puller.

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TROUBLESHOOTING

SITUATION	PROBABLE CAUSE	REMEDY
Engine RPM below specified operating range, although engine is properly tuned.	-Wrong or broken drive clutch spring. -Drive clutch shift weight too heavy. -Driven clutch spring broken or installed in wrong helix location.	-Replace with recommended spring. -Install correct shift weight kit to match engine application. -Replace spring; refer to proper installation location.
Erratic engine operating RPM during acceleration or load variations.	-Drive clutch binding. -Belt worn unevenly - thin / burnt spots. -Driven clutch malfunction. -Sheave face grooved.	A. Disassemble drive clutch; inspect shift weights for wear and free operation. B. Clean and polish stationary shaft hub; reassemble clutch without spring to determine problem area. -Replace belt. A. Replace ramp buttons. B. Inspect movable sheave for excessive bushing clearance. -Replace the clutch.
Engine RPM above specified operating range.	-Incorrect drive clutch spring (too high spring rate). -Drive clutch shift weights incorrect for application (too light). -Drive clutch binding. -Driven clutch binding. -Converter sheaves greasy; belt slipage.	-Install correct recommended spring. -Install correct recommended shift weights. -Disassemble and clean clutch, inspecting shift weights and rollers. Reassemble without the spring and move sheaves through entire range to further determine probable cause. -Disassemble, clean, and inspect driven clutch, noting worn sheave bushing and ramp buttons and helix spring location. -Clean sheaves with denatured alcohol or brake cleaner, install new belt.
Harsh drive clutch engagement.	-Drive belt worn too narrow. -Excessive belt / sheave clearance with new belt.	-Replace belt. -Perform belt / sheave clearance adjustment with shim washers beneath spider.
Drive belt turns over	-Wrong belt for application. -Clutch alignment out of spec. -Engine mount broken or loose.	-Replace with correct belt. -Adjust clutch alignment. -Inspect / adjust or replace.
Belt burnt, thin spots	-Abuse (continued throttle application when vehicle is stationary, excess load) -Dragging brake -Slow, easy clutch engagement	-Caution operator to operate machine within guidelines. -Vehicle operated with park brake on. Inspect brake system. -Fast, effective use of throttle for efficient engagement.

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Troubleshooting, Continued.....

SITUATION	PROBABLE CAUSE	REMEDY
PVT cover overheating (melting)	-Plugged air intake or outlet. -Belt slippage due to water, oil, grease, etc., rubbing on cover. -Clutches or weight being applied to cover while in operation. -High vs. low range.	-Clear obstruction -Inspect system. Clean , repair or replace as necessary. Seal PVT system ducts.-Remove weight. Inform operator. -Instruct operator on guidelines for operation in proper driving range for different terrain as outlined in Owner's Safety and Maintenance Manual.
Water ingestion	-Cover seals or ducts leaking -Operator error	-Find leak and repair as necessary. -Instruct operator on guidelines for operation in wet terrain as outlined in Owner's Safety and Maintenance Manual.
Belt slippage	-Belt worn out -Water ingestion -Belt contaminated with oil or grease	-Replace belt. -Inspect and seal PVT system. -Inspect and clean.
PVT noise	-Belt worn or separated, thin spots, loose belt -Broken or worn clutch components, cover hitting clutches	-Replace belt. -Inspect and repair as necessary.
Engagement erratic or stabby	-Thin spots on belt, worn belt -Drive clutch bushings stick	-Replace belt. Refer to belt burnt troubleshooting and instruct operator. -Inspect and repair clutches.

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NOTES

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CHAPTER 7
FINAL DRIVE

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GENERAL INFORMATION

Torque Table

COMPONENT	FT-LBS (IN-LBS)	NM
Front Gearcase Mount Bolts	37	50
Lower Hub Carrier Bolts	37	50
Upper Hub Carrier Bolts	37	50
AWD Cover Screws	7 - 11	9.4 - 14.9
Front Gearcase Mount Bolts	30	41
Standard Gearcase Screws	14	19
Rear Gearcase Mount Bolts	30	41
Rear Gearcase Bolts	25	34
Lower Hub Carrier Bolts	37	50
Upper Hub Carrier Bolts	37	50

NOTE: Verify which type of wheel ATV is equipped with (aluminum or steel) when torquing wheel nuts.

ITEM	SPECIFICATION
Steel - Front and Rear Wheel Nuts	27 ft-lbs (37 Nm)
Aluminum - Front and Rear Wheel Nuts	30 ft-lbs + 1/4 Turn (41 Nm + 1/4 Turn)
Front Hub Retaining Nut	60 ft-lbs (81 Nm)
Rear Hub Retaining Nut	80 ft-lbs (108 Nm)

Special Tools

PART NUMBER	TOOL DESCRIPTION
2872608	Roller Pin Removal Tool
8700226 or PU-48951	CV Boot Clamp Tool
2870772	1 3/4” Straight Wrench
2872608	Roller Pin Removal Tool
8700226 or PU-48951	CV Boot Clamp Pliers
PA-48542	ADC Gearcase Piston Installation Tool

Bosch Automotive Service Solutions: 1-800-328-6657 or polaris.service-solutions.com

Gearcase Fluid / Capacity

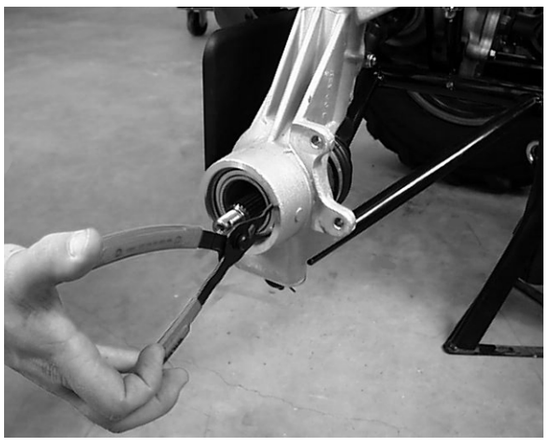
GEARCASE	DESCRIPTION
Centralized Hilliard	Demand Drive Hub Fluid **8.97 oz. (265 ml)**
Middle Gearcase	AGL Synthetic or ADF **13.5 oz. (400 ml)**
Rear Gearcase	AGL Synthetic or ADF **5.0 oz. (150 ml)**

FRONT HUB

Disassembly

NOTE: Follow steps 1-10 for wheel/hub removal in 'Front Drive Shaft (CV) Service / Removal'

1. Remove outer snap ring.



2. From the back side, tap on the outer bearing race with a drift punch in the reliefs as shown.

NOTE: Drive bearing out evenly by tapping on outer race only. Once bearing is at bottom of casting, support casting on outer edges so bearing can be removed.

3. Inspect the bearing.

NOTE: Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. While rotating bearings by hand, inspect for rough spots, discoloration, or corrosion. The bearings should turn smoothly and quietly, with no detectable up and down movement and minimal movement sideways between inner and outer race.

4. Inspect bearing housing for scratches, wear or damage. Replace housing if damaged.

Assembly

1. Support bottom of hub strut housing.
2. Start bearing in housing.
3. Press bearing into place until outer race bottoms on housing.

CAUTION

When using an arbor press be sure to press only on the outer race to avoid bearing damage.

4. Install snap ring into groove.

NOTE: Follow steps 2-6 for wheel/hub installation in 'Front Drive Shaft (CV) Service / Installation'

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FRONT GEARCASE REMOVAL AND INSTALLIATION

Gearcase Removal

1. Stop engine, place machine in Park and set parking brake.
2. Properly raise and support vehicle.

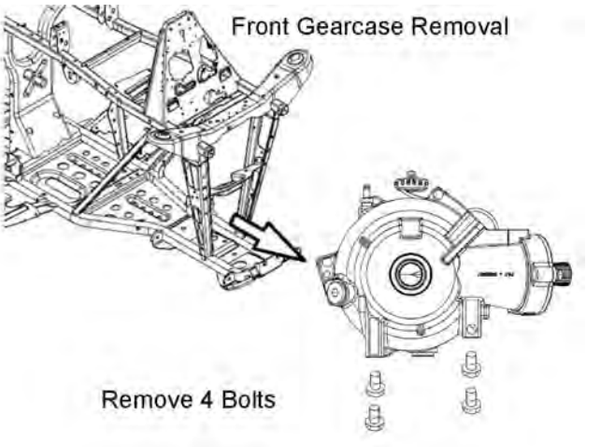
CAUTION

Serious injury may result if machine tips or falls. Be sure machine is secure before beginning this service procedure. Wear eye protection when removing and installing bearings and seals.

3. Remove the left front wheel nuts and wheel.
4. Remove cotter pins, lower ball joint nuts and A-arms from the ball joints.

5. Pull the hub and strut assembly out and pull the drive-shaft out of the gearcase.

6. Remove the roller pin from the front prop shaft. Use the Roller Pin Removal Tool (**PN 2872608**).
7. Remove bolts securing the bottom of housing to the skid plate frame. Bolts and fluid drain plug are accessible through the skid plate.



8. Remove vent line and disconnect the electrical connector.
9. Remove the front gearcase from left side of frame, pulling both the remaining CV shaft and propshaft from the gearcase. Replace the circlips on the CV shaft ends prior to reassembly.

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Gearcase Installation

1. To install gearcase, reverse removal procedures. Use a new roll pin in front prop shaft.
2. Torque mounting bolts in skid plate to specification.

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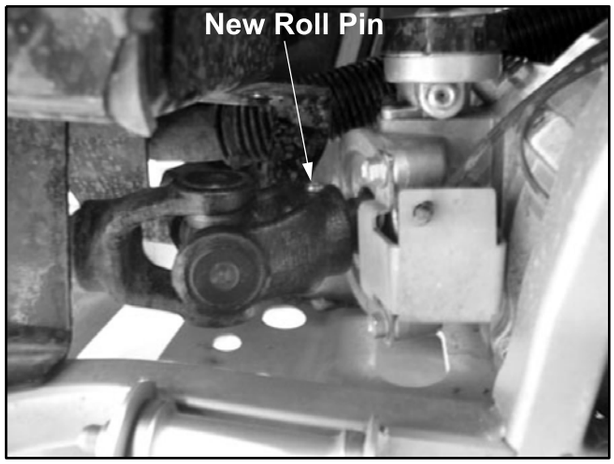
Gearcase Mounting Bolt: **37 ft-lbs (50 Nm)**



3. Add the proper lubricant to the front gearcase. Check drain plug for proper torque. Refer to Chapter 2 for fluid fill and change information.

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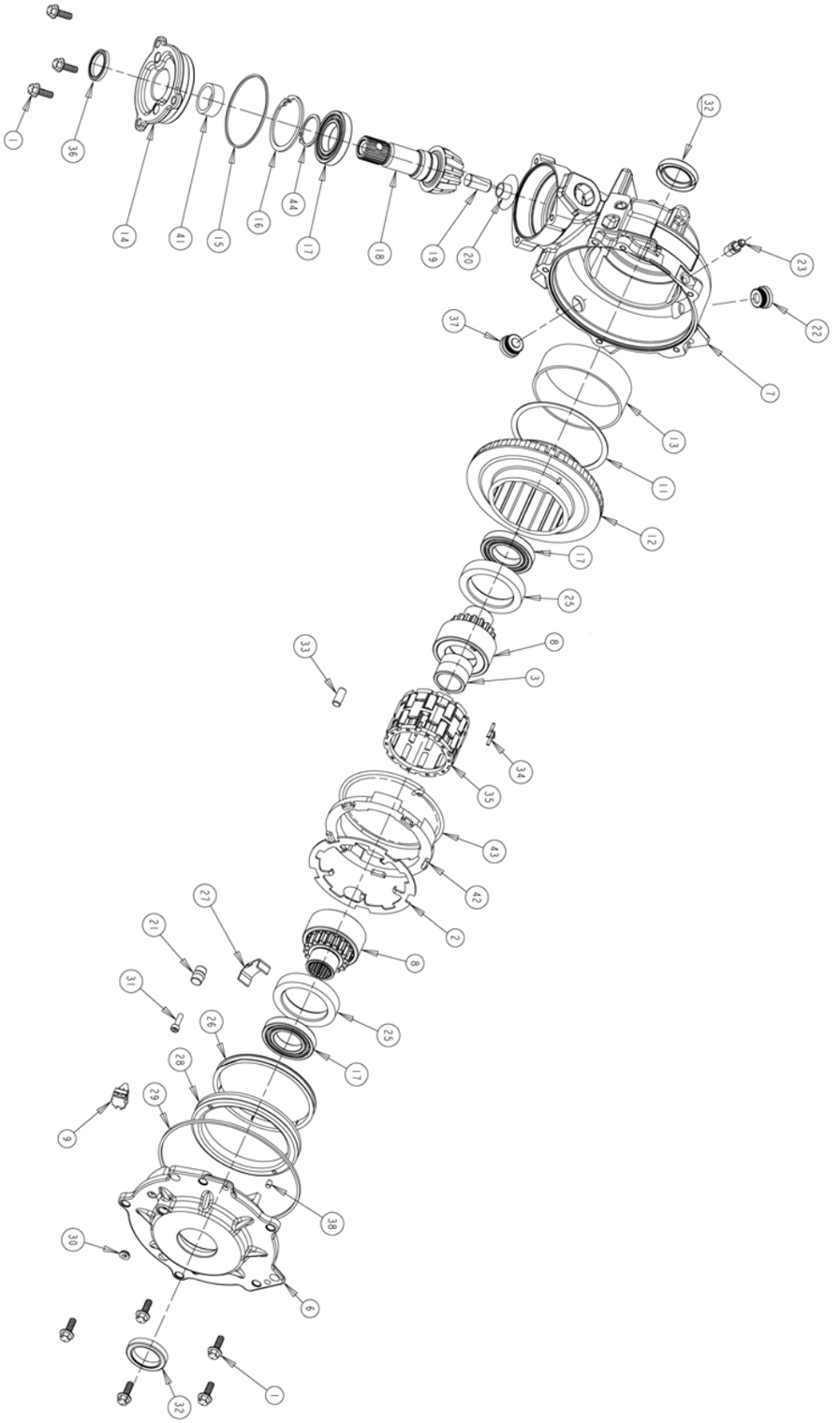
FRONT GEARCASE (NON-ADC)

Exploded view



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REF#	DESCRIPTION	QTY
1	Screw: **TORQUE 7-11 ft-lbs (10-13 Nm)**	8
2	Armature Plate	1
3	Bushing	1
6	Output Cover	1
7	Gearcase	1
8	Hub	2
11	Gear Spacer	1
12	Ring Gear Assembly	1
13	Bushing (non serviceable, see parts book)	1
14	Input Cover	1
15	O-ring (square style)	1
16	Retaining Ring	1
17	Ball Bearings	3
18	Pinion Gear	1
19	Dowel Pin	1
20	Bearing (non serviceable, see parts book)	1
21	Thrust Button Asm.	1
22	Fill Plug: **TORQUE 8-30 ft-lbs (11-40 Nm)**	1
23	Vent Tube	1

REF#	DESCRIPTION	QTY
25	Spacer	2
26	AWD Coil	1
27	Thrust Plate	1
28	Coil Pocket Insert (non serviceable, see parts book)	1
29	O-ring (square style)	1
30	Grommet (non serviceable, see parts book)	1
31	Screw	1
32	Oil Seal	2
33	Roller	20
34	H-Clip	20
35	Roll Cage	1
36	Oil Seal	1
37	Drain Plug: **TORQUE 8-30 ft-lbs (11-40 Nm)**	1
38	Dowl Pin (non serviceable, see parts book)	1
41	Needle Bearing (non serviceable, see parts book)	1
42	Spring Retainer	1
43	Torsion Spring	1
44	Retaining Ring	1

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Operation

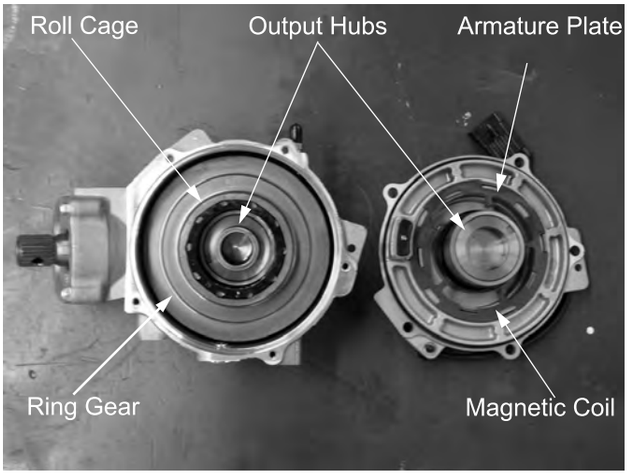
The AWD switch may be turned on or off while the vehicle is moving, however, AWD will not enable until the engine RPM drops below 3100. Once the AWD is enabled, it remains enabled until the switch is turned off.

Engage the AWD switch before getting into conditions where the front wheel drive may be needed. If the rear wheels are spinning, release the throttle before switching to AWD.

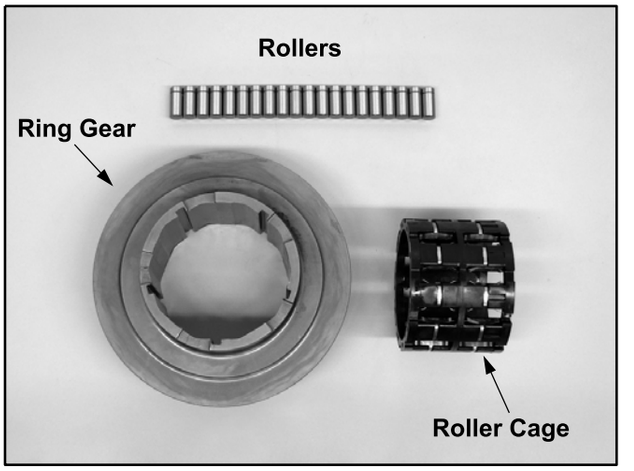
⚠ CAUTION

Switching to AWD while the rear wheels are spinning may cause severe drive shaft and gearcase damage. Always switch to AWD while the rear wheels have traction or are at rest.

With the AWD switch off, the vehicle drives through the rear wheels only (2 wheel drive). When the AWD is enabled, the front drive acts as an on-demand AWD system. This means, the front drive will engage once the rear wheels have lost traction, and will remain engaged until the torque requirement goes away (i.e. rear wheels regain traction).



AWD Engagement: When the AWD switch is activated, the AWD coil is powered by a 12 Vdc input which creates a magnetic field. This magnetic field attracts an armature plate that is keyed to the roll cage. When the ring gear and roll cage are spinning (vehicle is moving), the energized coil and armature plate will apply drag to the roll cage that indexes the rollers inside the ring gear to an engagement position. While in the engagement position, the front drive will be in an “over-running” condition (not engaged), until the rear wheels lose traction. Once the rear wheels begin to lose traction, the front drive will engage by coupling the output hubs to the ring gear via the rollers. The front drive will remain engaged until the torque requirement goes away (i.e. rear wheels regain traction).



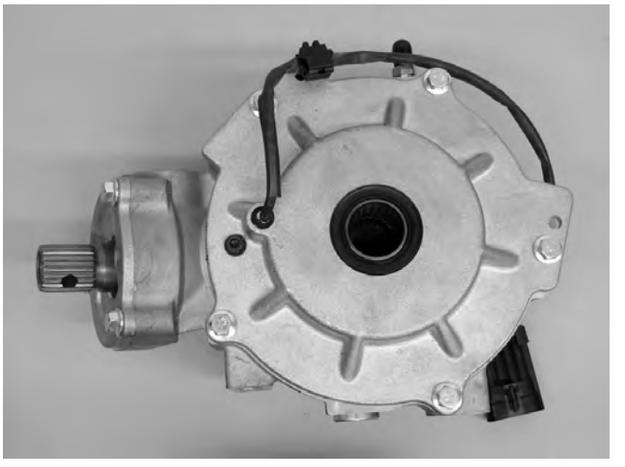
⚠ CAUTION

If the rear wheels are spinning, release the throttle before turning the AWD switch on. If AWD is engaged while the wheels are spinning, severe drive shaft and clutch damage could result.

AWD Disengagement: Once the rear wheels regain traction, the front wheels will return to the “over-running” condition. The vehicle is now back to rear wheel drive until the next loss of rear wheel traction occurs.

Disassembly / Inspection

1. Drain and properly dispose of used oil. Remove any metal particles from the drain plug magnet.
2. Remove bolts retaining the outer cover plate assembly.



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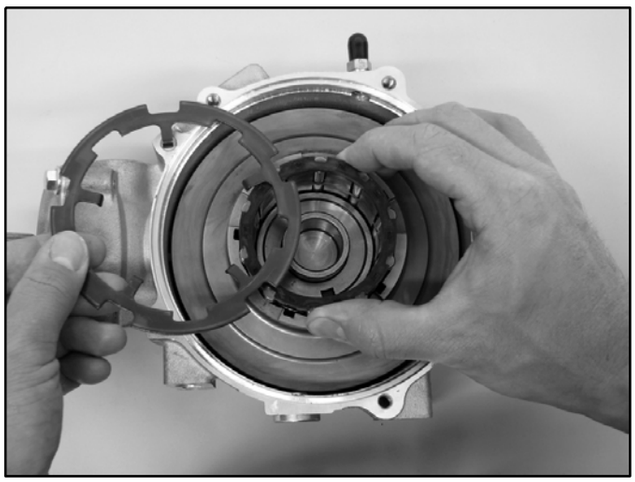
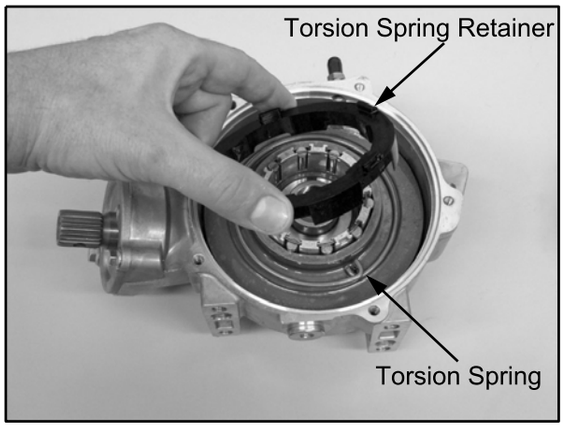
3. Remove the outer cover plate assembly.

4. Remove the output hub assembly from the outer cover plate. Inspect the bearing and contact surfaces of the output hub for signs of wear or damage. Replace component if found to be worn or damaged

5. Remove and inspect the armature plate. Refer to “Troubleshooting, Front Gearcase (NON-ADC)” for detailed inspection process.



6. Remove the torsion spring retainer and torsion spring from the top of the ring gear.



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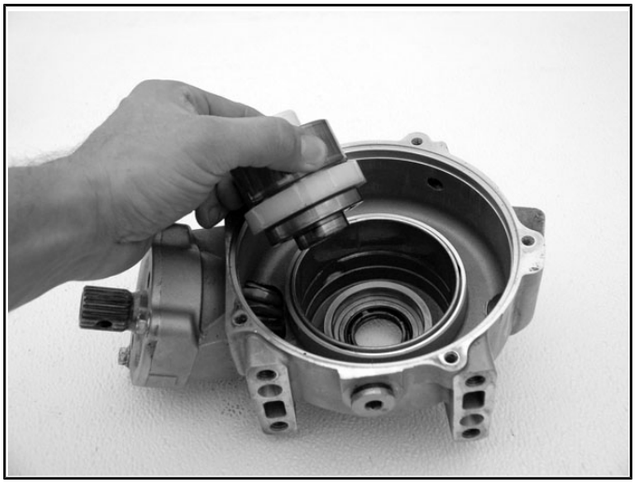
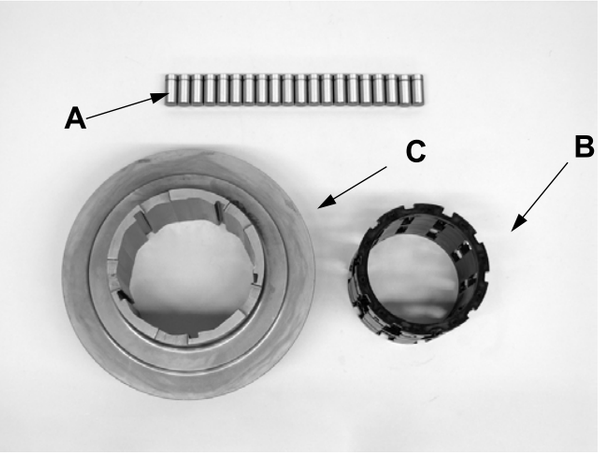
7. Remove the roll cage assembly, rollers, and ring gear. Inspect for wear.

8. Remove the LH output hub. Inspect the bearing and contact surfaces of the output hub for signs of wear or damage. Replace component if found to be worn or damaged.

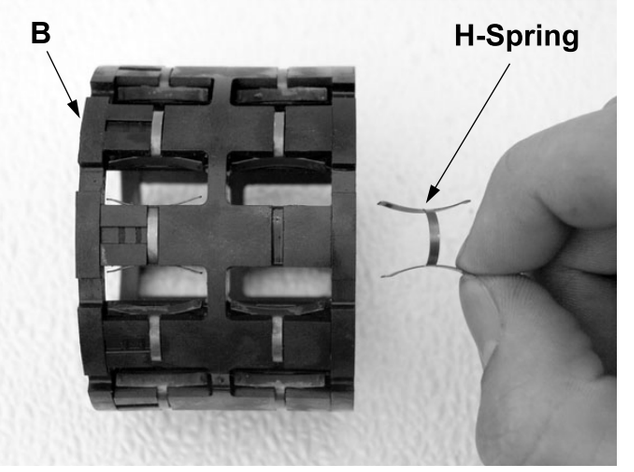


9. Thoroughly clean all parts. Inspect the bearing surfaces of the output hub. Inspect the rollers (A) for nicks, scratches and flat spots. Inspect the roll cage (B) for damage or cracks. The rollers must slide up and down freely within the roller cage surfaces.



10. Inspect the ring gear (C) for inconsistent wear patterns or damage. The surfaces should be free of nicks or burrs.

11. Inspect roll cage (B) sliding surface. This surface must be clean and free of nicks, burrs or scratches. **Inspect the H-springs, but do not remove them from the roll cage.**



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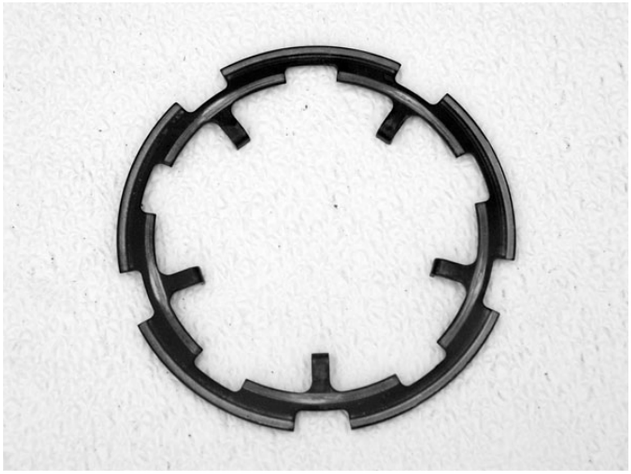
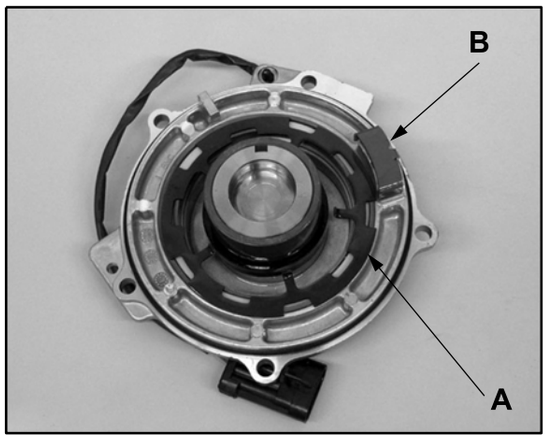
12. Inspect the armature plate for a consistent wear pattern. Uneven wear of the armature plate indicates a warped plate, which may cause intermittent operation.

    NOTE: See "Troubleshooting, Front Gearcase (NON-ADC)" later in this chapter for more details.



13. Inspect the magnetic coil (A) in the outer cover plate assembly. Inspect the backlash pad (B) for excessive wear.

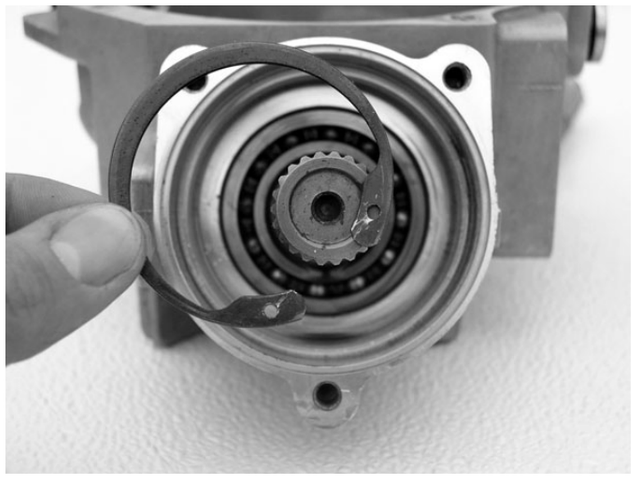


    NOTE: See "Troubleshooting, Front Gearcase (NON-ADC)" later in this chapter for more details on the coil.

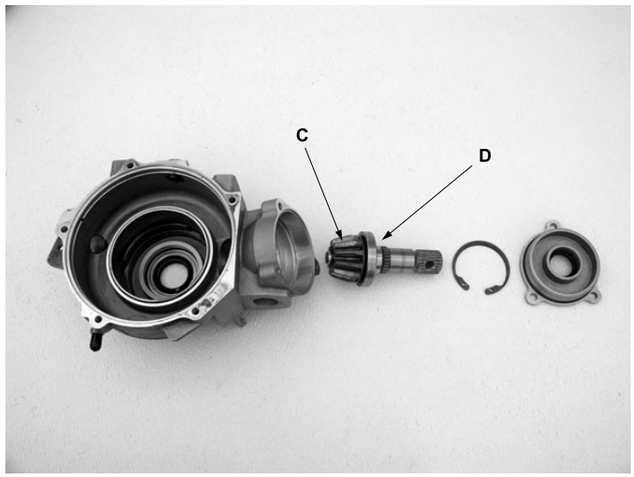
    The backlash for the centralized hilliard is set at the factory. No adjustment is required, unless the front cover is replaced, or the back lash pad screw is removed. See the "FRONT GEARCASE ASSEMBLY" procedure later in this chapter for details on backlash setting.

14. Remove the bolts retaining the input shaft cover and pinion gear assembly.

15. Remove the snap ring retaining the input shaft assembly.



16. Remove the input shaft assembly. Inspect the pinion gear (C) for chipped, broken, or missing teeth. Inspect the input shaft bearing (D) for signs of wear. Replace the input shaft cover O-ring prior to reassembly.



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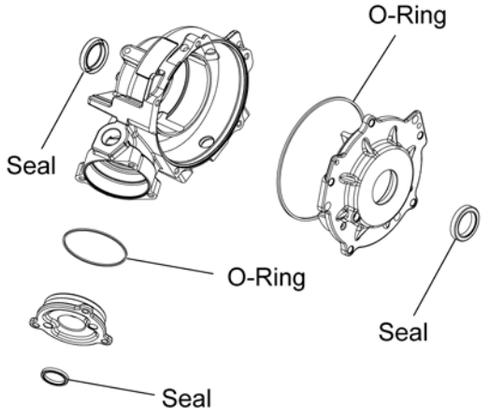
17. Inspect the input shaft bushing for wear.

18. Thoroughly clean the gearcase components before beginning reassembly.

Reassembly / Inspection

1. Replace all O-rings, seals, and worn components.



2. Press the pinion shaft seal into the pinion cover, until the seal is flush with the sealing surface.
3. Inspect bearings on output and pinion shafts. To replace, press new bearing onto shaft.

   NOTE: Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. While rotating bearings by hand, inspect for rough spots, discoloration, or corrosion. The bearings should turn smoothly and quietly, with no detectable up and down movement and minimal movement side to side.

4. Install input shaft, bearing, snap ring, and input cover with new o-ring. Torque bolts to specification.

= T
Input Cover Bolts: **7-11 ft-lbs**

5. Install the LH output hub (A) into the gearcase housing. The output hub should spin freely.

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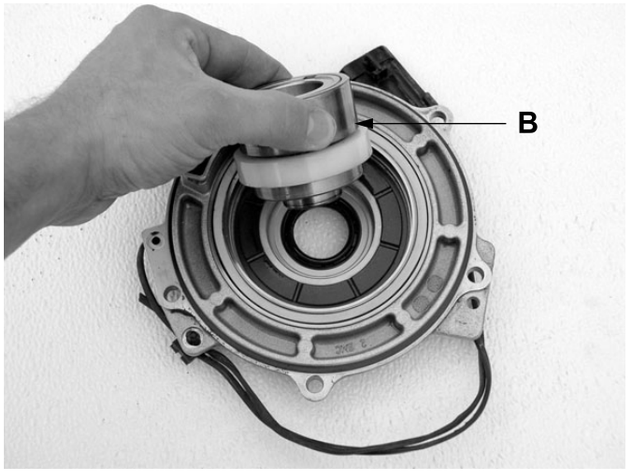
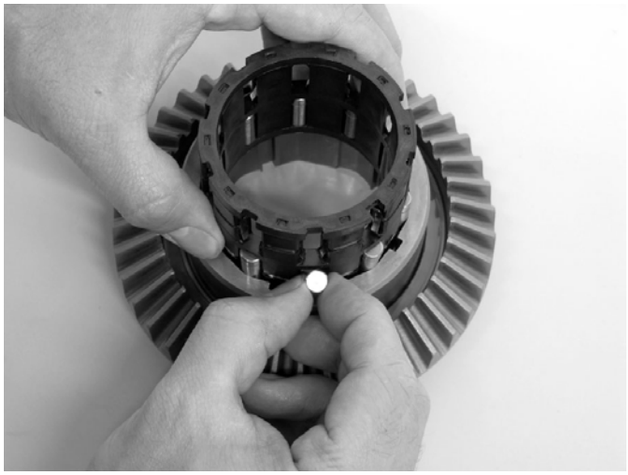
6. Install the RH output hub (B) into the output cover. The output hub should spin freely.

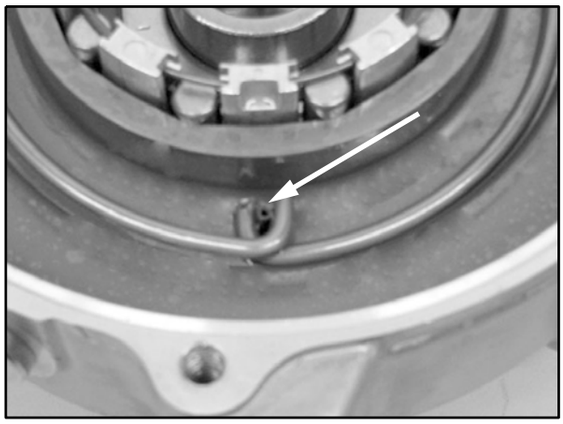


7. Install the rollers and roll cage into the ring gear. Insert the rollers as the roll cage is installed.

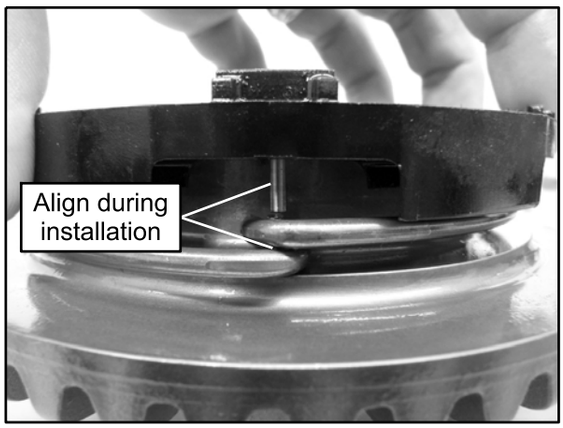


8. Install the ring gear and roll cage assembly into the gearcase housing.

9. Install the torsion spring by wrapping each leg of the spring around the dowel pin on the ring gear.



10. Align the spring retainer dowel pin with the ring gear dowel pin and install the retainer on top of the torsion spring.



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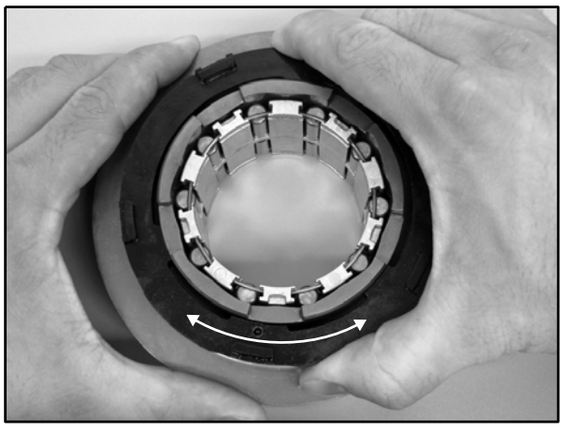
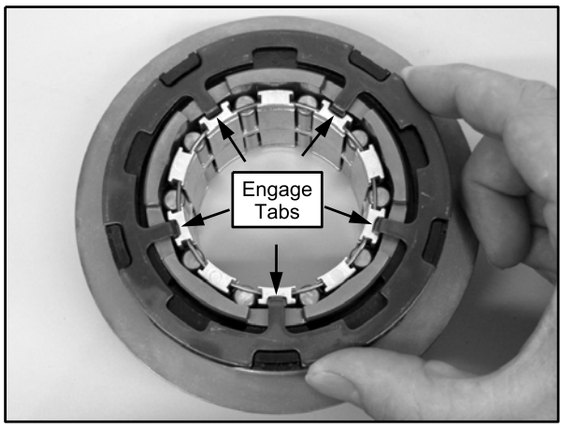
11. Check the action of the torsion spring by rotating in both directions to ensure the spring and retainer are installed properly.



12. Be sure the armature plate tabs are fully engaged into the roll cage assembly and are resting on the cut-grooves of the ring gear.

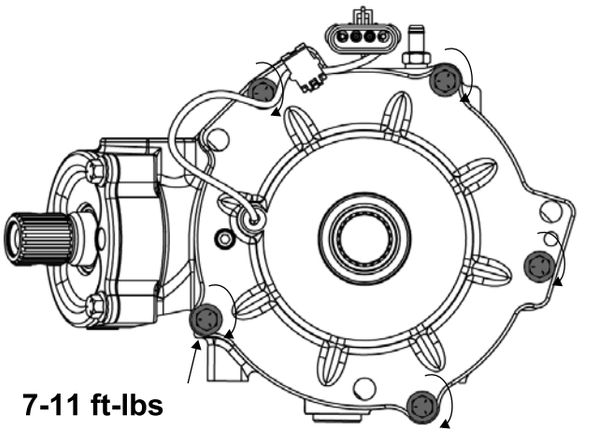


NOTE: Verify armature plate tabs are in the slots on the roll cage and are resting in the ring gear grooves.

13. Install the output hub and cover plate assembly with a new o-ring (arrow) onto the gearcase.

NOTE: Verify the square O-ring (arrow) is placed flat on the cover surface. If the O-ring is twisted, fluid leaks may occur.

14. Torque the cover plate bolts to specification.



7-11 ft-lbs

= T
Output Cover Bolts: **7-11 ft-lbs**

15. Lay the gearcase on the side with the output cover facing up.

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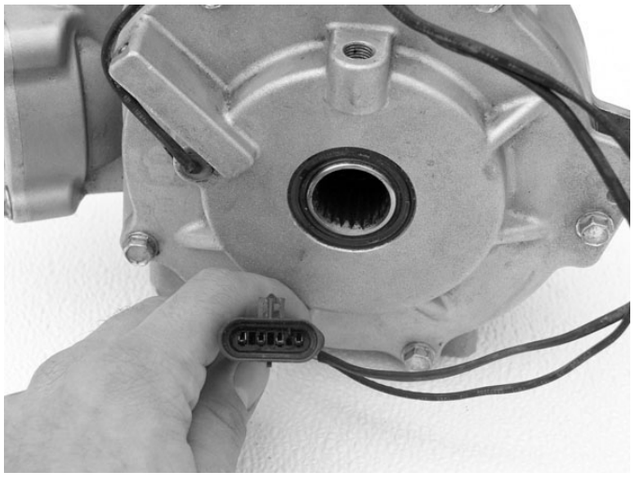
Troubleshooting, Front Gearcase (NON-ADC)

- Symptom: AWD Will Not Engage

1. Check the gearcase coil resistance. To test the gearcase coil resistance, use the coil harness (Grey & Brown/White).

   NOTE: To test the gearcase coil resistance, use the coil harness. The gearcase coil should measure between 22.8 ohms and 25.2 ohms.

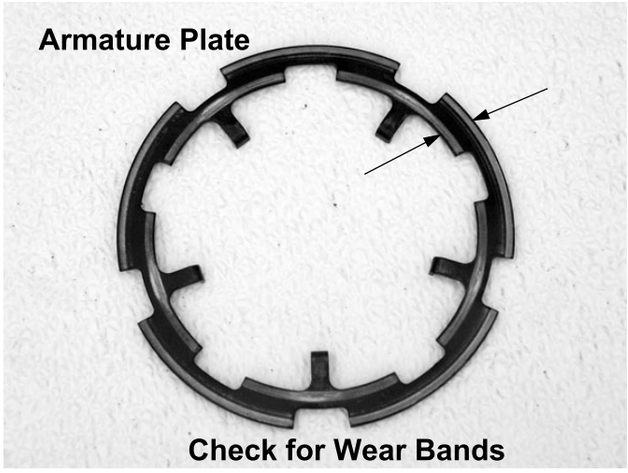


Front Gearcase Coil Resistance:
24 Ω ±10%

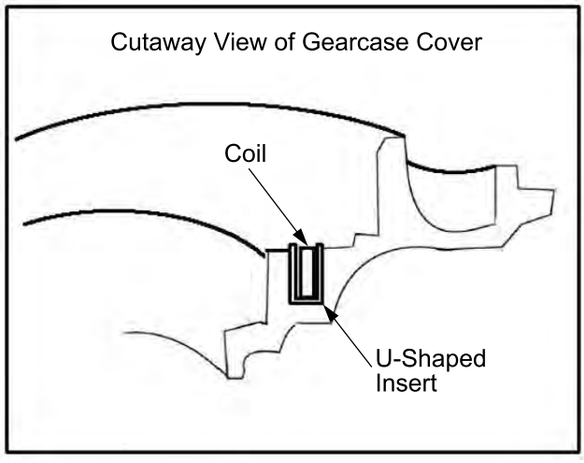
2. Check the minimum battery voltage at the Grey & Brown/White wires that feed the hub coil wires. There should be a minimum of *11.80-12.0 Volts* present for proper operation.

AWD Coil Applied Battery Voltage:
11.80-12.0 Vdc

3. Inspect the armature plate for a consistent wear pattern. There should be two distinct wear bands (one band inside the other). If only one band of wear is present (or if there is wear between the two bands, inspect the coil area as indicated in Step 4. A band with an interrupted wear mark may indicate a warped plate, which may cause intermittent operation.



4. Check to make sure the coil is seated in the U-shaped insert that is pressed into the gearcase cover. The top of the coil should be seated below the U-shaped insert. The U-shaped insert controls the pole gap. If the top of the coil is above the surface of the U-shaped insert it raises the armature plate, thereby increasing pole gap. If the pole gap increases the coil will not be strong enough to engage the AWD system. If this is the cause order a new Cover Plate Assembly.



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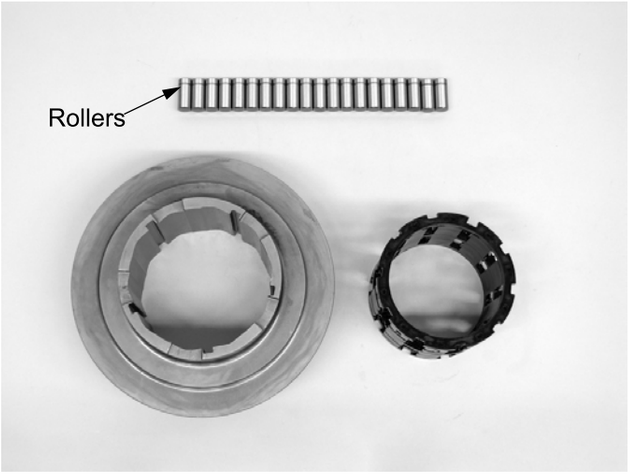
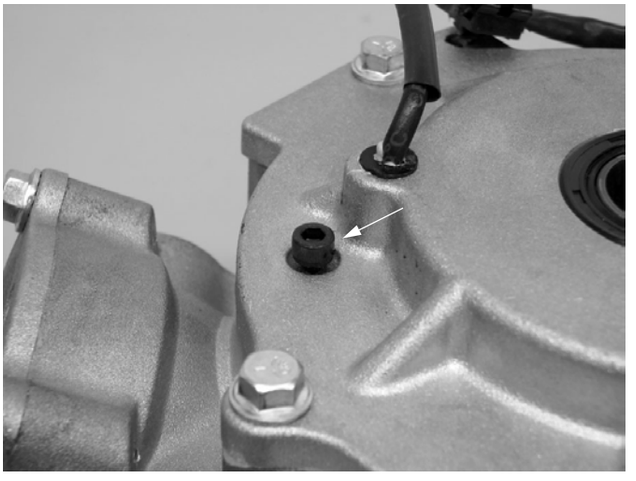
5. Inspect the rollers for nicks, scratches, and flat spots. Also inspect the roll cage for cracks and ensure the rollers are able to slide up and down and in and out freely within the roll cage sliding surfaces.



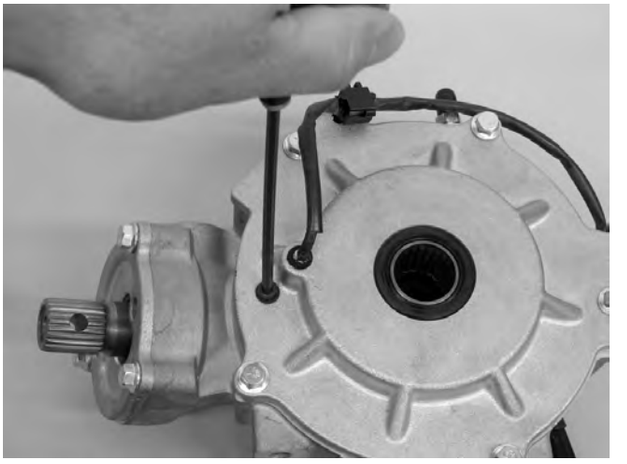
Setting Ring Gear Backlash NON ADC

NOTE: Ring gear backlash is set at the factory. No adjustment is required, unless the front cover is replaced or the back lash pad screw is removed.

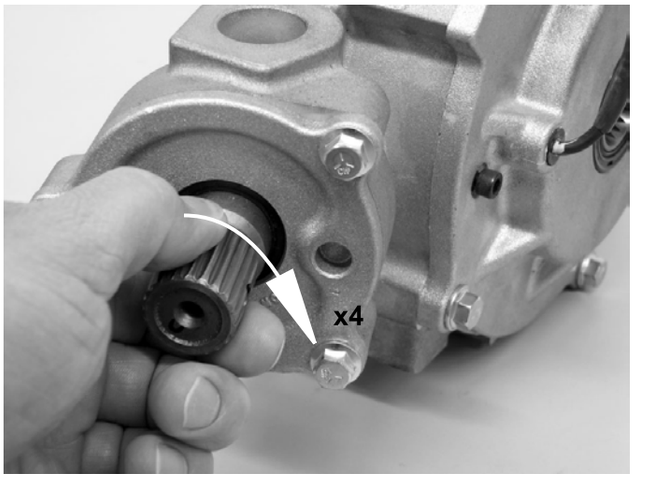
1. The backlash screw has locking agent that holds it into place. Use a heat gun to lightly heat up the locking agent on the screw.



2. Using a hex wrench, turn the back-lash screw out 3-4 turns. Re-apply Loctite® 262™ onto the bottom screw threads.



3. Turn the screw in until it is lightly seated, then turn the screw out 1/4 turn.
4. Set the gearcase upright. Rotate the input shaft at least 4 times. This ensures the ring gear completes one full rotation.



5. If a tight spot is felt during rotation, loosen the backlash screw another 1/8 turn. Perform step 4 again. Repeat this procedure until the pinion shaft rotates smoothly 4 times (1 revolution of ring gear).
6. The gearcase may be filled with the recommended amount of lubricant once gearlash procedure is complete.

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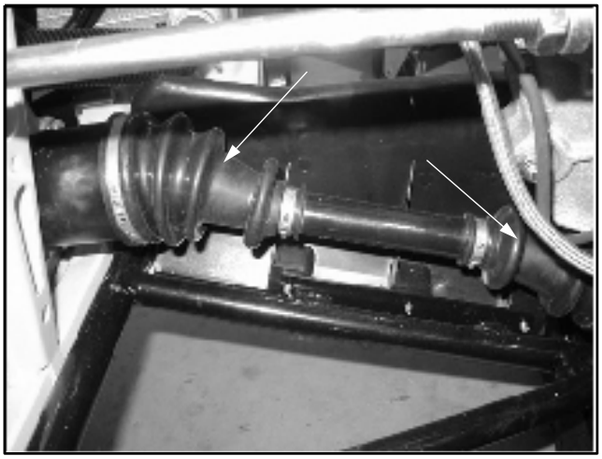
FRONT DRIVE (CV) SHAFT

Inspection

Check the front and rear drive shaft CV boots for any tears or leaking grease. If the drive shaft boot loses all grease, CV joint failure will occur.



Removal

1. Set the ATV in park. Remove hub dust cap (if equipped).
2. Remove cotter pin.
3. Loosen - but do not remove - the hub retaining nut.
4. Loosen - but do not remove - the wheel nuts.
5. Safely lift and support the front of the ATV.

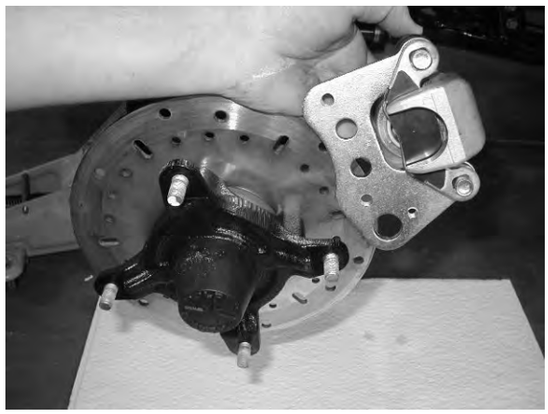
CAUTION

Serious injury could occur if machine tips or falls.

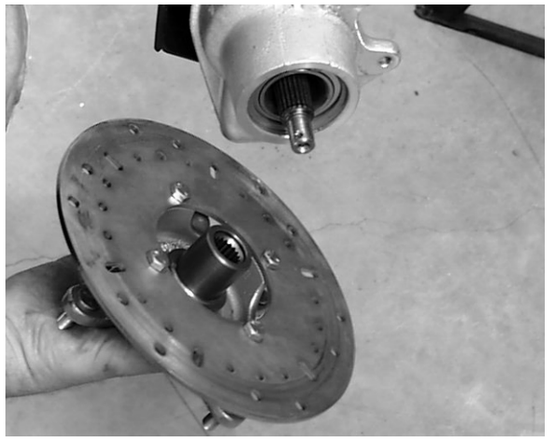
6. Remove wheel.
7. Remove the two brake caliper attaching bolts.

CAUTION

Do not hang the caliper by the brake line. Use wire to hang the caliper to prevent possible damage to the brake line.



8. Remove hub nut and hub assembly.



9. Remove cotter pin and nut from lower A-arm ball joint.

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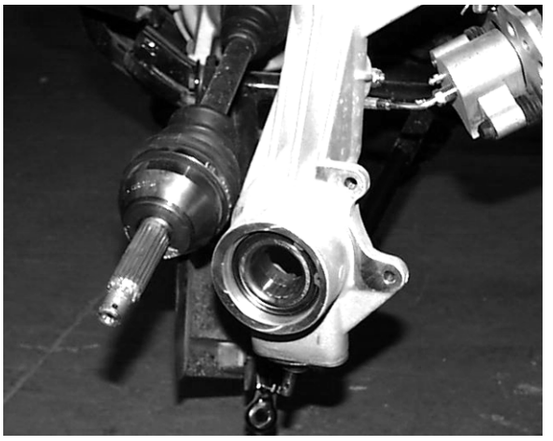
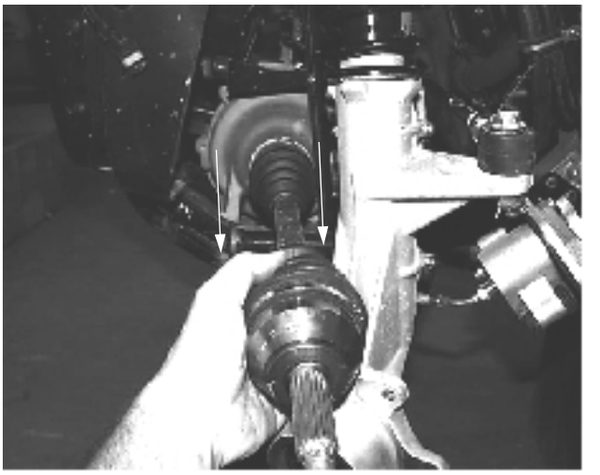
10. Remove lower A-arm from ball joint using a ball joint fork tool.

11. Pull strut assembly out while pivoting the CV drive shaft away until it clears the strut assembly.



12. Pull outward sharply on CV shaft assembly to remove it from the gearcase. In some instances, the splines may be corroded, making removal difficult. A slide hammer or other suitable device may be required for removal.



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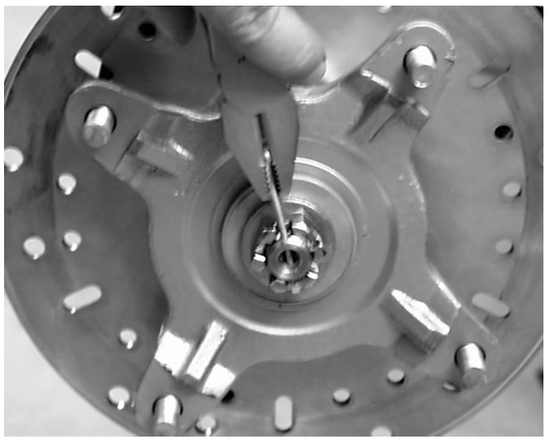
Installation

1. Install new compression ring on drive shaft. Apply an anti-seize compound to splines. Align splines of drive shaft with front gearcase and install by lightly tapping on drive shaft with soft-faced hammer.
2. Install drive shaft in strut.
3. Install lower ball joint, torque nut to specification and install new cotter pin.

= T
Ball Joint Retaining Nut: **30 ft-lbs (41 Nm)**

4. Install hub and tighten hub nut to specification.



= T
Front Hub Retaining Nut: **60 ft-lbs (91 Nm)**

5. Install brake caliper and tighten bolts to specification. Refer to Chapter 9.

= T
Brake Caliper Fastener: **18 ft-lbs (24 Nm)**

6. Install wheel and tight wheel nuts to specification. Refer to the beginning of this chapter.

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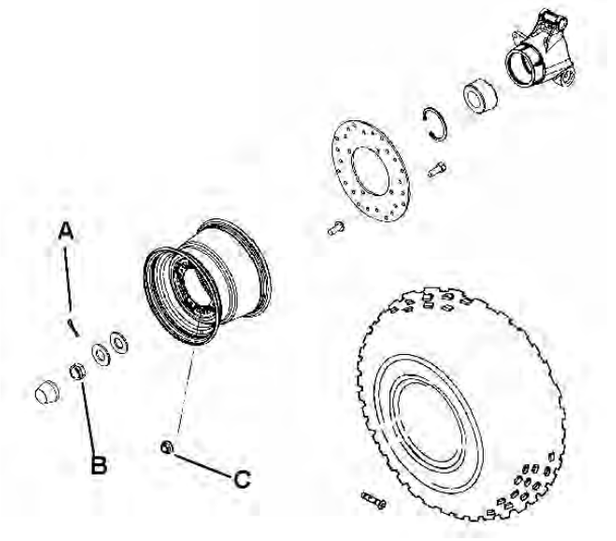
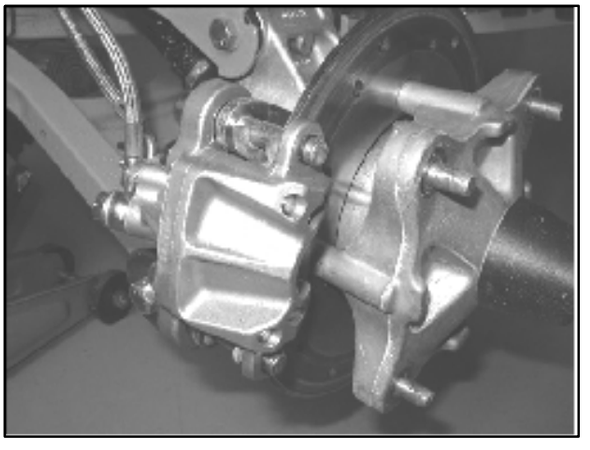
REAR HUB

Removal

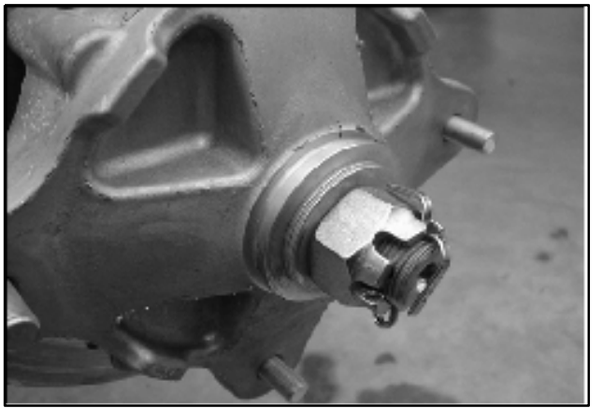
1. Place the ATV in Park and lock the parking brake. Remove rear hub cap.



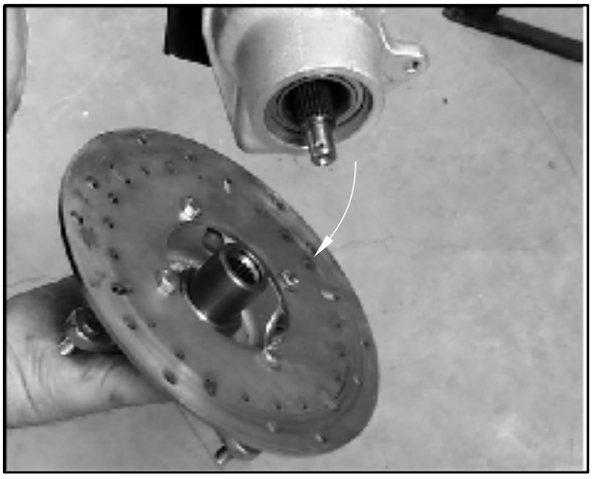
2. Remove cotter pin (A).
3. Loosen the hub retaining nut (B).
4. Loosen the wheel nuts (C).
5. Safely support the rear of the ATV.
6. Remove wheel nuts and wheel.
7. Remove the rear brake caliper and safely suspend the caliper from the frame with a piece of wire.



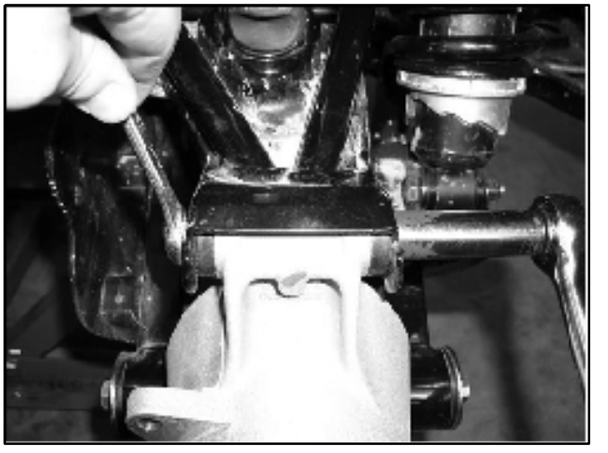
8. Remove hub nut, domed washer and flat washer.



9. Remove hub.



10. Remove upper control arm bolt as shown.



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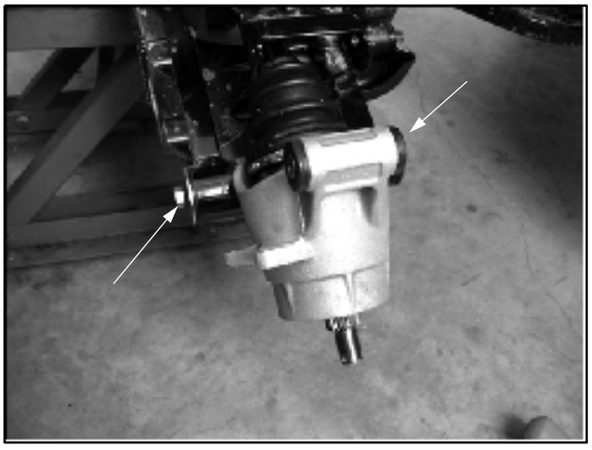
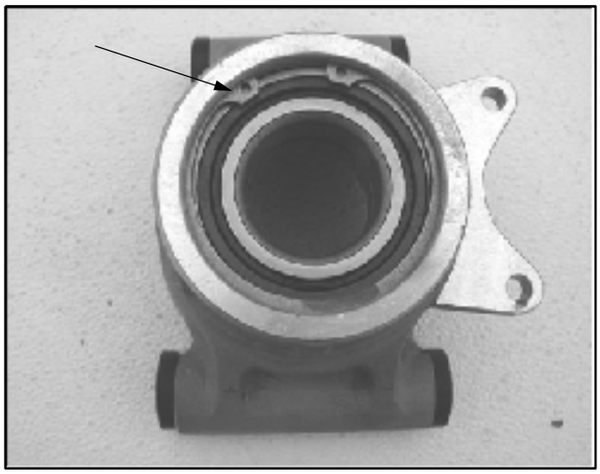
11. Remove both lower control arm bolts.



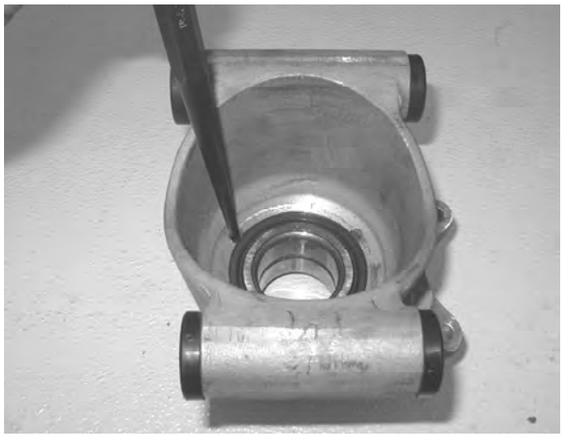
12. Remove bearing carrier.

Disassembly

1. Remove outer snap ring.



2. From the back side, tap on the outer bearing race with a drift punch in the reliefs as shown or press out using a hydraulic press.



NOTE: Drive bearing out evenly by tapping on outer race only. Once bearing is at bottom of casting, support casting on outer edges so bearing can be removed.

3. Inspect bearing.

NOTE: Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. While rotating bearings by hand, inspect for rough spots, discoloration, or corrosion. The bearings should turn smoothly and quietly, with no detectable up and down movement and minimal movement sideways between inner and outer race.

4. Inspect bearing housing for wear or damage. Replace housing if damaged.

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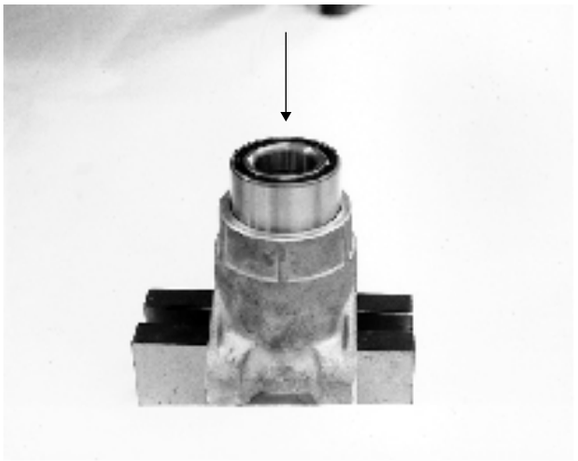
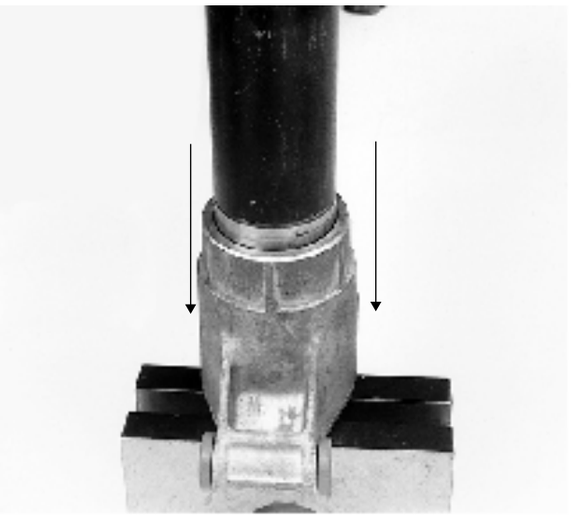
Assembly

1. Support bottom of bearing carrier housing.

2. Start bearing in housing.



3. Press bearing into place until outer race bottoms on housing.



CAUTION

Use an arbor press only on the outer race to avoid bearing damage.

4. Install snap ring into groove.

Installation

1. Insert bearing carrier on drive shaft.
2. Align bottom of carrier housing and lower control arm. Grease and slide lower control arm bushings into place, securing corner housing.

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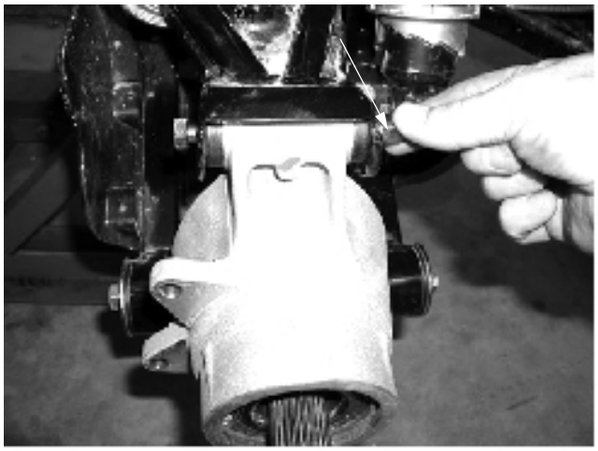
3. Install and torque both lower control arm bolts.



= T
Lower Control Arm Bolt: **37 ft-lbs (50 Nm)**

4. Lift bearing carrier until top aligns with upper control arm. Install and torque upper control arm bolt and torque to specification.

= T
Upper Control Arm Bolt: **37 ft-lbs (50 Nm)**

5. Pull drive shaft outward and install hub onto driveshaft splines. Apply anti-seize to the splines.
6. Install cone washers with domed side facing outward.
7. Install retainer nut, wheel and wheel nuts.
8. Remove jack stand and torque axle nut and wheel nuts to specification.

= T
Wheel Nut: Steel Wheels: **27 ft-lbs (37 Nm)** Aluminum Wheels: **30 ft-lbs + 1/4 turn** **(41 Nm + 1/4 turn)**

= T
Rear Hub Nut: **80 ft-lbs (109 Nm)**

9. Install a new cotter pin. Tighten nut slightly to align holes if required.

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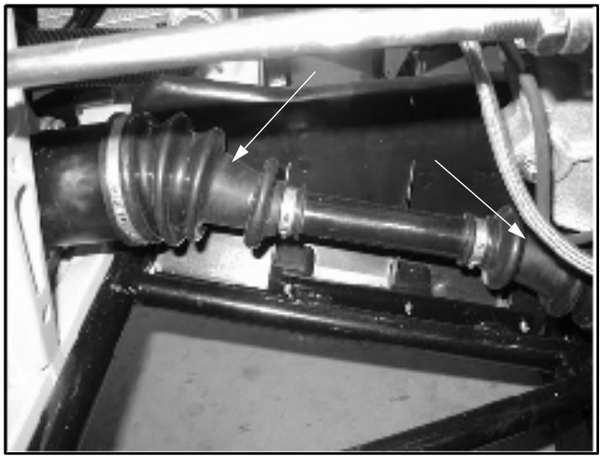
REAR DRIVE (CV) SHAFT

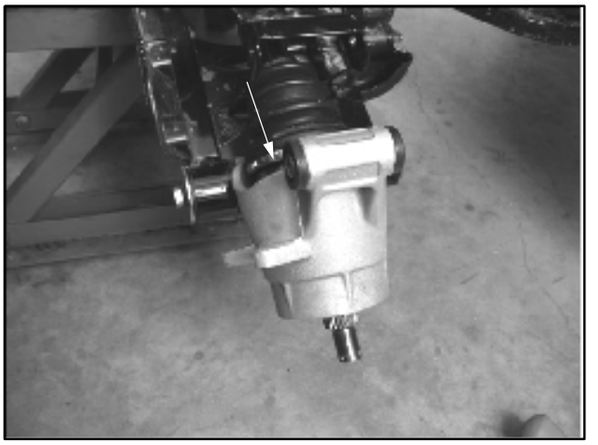
Inspection

Check the front and rear driveshaft CV boots for any tears or leaking grease. If the driveshaft boot loses all grease, CV joint failure will occur.

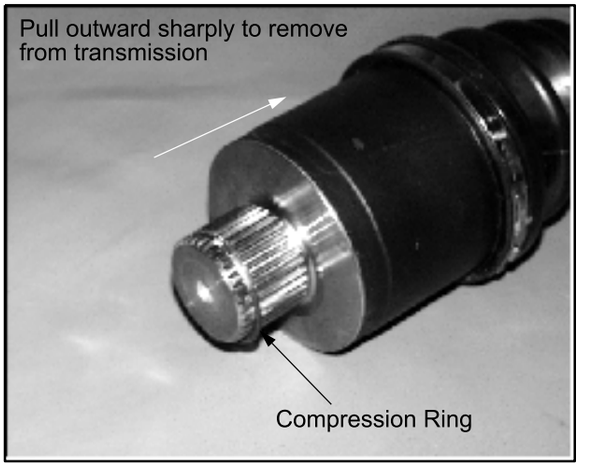


Removal

1. Remove rear hub. Refer to “REAR HUB REMOVAL” in this chapter.
2. Remove upper carrier bolt. Tip hub outward and remove shaft from carrier.



3. Pull sharply outward to remove shaft from transmission. Install a new compression ring and apply an anti-sieze compound to the splines upon assembly.



Installation

1. Apply anti-seize compound to splines of shaft.
2. Install a new lock ring and install the inner shaft.
3. Slide shaft assembly into the bearing carrier hub.

4. Lift bearing carrier into place and install bolt to upper control arm. Torque bolt to specification.

= T
Upper Hub Carrier Bolt: **37 ft-lbs (50 Nm)**

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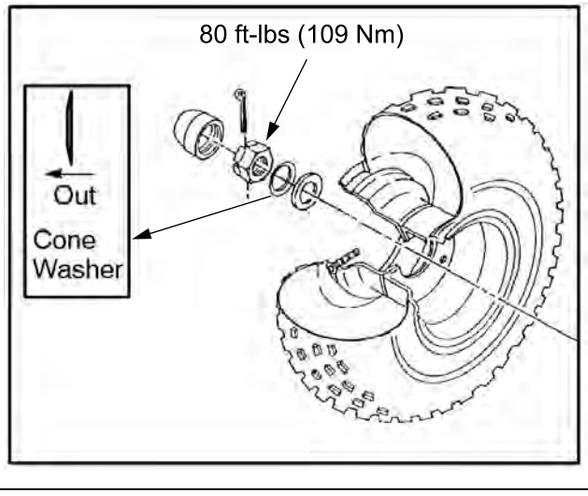
5. Install hub, flat washer, domed washer (domed side out) and nut. Torque center hub nut to specification. Install new cotter pin and hub cap.

= T
Rear Hub Nut: **80 ft-lbs (109 Nm)**

6. Install brake caliper and tighten bolts to specification. Refer to Chapter 9.
7. Install rear wheel and torque wheel nuts to specification.



= T
Wheel Nut: Steel Wheels: **27 ft-lbs (37 Nm)** Aluminum Wheels **30 ft-lbs + 1/4 turn** **(41 Nm + 1/4 turn)**

8. Grease all fittings thoroughly with Premium U-Joint Lubricant (**PN 2871551**).

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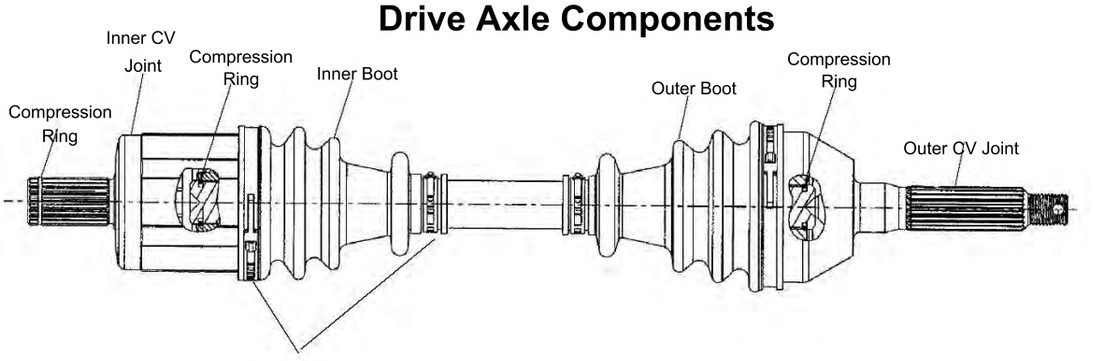
CV DRIVE SHAFT SERVICE

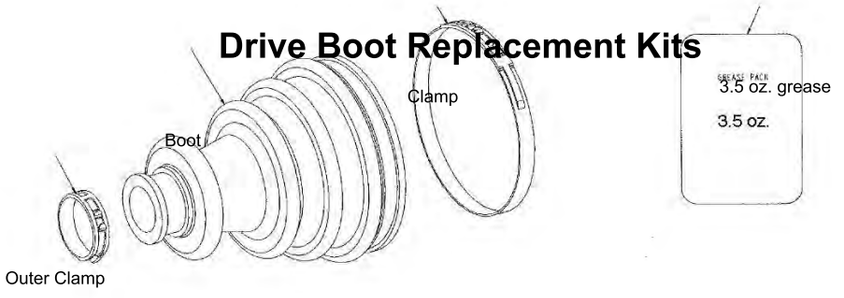
Drive Shafts and Propshafts Components

NOTE: Refer to your parts manual for the proper replacement parts.

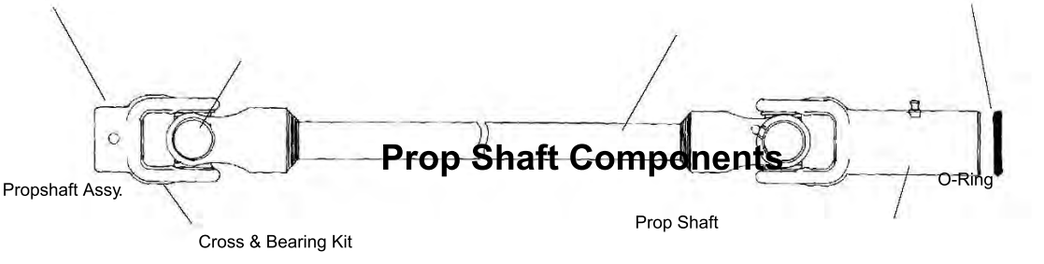
Drive Axle Components



Drive Boot Replacement Kits



Prop Shaft Components



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Drive Shaft and CV Joint Handling Tips

Care should be exercised during driveshaft removal or when servicing CV joints. Driveshaft components are precision parts.

Cleanliness and following these instructions is very important to ensure proper shaft function and a normal service life.

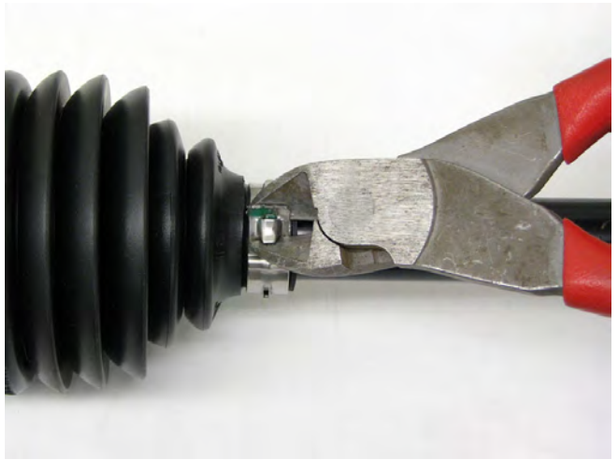
- The complete driveshaft and joint should be handled by holding only the interconnecting shaft to avoid disassembly or potential damage to the driveshaft joints.
- Over-angling of joints beyond their capacity could result in boot or joint damage.
- Make sure surface-ground areas and splines of shaft are protected during handling to avoid damage.
- Do not allow boots to come into contact with sharp edges or hot engine and exhaust components.
- The CV interconnecting shaft should never be used as a lever arm to position other suspension components.
- Never use a hammer or sharp tools to remove or to install boot clamps.
- Be sure joints are thoroughly clean and that the proper amount and type of grease is used to refill when joint boots are replaced and when joints are cleaned. Refer to text for grease capacity of CV joints and CV joint boots.

  NOTE: When replacing a damaged boot, check the grease for contamination by rubbing it between two fingers. A gritty feeling indicates contamination. If the grease is not contaminated, the boot can be replaced without cleaning the CV joint. Use the recommended amount of grease for boot replacement only (see illustration).

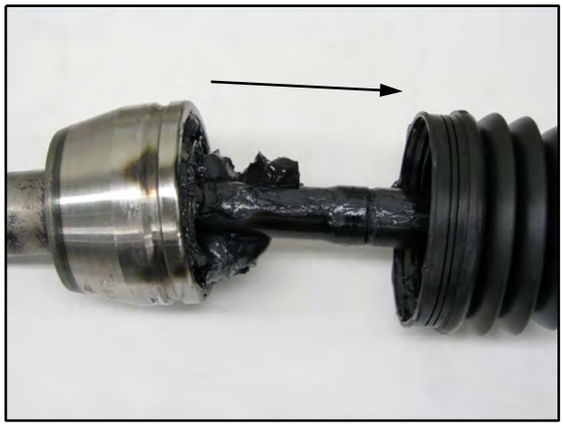
  Use only the Constant Velocity Joint grease supplied with boot service kit. IF CV JOINT WAS CLEANED, add the recommended amount of grease to the joint in addition to the grease pack supplied with boot kit.

Outer CV Joint / Boot Replacement

1. Using a side cutters, cut away and discard the boot clamps.



2. Remove the large end of the boot from the CV joint and slide the boot down the shaft.



3. Clean the grease from the face of the joint.
4. Place the drive shaft in a soft-jawed vise.

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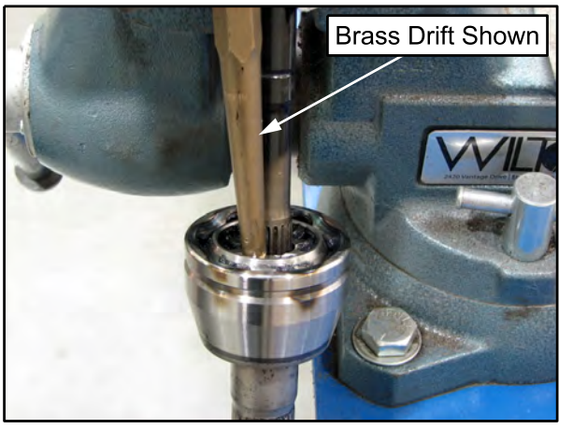
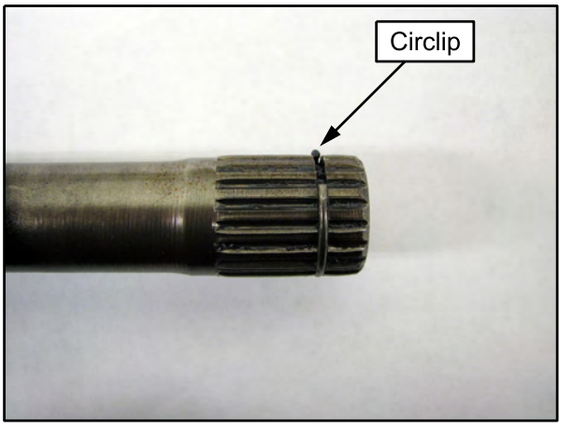
5. Using a soft-faced hammer, or brass drift, strike the inner race of the joint to drive the joint off the drive shaft. Be sure to tap evenly around the joint to avoid binding.



NOTE: Tap on inner race only!

6. Make sure the circlip is on the shaft and not left in the joint.



7. Remove the CV boot from the shaft.

CAUTION

Complete disassembly of the CV joint is NOT recommended. The internal components are a precision fit and develop their own characteristic wear patterns. Intermixing the internal components could result in looseness, binding, and/or premature failure of the joint.

NOTE: If the grease in the joint is obviously contaminated with water and/or dirt, the joint should be replaced.

8. Thoroughly clean the joint with an appropriate solvent and dry the joint to prevent any residual solvent from being left in the joint upon reassembly.
9. Visually inspect the joint by tilting the inner race to one side to expose each ball. Severe pitting, galling, play between the ball and its cage window, any cracking or damage to the cage, pitting or galling or chips in raceways call for joint replacement.

   NOTE: Shiny areas in ball tracks and on the cage spheres are normal. Do not replace CV joints because parts have polished surfaces. Replace CV joint only if components are cracked, broken, worn or otherwise unserviceable.

10. Clean the splines on the end of the shaft and apply a light coat of grease prior to reassembly.
11. Slide the small boot clamp and boot (small end first) onto the drive shaft and position the boot in it's groove machined in the shaft.
12. Install a NEW circlip on the end of the shaft.

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13. Grease the joint with the special CV joint grease provided in the boot replacement kit. Fill the cavity behind the balls and the splined hole in the joint's inner race. Pack the ball tracks and outer face flush with grease. Place any remaining grease into the boot.

CAUTION

The grease provided in the replacement kit is specially formulated for wear resistance and durability. DO NOT use substitutes or mix with other lubricants.

NOTE: The amount of grease that's provided is pre-measured, so use all the grease.

Boot Replacement Grease Requirements:

Grease Only Service Kits
PN 1350059 - 20g /
PN 1350046 - 30g /
PN 1350047 - 50g

Outer CV Joint Capacity:
Front - 42.5g / Rear - 85g

14. Slide the joint onto the drive shaft splines and align the circlip with the lead-in chamfer on the inner race of the joint.

15. Use a soft-faced hammer to tap the joint onto the drive shaft until it locks into place.
16. Pull on the joint to make sure it is securely locked in place.
17. Remove excess grease from the CV joint's external surfaces and place the excess grease in the boot.
18. Pull the boot over the joint and position the boot lips into the grooves on the joint housing and shaft. Make sure the boot is not dimpled or collapsed.
19. Install and tighten the large clamp using the Axle Boot Clamp Tool (8700226 or PU-48951).

Axle Boot Clamp Tool
8700226 or PU-48951

20. While pulling out on the CV shaft, fully extend the CV joint and slide a straight O-ring pick or a small slotted screw driver between the small end of the boot and the shaft. This will allow the air pressure to equalize in the CV boot in the position that the joint will spend most of its life. Before you remove your instrument, be sure the small end of the boot is in its correct location on the shaft.
21. Install and tighten the small clamp on the boot using the Axle Boot Clamp Tool (8700226 or PU-48951).

Axle Boot Clamp Tool
8700226 or PU-48951

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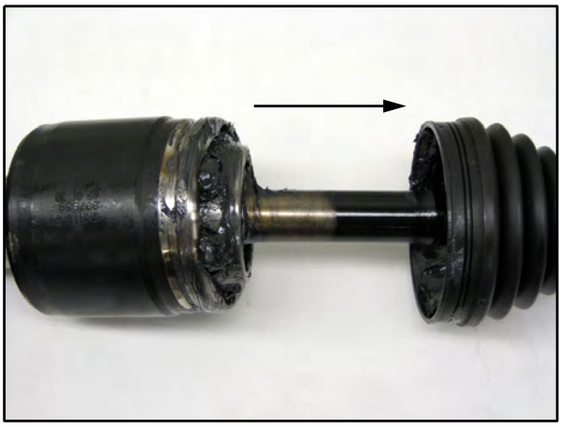
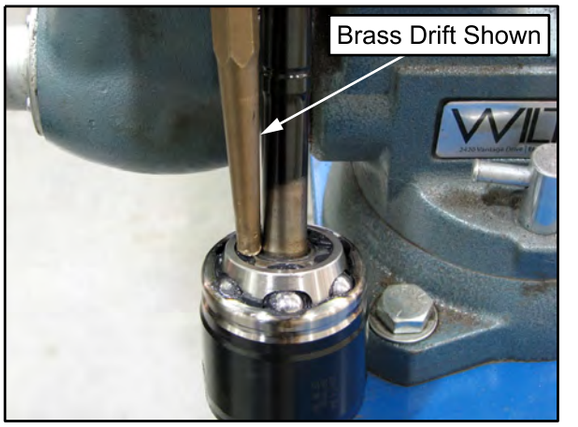
Inner Plunging Joint / Boot Replacement

1. Using a side cutters, cut away and discard the boot clamps.

2. Remove the large end of the boot from the plunging joint and slide the boot down the shaft.

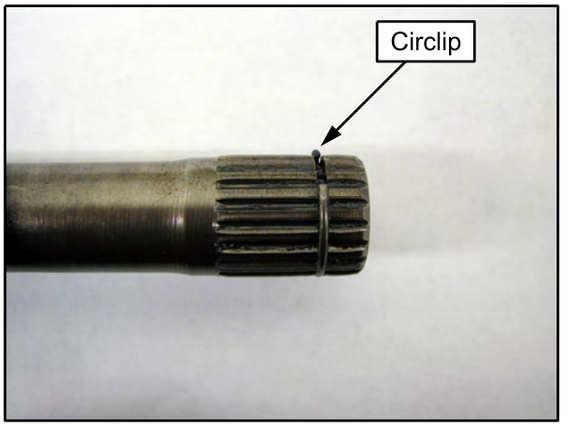


3. Clean the grease from the face of the joint.
4. Place the drive shaft in a soft-jawed vise.
5. Using a soft-faced hammer, or brass drift, strike the inner race of the joint to drive the joint off the drive shaft. Be sure to tap evenly around the joint to avoid binding.



NOTE: Tap on inner race only!

6. Make sure the circlip is still on the shaft and not left in the joint.



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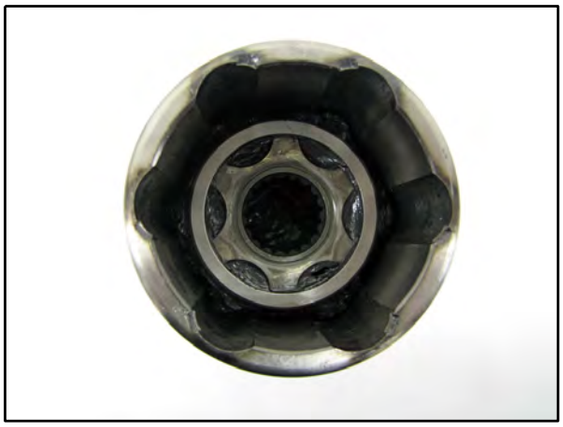
7. Remove the boot from the shaft.

CAUTION

Complete disassembly of the plunging joint is NOT recommended. The internal components are a precision fit and develop their own characteristic wear patterns. Intermixing the internal components could result in looseness, binding, and/or premature failure of the joint.

NOTE: If the grease in the joint is obviously contaminated with water and/or dirt, the joint should be replaced.



8. Thoroughly clean the joint with an appropriate solvent and dry the joint to prevent any residual solvent from being left in the joint upon reassembly.
9. Visually inspect the joint for damage. Replace if needed.
10. Clean the splines on the end of the shaft and apply a light coat of grease prior to reassembly.
11. Slide the small boot clamp and boot (small end first) onto the drive shaft and position the boot in its groove machined in the shaft.
12. Install a NEW circlip on the end of the shaft.
13. Grease the joint with the special CV joint grease provided in the boot replacement kit. Fill the cavity behind the balls and the splined hole in the joint's inner race. Pack the ball tracks and outer face flush with grease. Place any remaining grease into the boot.

CAUTION

The grease provided in the replacement kit is specially formulated for wear resistance and durability. DO NOT use substitutes
or mix with other lubricants.

NOTE: The amount of grease that's provided is pre-measured, so use all the grease.

Boot Replacement Grease Requirements:

Grease Only Service Kits
PN 1350059 - 20g /
PN 1350046 - 30g/
PN 1350047 - 50g

Joint Total Capacity (Joint and Boot):
Outer - 42.5g / Inner - 85g

14. Fully compress the joint and push the drive shaft firmly into the inner race.
15. Align the circlip with the lead-in chamfer.

16. Use a soft-faced hammer to tap the joint onto the drive shaft until you reach the end of the splines and the joint locks in place.
17. Pull on the joint to test that the circlip is seated and that the joint is securely fastened to the shaft.

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18. Remove excess grease from the plunging joint's external surfaces and place the excess grease in the boot.
19. Pull the boot over the joint and position the boot lips into the grooves on the joint housing and shaft. Make sure the boot is not dimpled or collapsed.
20. Install and tighten the small clamp using the Axle Boot Clamp Tool (8700226 or PU-48951).

Axle Boot Clamp Tool:
8700226 or PU-48951

21. Pull out on the drive shaft to center the joint in the housing. Slide a straight O-ring pick or a small slotted screw driver between the large end of the boot and the joint housing and lift up to equalize the air pressure in the boot.
22. Position the boot lip in its groove. Install and tighten the large clamp using the Axle Boot Clamp Tool.

Axle Boot Clamp Tool:
8700226 or PU-48951

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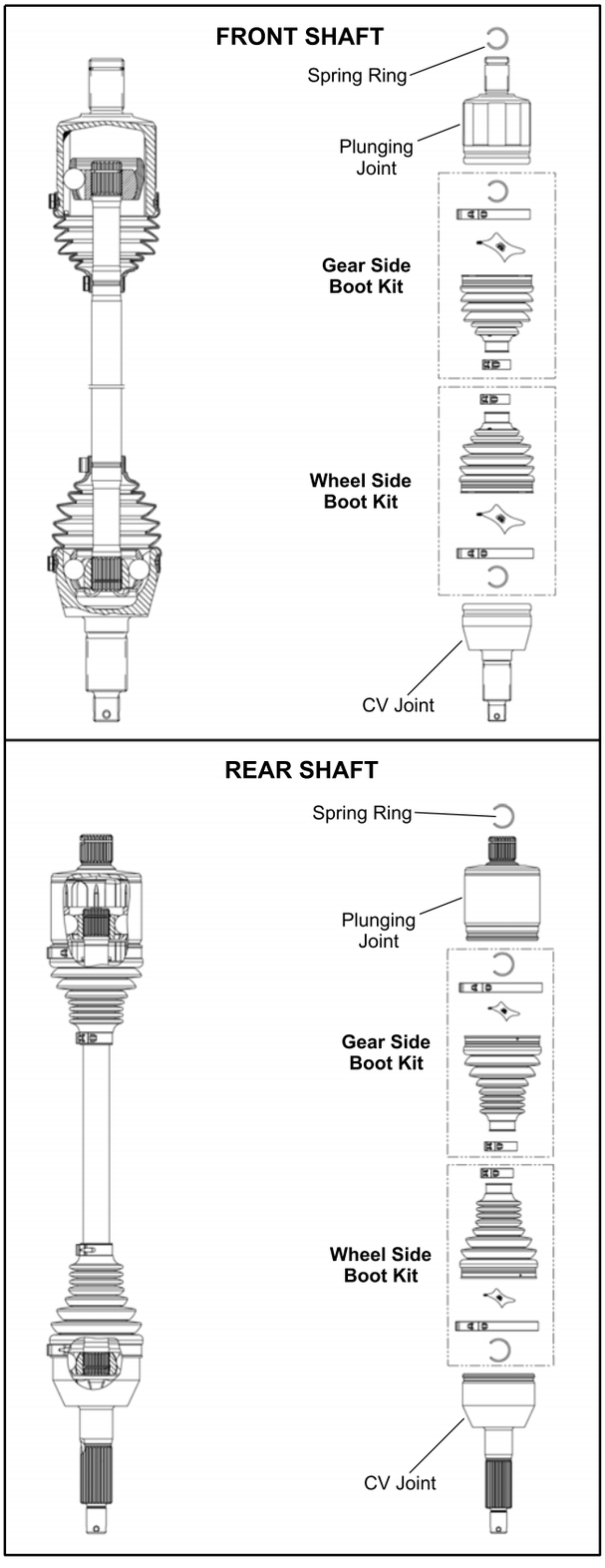
Drive Shaft Exploded Views



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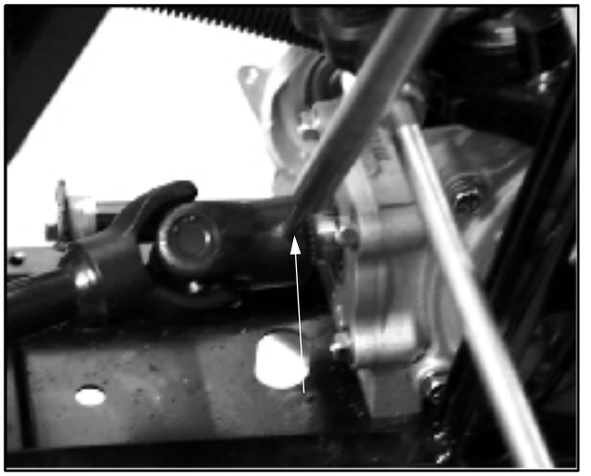
PROP SHAFT - FRONT OR REAR

Removal and Installation

1. Using Roll Pin Removal Tool (PN 2872608), remove the roll pin from prop shaft at rear of housing (front only) or transmission output shaft (rear only). Slide prop shaft back and away from housing, then pull sharply forward to remove from transmission shaft.
2. For installation, reverse the removal procedure.



NOTE: If removing rear propshaft, loosening and/or removal of rear gearcase mounting bolts may be required to gain necessary clearance for propshaft removal.

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U-JOINT SERVICE

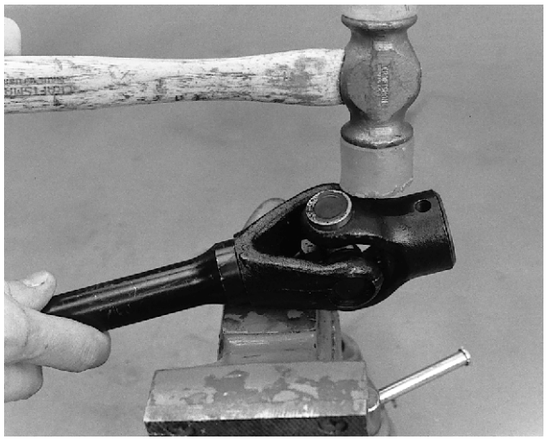
Disassembly

CAUTION
Always wear eye protection when working with spring-tensioned components

1. Remove internal or external snap ring from all bearing caps.

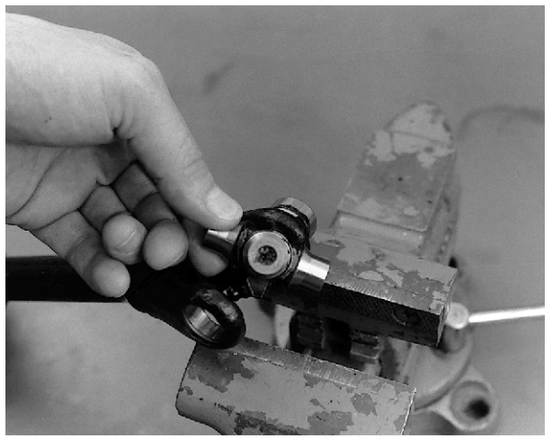
NOTE: If yoke or bearing is removed, cross bearing must be replaced. Note orientation of grease fitting (if equipped) and mark inner and outer yoke for correct re-positioning during installation.

2. Support inner yoke as shown and drive outer yoke down (bearing cap out) with a soft face hammer.



3. Support U-joint in vise as shown and drive inner yoke down to remove remaining bearing ca

4. Force U-joint cross to one side and lift out of inner yoke.



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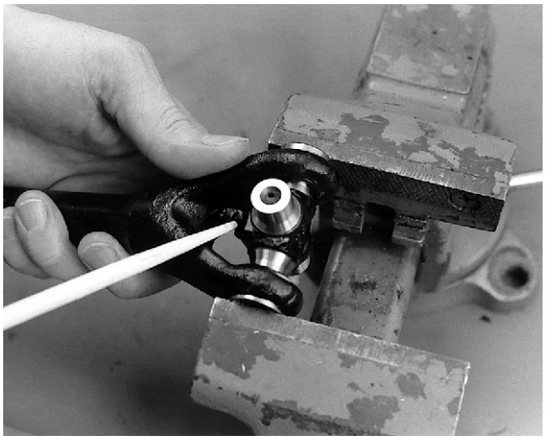
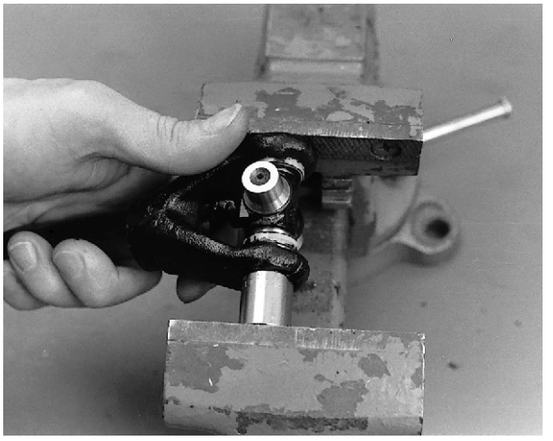
Assembly

1. Install new bearing caps in yoke by hand. Carefully install U-joint cross with grease fitting properly positioned inward toward center of shaft. Take care not to dislodge needle bearings upon installation of cross joint. Tighten vise to force bearing caps in.

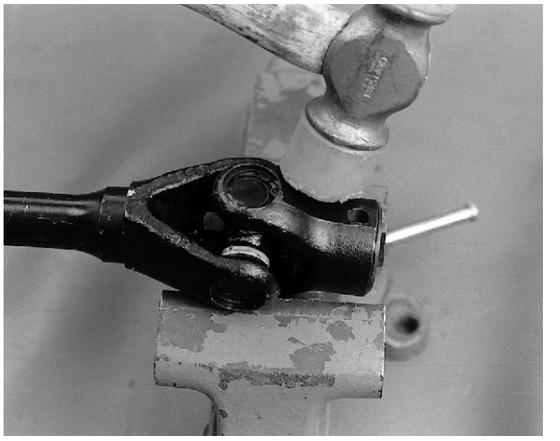


2. Using a suitable arbor, fully seat bearing cap in one side. Continually check for free movement of bearing cross as bearing caps using a suitable arbor, fully seat bearing cap in one side. Continually check for free movement of bearing cross as bearing caps are assembled. are assembled.



3. Install snap ring to contain bearing cap just installed. Repeat procedure for other side.
4. Install snap ring to contain bearing cap just installed. Repeat procedure for other side.

5. Install snap ring to contain bearing cap just installed. Repeat procedure for other side.
6. Seat all bearing caps against snap rings by supporting cross shaft and tapping on each corner as shown.



7. When installation is complete, yokes must pivot freely in all directions without binding. If the joint is stiff or binding, tap the yoke lightly to center the joint until it pivots freely in all directions.

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CHAPTER 8
TRANSMISSION

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TRANSMISSION - GENERAL

Torque Specifications

COMPONENT	FT-LBS (IN-LBS)	NM
Transmission Case Bolts	25-30	36-43
Bell Crank Nut	12-18	17-26
Transmission Fill/Drain Plug	20-25	29-36
Trans. Mounting Bolts	37-40	50-57
Gear Sector Cover	8-12	11-17
Oil Deflector Screws	(20-30)	2-3.6
Snorkel Torx Screw	8-12	11-17
Bearing Cover	8-12	11-17
Carrier Cover	23-27	33-39
Shift Fort Retainer Screws	8-12	11-17
Park Plate	8-12	11-17

Special Tools

PART NUMBER	TOOL DESCRIPTION
2871695 (Part of 2871702 Kit)	Backlash Setting Tool
2871698 (Part of 2871702 Kit)	Rear Output Seal Driver
2871699 (Part of 2871702 Kit)	Rear Driveshaft Seal Guide
2871282	Bearing Seal Driver (50 mm)

Bosch Automotive Service Solutions: 1-800-328-6657 or http://polaris.service-solutions.com

Lubrication

Refer to Chapter 2 for transmission lubricant type and capacity.

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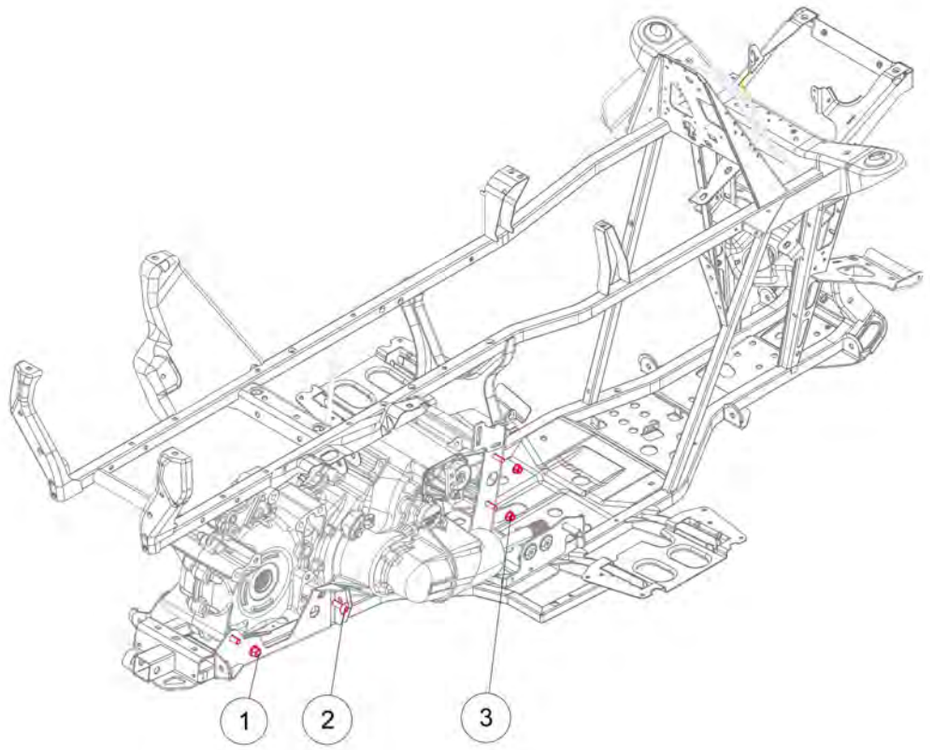
Transmission Frame Mounts



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1 - Frame Long Bolt: **37 ± 10 ft-lbs (50 ± 13 Nm)** 2 - Side Fasteners: **37 ± 10 ft-lbs (50 ± 13 Nm)** 3 - Frame Long Bolt: **20 ± 10 ft-lbs (27 ± 13 Nm)**

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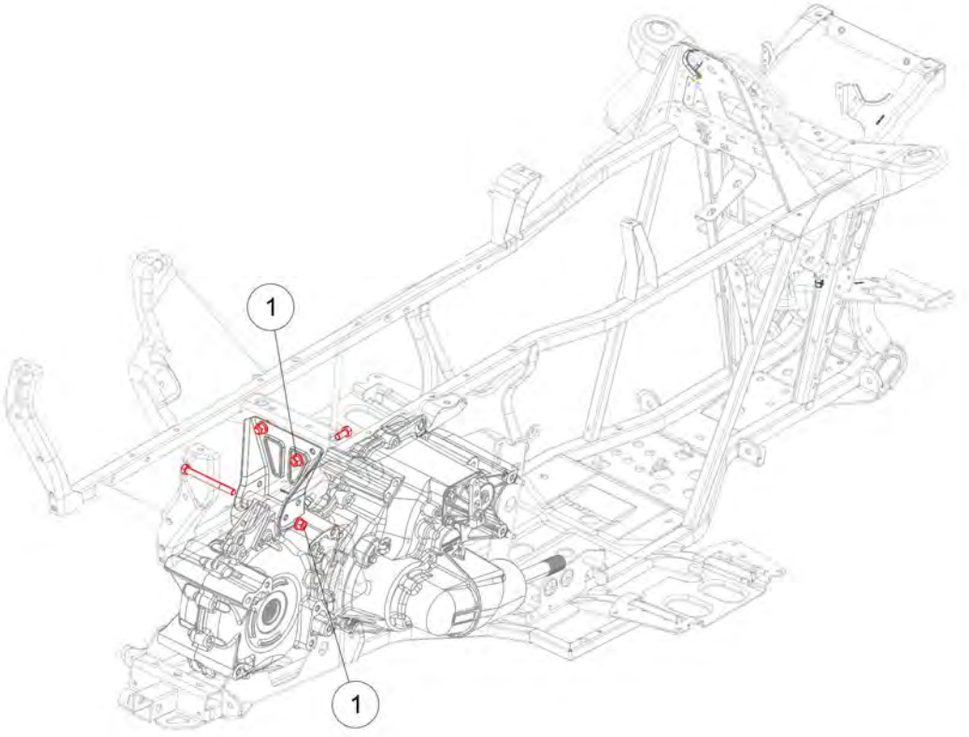
Transmission Upper Frame Mount



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1 - Upper Bracket-to-Frame Fasteners: **37 ± 10 ft-lbs (50 ± 13 Nm)** 1 - Bracket-to-Transmission Bolt: **37 ± 10 ft-lbs (50 ± 13 Nm)**

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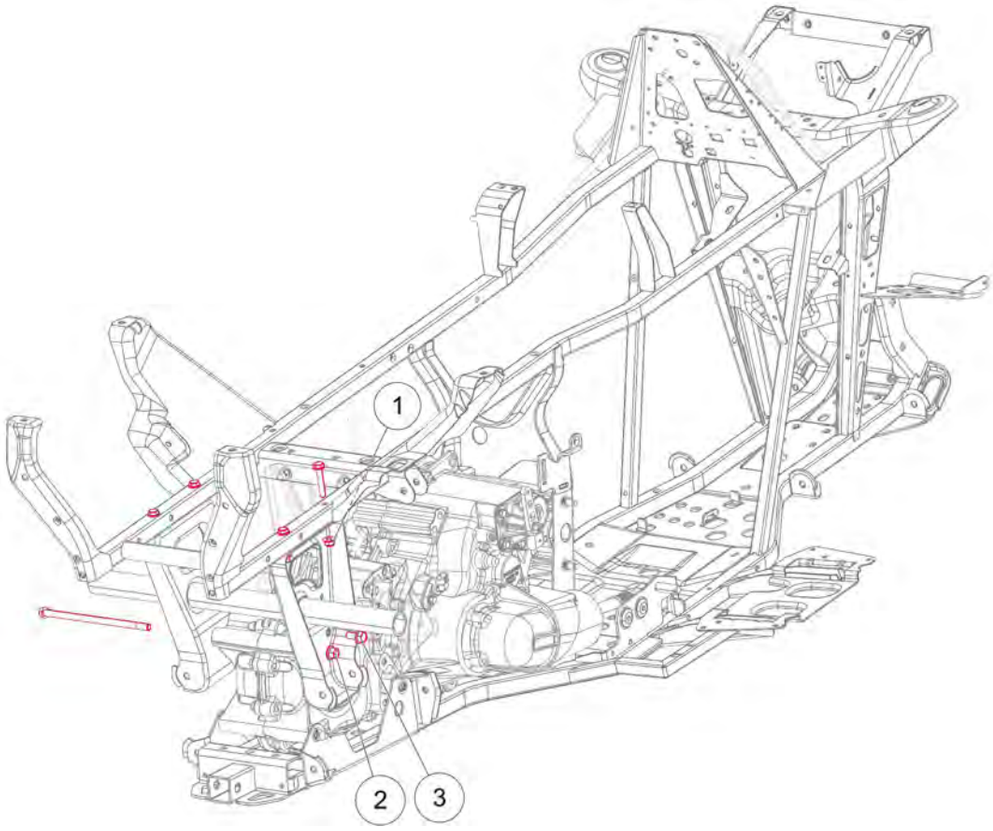
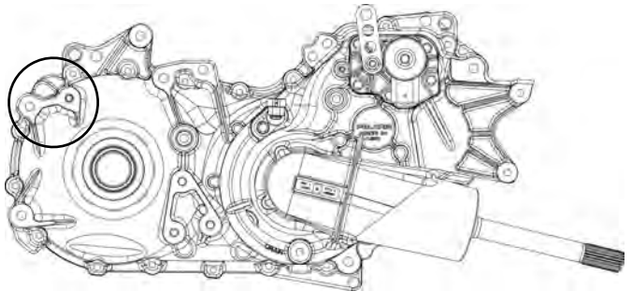
Transmission Rear Stabilizer Mounts





= T
1 - Stabilizer-to-Frame Fasteners: **20 ft-lbs (27 Nm)** 2 - Stabilizer-to-Transmission Bolt: **37 ft-lbs (50 Nm)** 3 - Stabilizer-to-Transmission Fasteners: **37 ft-lbs (50 Nm)**

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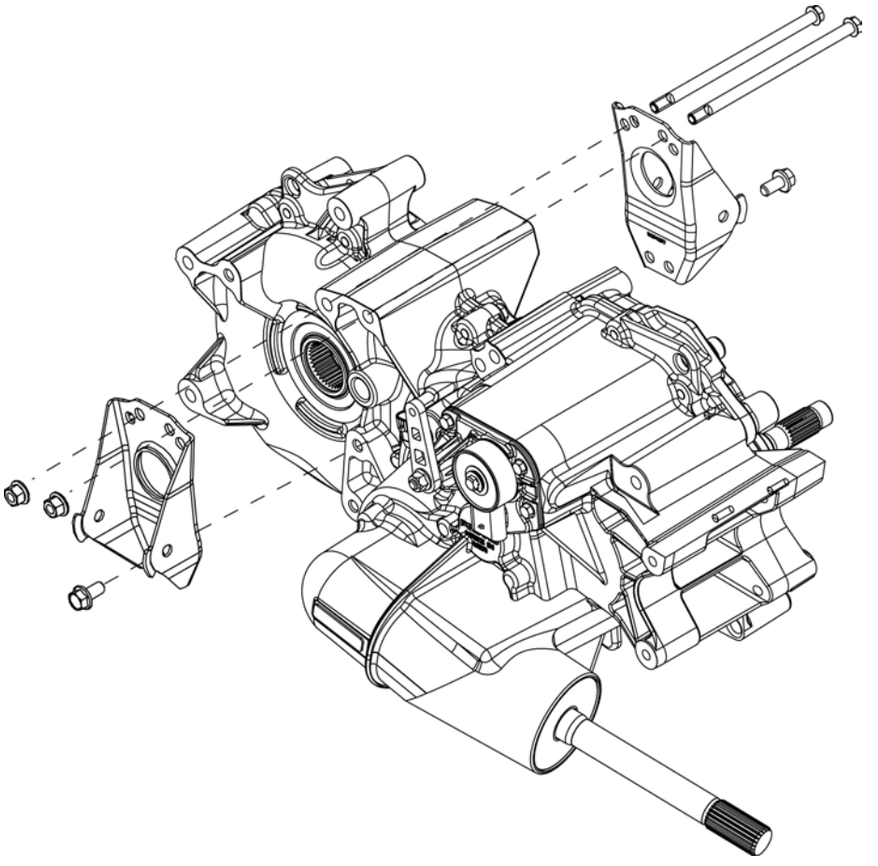
Transmission Control Arm Bracket Mounts



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Bracket Fasteners: **37 ft-lbs (50 Nm)**

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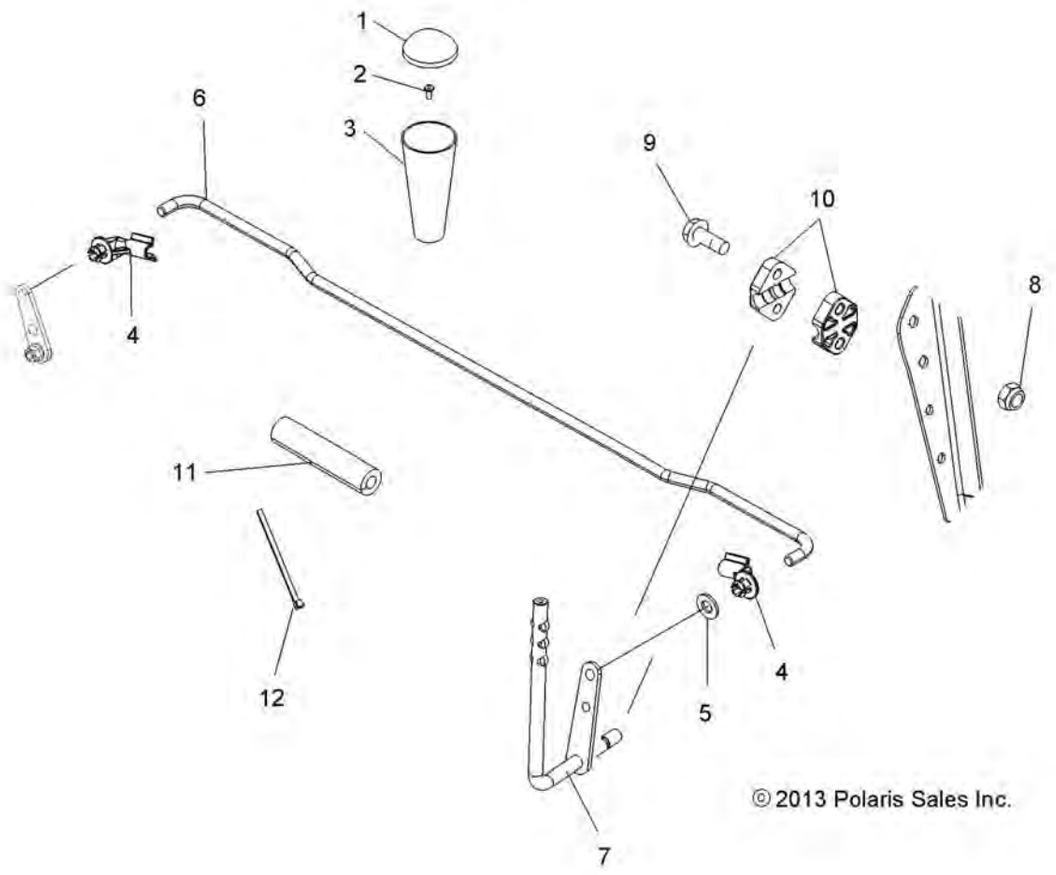
Shift Linkage Inspection

1. Inspect shift linkage rod bushing clips and replace if worn or damaged. Lubrication of rod ends is not required.



REF.	DESCRIPTION	NOTES
1	COVER, SHIFT	
2	SCREW	
3	KNOB, GEAR SELECTOR	
4	BUSHING, SNAP LINKAGE	
5	WASHER, THRUST	
6	ROD, SHIFTER	
7	HANDLE, SHIFT, BLACK	
8	NUT, NYLOK	
9	BOLT	
10	MOUNT, GEAR SELECTOR	
11	HOSE, SLIT	
12	CABLE TIE	

Gear Selector Removal

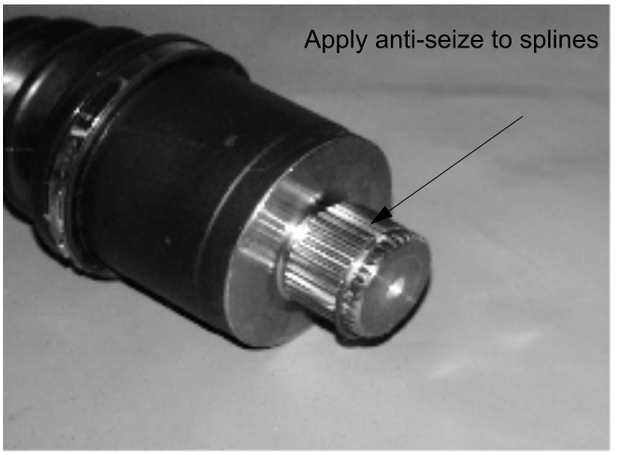
1. Push linkage rod out of bushing clip to remove.
2. Remove screws attaching gear selector mount to frame.
3. Remove gear selector handle by prying the cover off and removing the retaining screw.

Transmission Removal

1. Place vehicle in “park”. Raise and securely support rear of ATV under the frame. Remove both rear wheels.
2. Disconnect the BLACK (negative) battery cable from the battery.
3. Remove:
   - Seat
   - Side Panels
   - Rear Rack/Rack Support
   - Rear Cab Assembly
   - Left/Right Foot Wells
4. Disconnect the vehicle speed sensor and gear selection switch connectors from the transmission.
5. Disconnect transmission vent hose from the nozzle.
6. Disconnect shift rod end from transmission bellcrank.
7. Remove PVT outer cover, drive and driven clutches, and the inner PVT cover. (refer to Clutch Removal in Chapter 6).
8. Remove fasteners securing upper control arms to stabilizer brackets and transmission brackets.
9. Remove the stabilizer bar links from the upper control arms. Remove lower shock-to-control arm fasteners.
10. Remove both rear drive shafts from transmission.
11. Remove the fasteners securing the stabilizer assembly to the upper frame.
12. Remove the two mounting bolts that secure the front of the transmission to the frame.
13. Remove all lower transmission mounting fasteners from each side.
14. Remove the upper transmission support bracket completely from the ATV.
15. With the help of an assistant, lift and remove transmission out of rear of frame while pulling the output shaft from the propshaft yoke.

Transmission Installation

1. Apply Polaris Premium All Season Grease (PN 2871423) to splines of front output shaft ,install new O–ring in prop shaft.
2. With the help of an assistant, install transmission into place from the rear of the frame, ensuring that the output shaft and propshaft align and slide together.
3. Loosely install the bottom and front transmission-to-frame screws and through-bolts.
4. Loosely install the upper transmission mount bracket to the transmission and upper frame rail.
5. Reinstall the stabilizer bar assembly. Loosely install the screws that secure the assembly to the frame, and then the bolts/screws that attach the brackets to the transmission.
6. Apply anti-seize to splines of rear drive shafts and insert drive shafts into transmission. Install the upper control arms into the transmission/stabilizer assembly brackets to retain the rear suspension.



7. Install the stabilizer bar links and shocks into the upper control arms.
8. Install PVT system. Refer to Chapter 6 PVT section for procedures and torque specifications.
9. Install transmission vent line. Be sure vent line is not kinked or pinched.
10. Reconnect the speed sensor and gear selection switch connectors to the transmission.
11. Reconnect the shift rod.
12. Reinstall:
    - Seat
    - Side Panels
    - Rear Rack/Rack Support
    - Rear Cab Assembly
    - Left/Right Foot Wells

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13. Install the rear wheel nuts and torque to specification.

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Rear Wheel Nut: Refer to Chapter 2

14. With the ATV on level ground, add Polaris AGL Plus Gearcase Lubricant to the proper level. See Chapter 2 for proper fill procedures and Torque Specifications.

Polaris AGL Gearcase Lubricant **(PN 2878068) (12 oz.)** **(PN 2878069) (Gallon)**

Troubleshooting Checklist

Check the following items when shifting difficulty is encountered.

- Idle speed adjustment
- Transmission oil type/quality
- Drive belt deflection
- *Worn, broken or damaged internal transmission components

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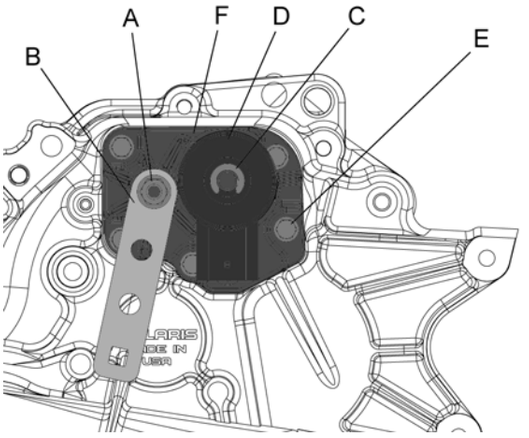
TRANSMISSION DISASSEMBLY / ASSEMBLY

Transmission Disassembly

NOTE: Refer to the exploded view at the end of this chapter as a reference.

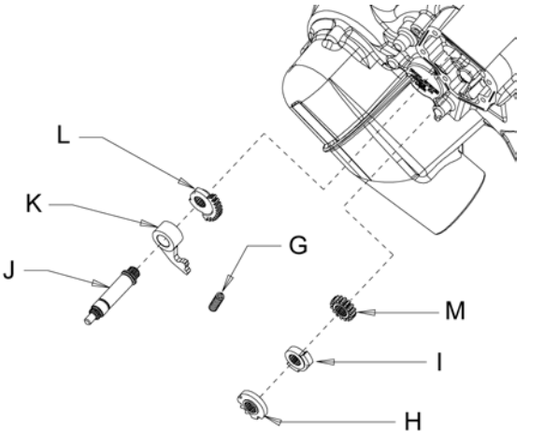
1. Place the transmission in Reverse before disassembly.
2. Drain and properly dispose of the transmission lubricant (see Chapter 2).
3. Remove the shift rod from the bellcrank (B).
4. Remove the bellcrank nut (A) and bellcrank (B).



5. Remove the E-clip (C) that retains the gear selector switch (D) and remove the switch.
6. Remove the sector cover bolts (E) and remove the sector cover (F).

   NOTE: Removal can be aided by using your thumbs to press down on the shafts while pulling up the cover with your fingers.

7. Remove the compression spring (G).



8. Remove the detent star (H). Note how the detent star fits onto the splined shaft with the raised edge facing outward for reassembly.
9. Remove the lockout disc (I). Note the raised edge facing outward for reassembly.
10. Remove the shift shaft (J), detent pawl (K) and the shift gears (L and M).

    NOTE: Note the timing marks on the shift gears (L and M) for reassembly purposes.

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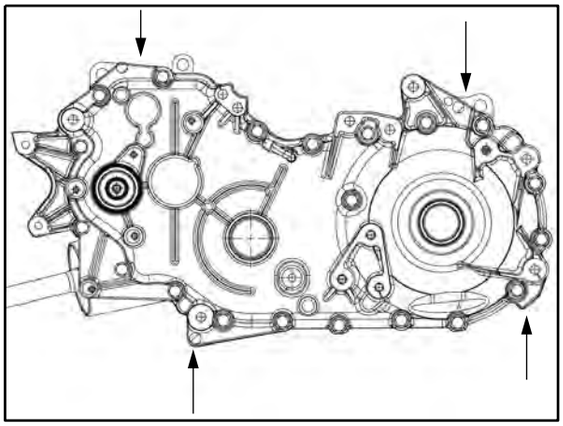
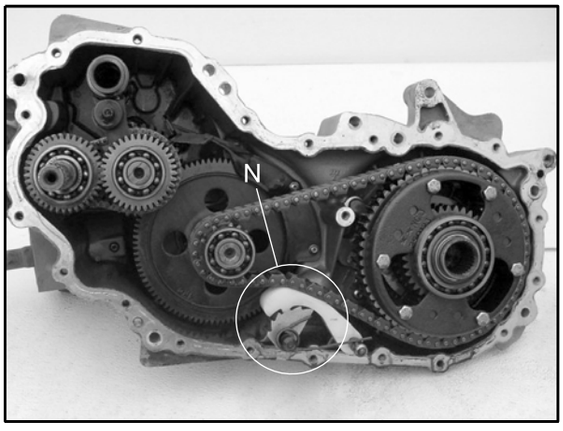
11. Remove all the transmission cover bolts. Using suitable pry bars, remove the cover using the designated pry points (indicated by the black arrows in the illustration below). Tap cover with soft face hammer to remove.



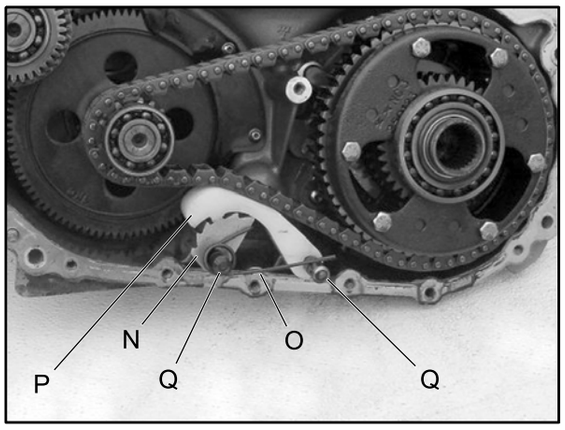
CAUTION

Do not pry on case sealing surfaces.
Use only the designated pry points
on the transmission.

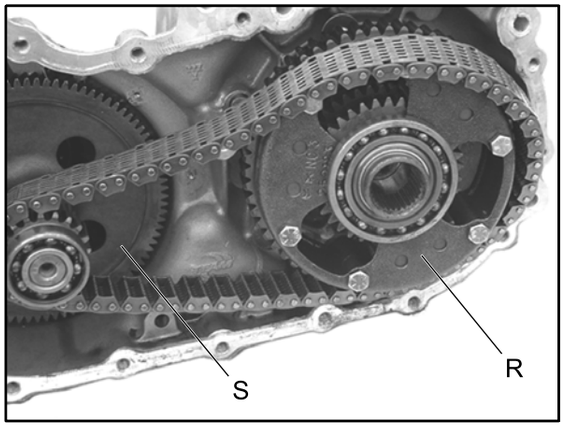
12. Note location of chain tensioner cam (N). If fully extended, chain is worn beyond service limit and should be replaced along with the chain tensioner shoe.



13. Remove the cam chain tensioner spring (O). Slide the cam chain tensioner shoe (P), pins (Q) and cam chain tensioner cam (N) from the assembly.



14. Remove the differential gear (R) and chain by gently prying underneath or tapping the differential gear from the opposite side until it tips toward the output gear (S). The differential gear is connected to the shift fork and must slide backwards to clear the fork arms once the chain is removed.



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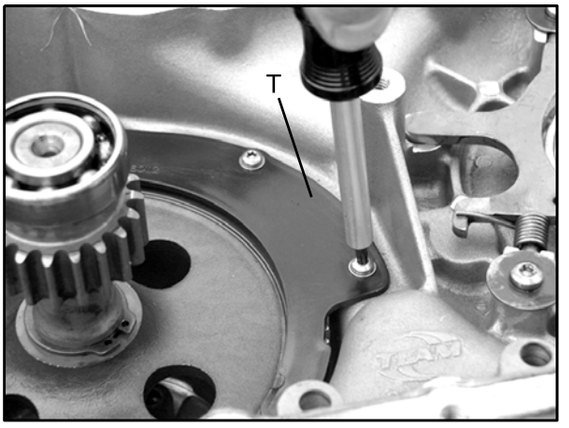
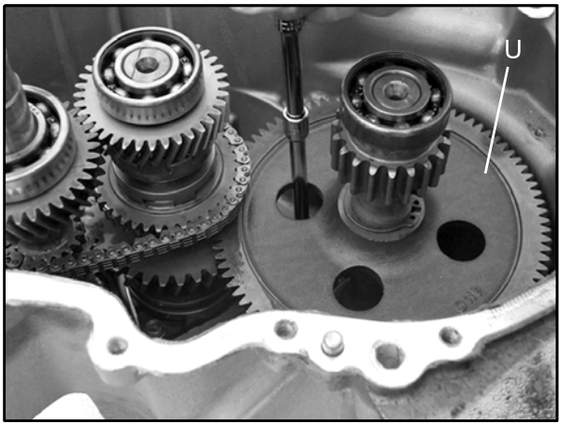
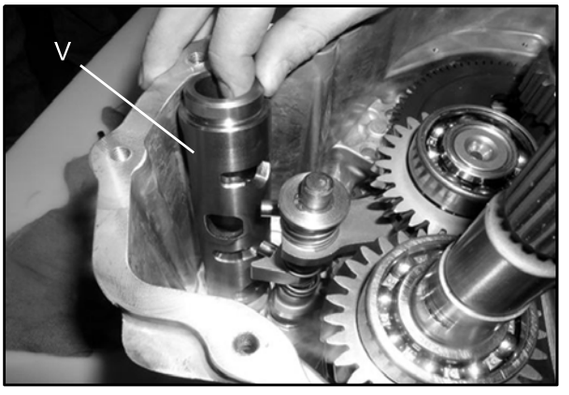
15. Using a T20 Torx driver, remove the screws that secure the oil deflector (T).



16. Using a T27 Torx driver, remove the screws that secure the output gear (U).

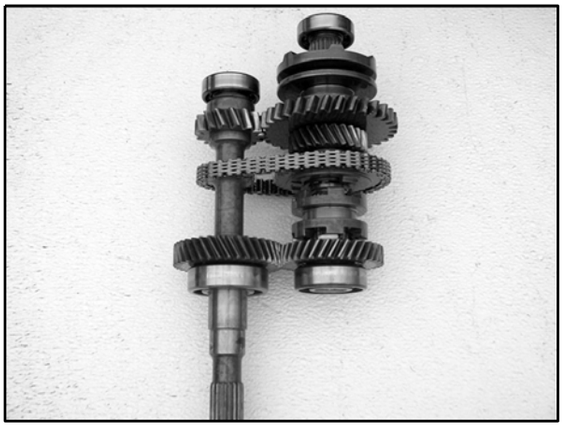


17. Remove the shift drum (V) from the gearcase by moving the drum up and to the right to clear the shift shaft.



18. Remove the output gear (U) and gear cluster assembly from the gearcase by pulling both assemblies straight up.

19. Place the gear cluster assembly on a clean surface for inspection.



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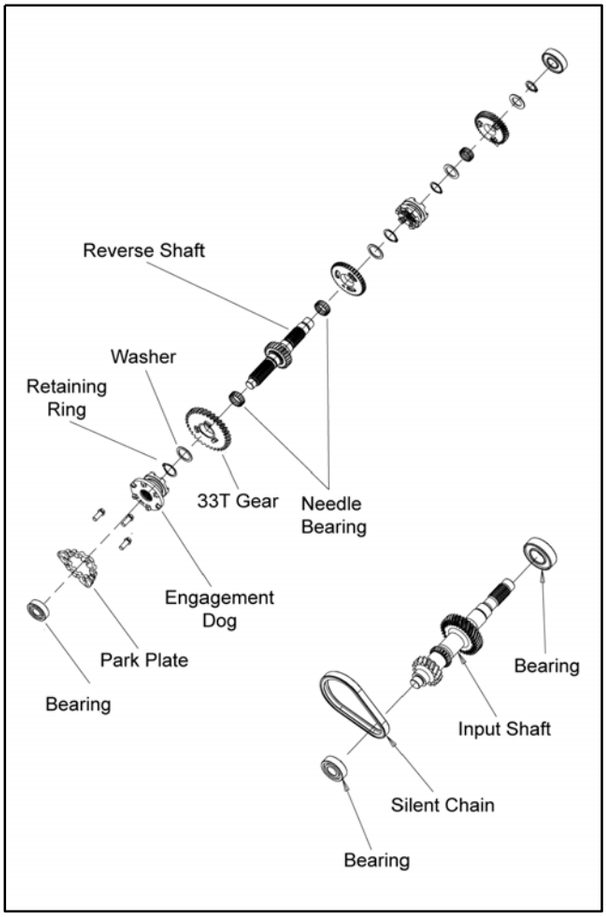
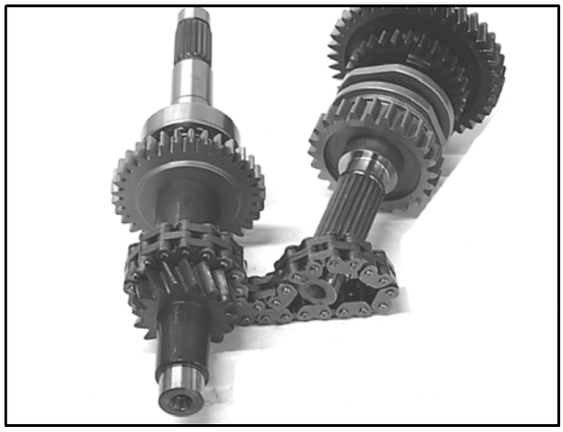
Gear Cluster Disassembly

20. Remove the bearing from the reverse shaft using a bearing puller. Slide the engagement dog off of the reverse shaft (see Figure 8-1).



21. Remove the retaining ring and washer from the reverse shaft (see Figure 8-1).
22. Remove the bearing from the input shaft using a bearing puller (see Figure 8-1).
23. Remove the 33T gear and needle bearing from the reverse shaft (see Figure 8-1).
24. The reverse shaft should slide out of the silent chain to separate the assembly.



25. Remove the rest of the ball bearings from each shaft.
26. Disassemble the other end of the reverse shaft. Remove the retaining ring, washer, gear and needle bearing from the reverse shaft (see Figure 8-2).

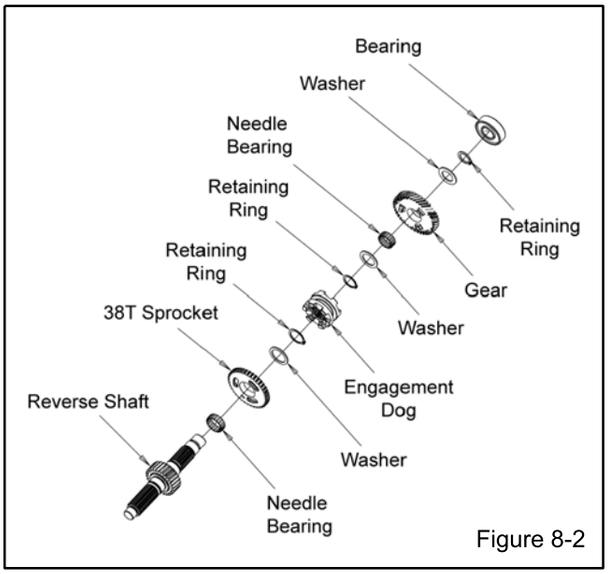


Figure 8-2

27. Remove the washer, retaining ring and engagement dog from the reverse shaft (see Figure 8-2).
28. Remove the retaining ring, washer, 38T sprocket and needle bearing from the reverse shaft (see Figure 8-2).

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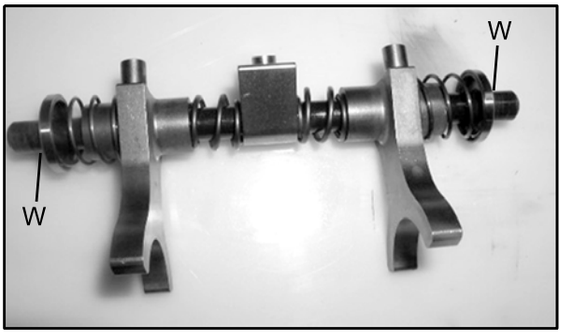
29. To disassemble the shift fork rail remove the snap ring (W) from the end of the shift rail on either side.

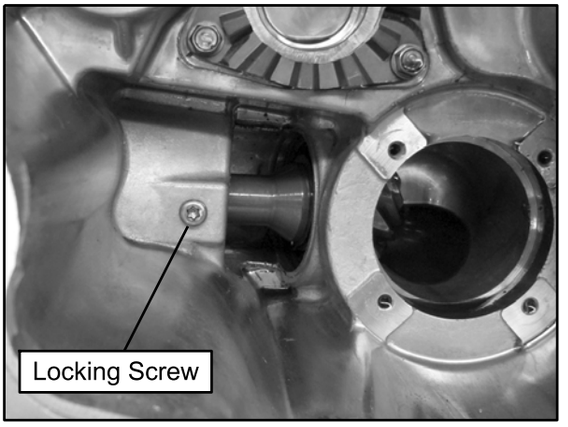


CAUTION

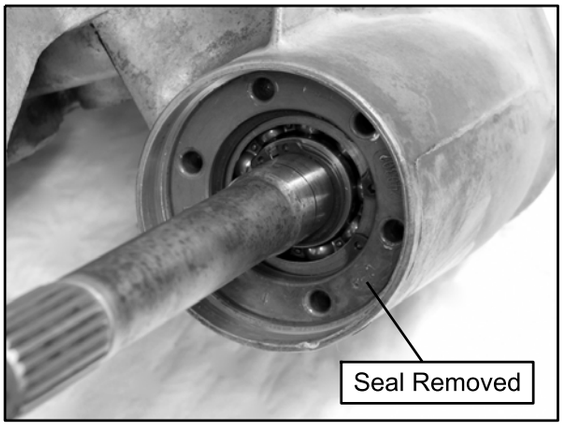
Use caution when disassembling the shift rail. The compressed springs on the shift rail may pop off causing eye or face injury.

Snorkel Shaft Removal / Disassembly

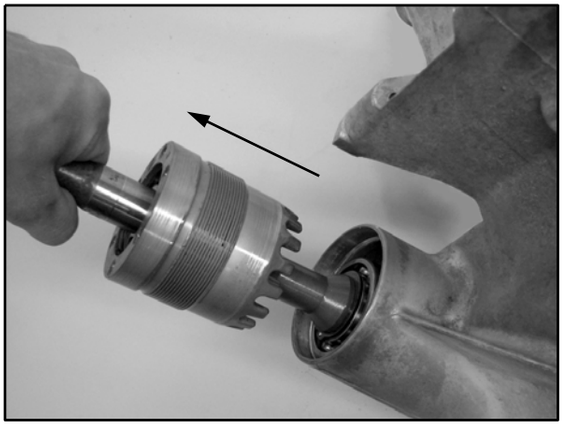
30. Using a T27 Torx driver, remove the snorkel tube locking screw located inside the gearcase.

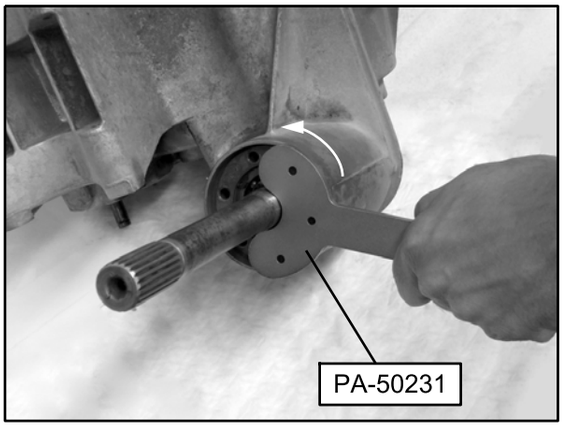


31. Remove the seal from the snorkel shaft to access the snorkel tube for removal.



32. Using the Snorkel Tool (PA-50231), loosen and remove the snorkel tube and shaft assembly.





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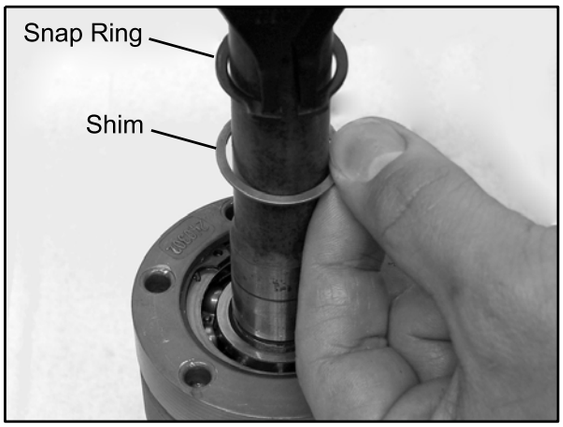
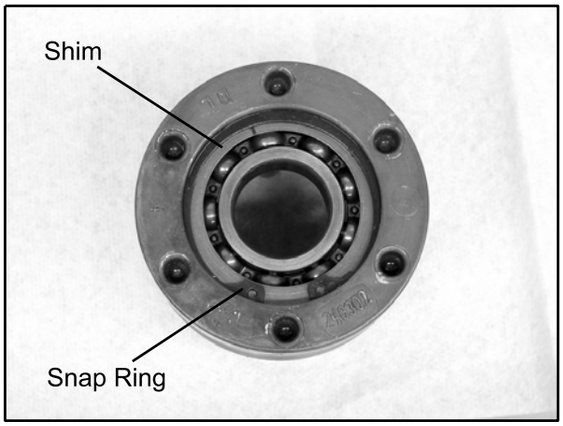
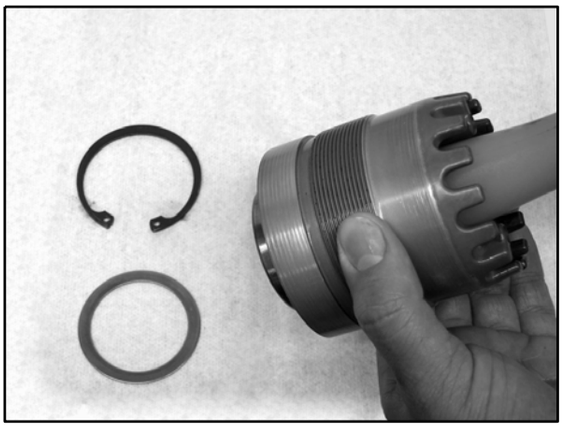
33. Remove the snap ring and shim from the snorkel shaft.



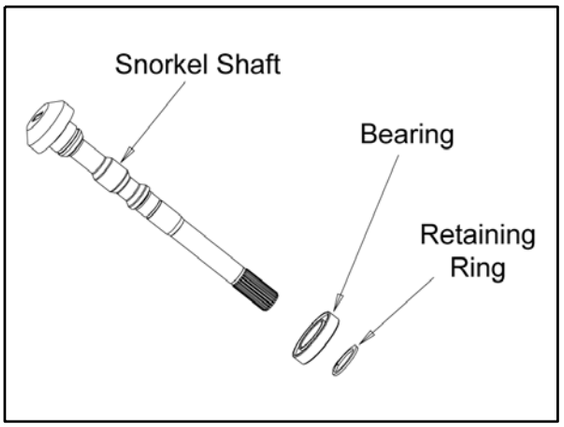
34. Use an arbor press to remove the snorkel tube from the snorkel shaft.
35. Remove the snap ring and shim retaining the bearing in the snorkel tube.



36. Lightly tap on the bearing from the opposite side to remove it from the snorkel tube.



37. To remove the remaining bearing on the snorkel shaft, remove the retaining ring and press the bearing off.



38. Remove all seals from the gearcase halves and clean the cases in preparation for assembly.

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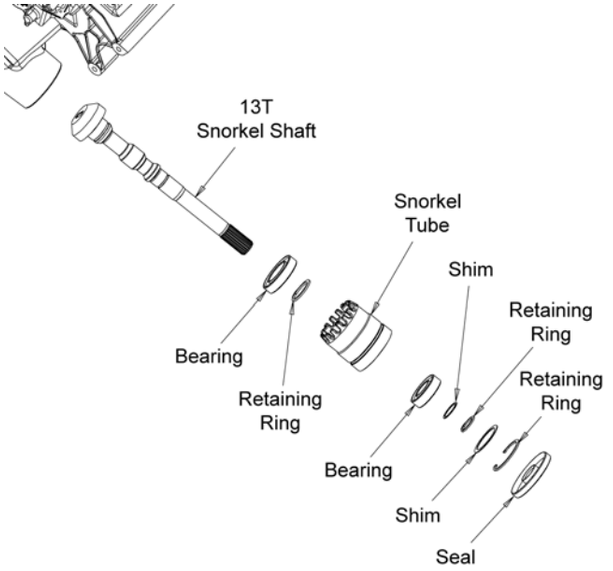
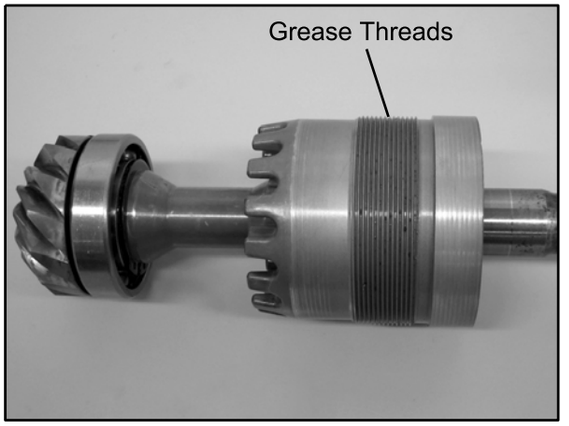
Snorkel / Output Gear Backlash Procedure

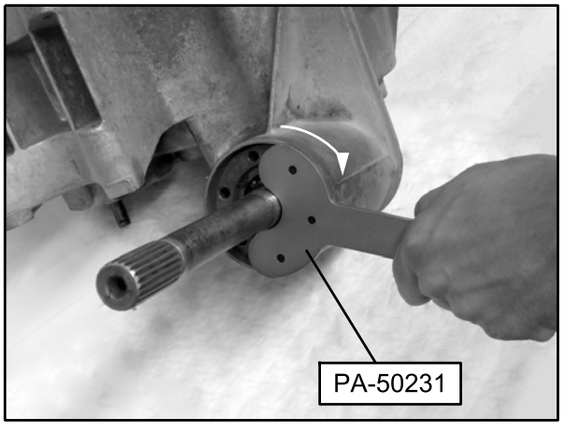
1. Reassemble the snorkel shaft assembly by reversing the disassembly procedure (see “Transmission Snorkel Shaft Removal / Disassembly” in previous section).



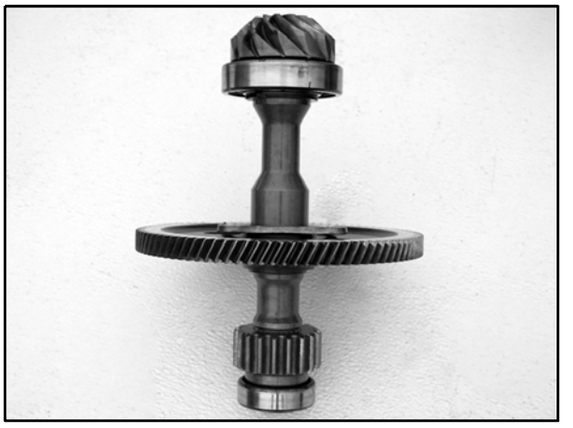
2. Apply a small amount of white lithium grease on the threads of the snorkel tube.



3. Install the snorkel shaft into the gearcase. Using the Snorkel Tool (PA-50231), tighten the snorkel tube about 10 full rotations. **Do not completely tighten the snorkel tube.**



4. Inspect the output gear assembly and replace bearings if needed. Inspect each gear for damage, chips or abnormal worn teeth.



5. Install the output gear assembly. Be sure to properly mesh the snorkel shaft bevel gear with the output bevel gear.

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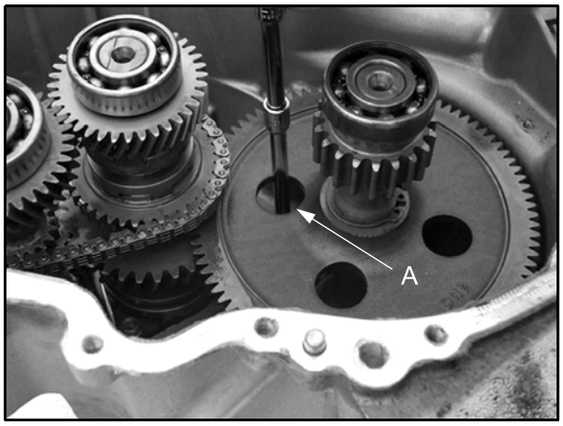
6. Install the 4 torx screws (A) that secure the output gear assembly. Torque the screws to specification.



= T
Output Gear Retaining Screws: **8-12 ft-lbs (11-16 Nm)**

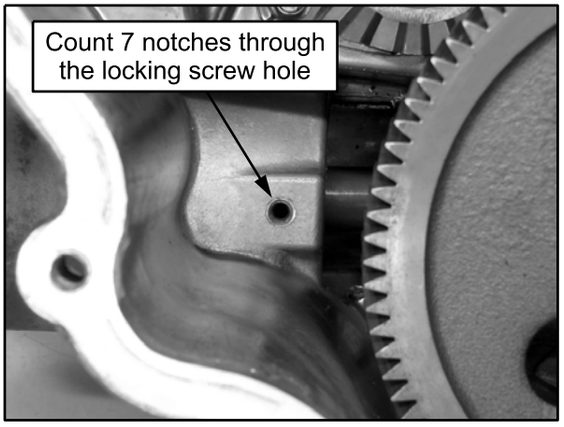
7. Tighten the snorkel tube until it is lightly seated using the snorkel tool (PA-50231). Turn the output shaft to prevent binding while tightening the snorkel tube. Make sure the snorkel shaft gear and output bevel gear have 'zero' lash.

   NOTE: It is important to have zero lash between the output gear and the snorkel shaft gear. If there is binding or excess lash, tighten or loosen the snorkel shaft until there is zero lash.

   Do not overtighten the snorkel tube. Gears should rotate freely without binding.

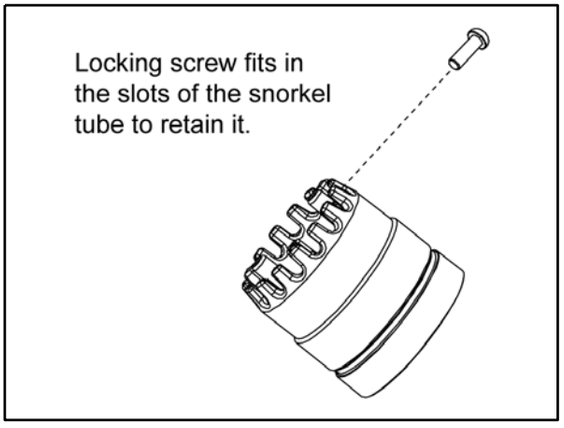
8. Look down into the gearcase at the snorkel locking screw hole opening to reference your starting point.

9. Slowly rotate the snorkel tube counterclockwise while counting the number of notches passing through the hole opening as you rotate the tube. Rotate the snorkel tube to the **7th** notch from the 'seated' position obtained in step 7.



10. Check the output shaft gear backlash again by feel. If the output shaft lash appears to be too tight, rotate the snorkel shaft counterclockwise to the next notch.

11. Once the backlash is set, apply Loctite 242® to the threads and install the locking screw to secure the snorkel tube.



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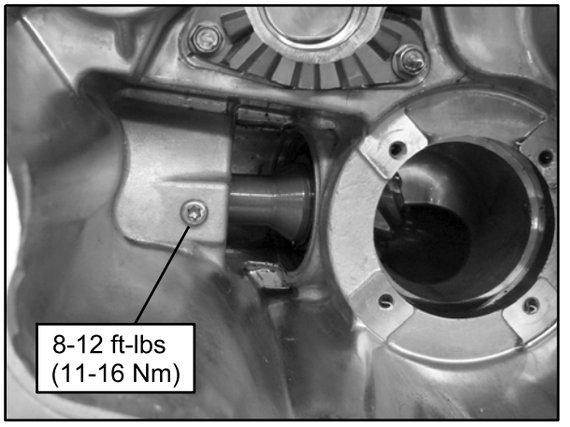
12. Torque the locking screw to specification.



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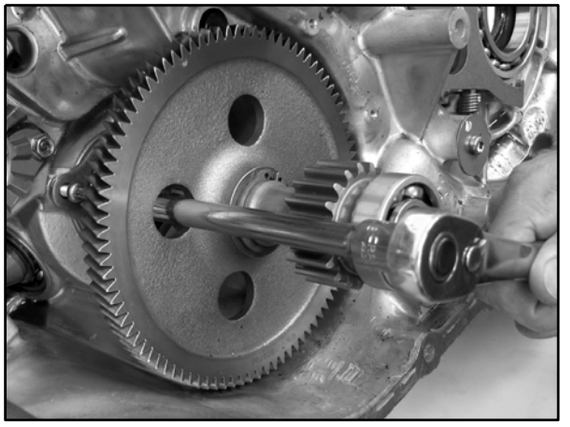
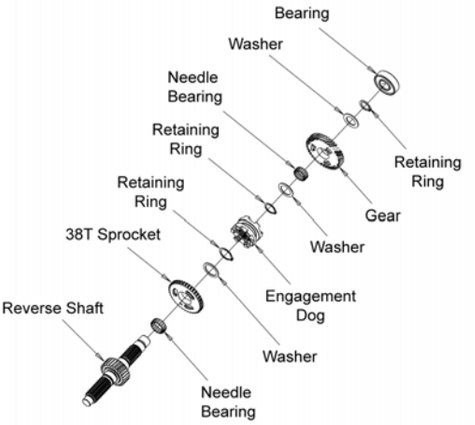
Snorkel Locking Screw: **8-12 ft-lbs (11-16 Nm)**

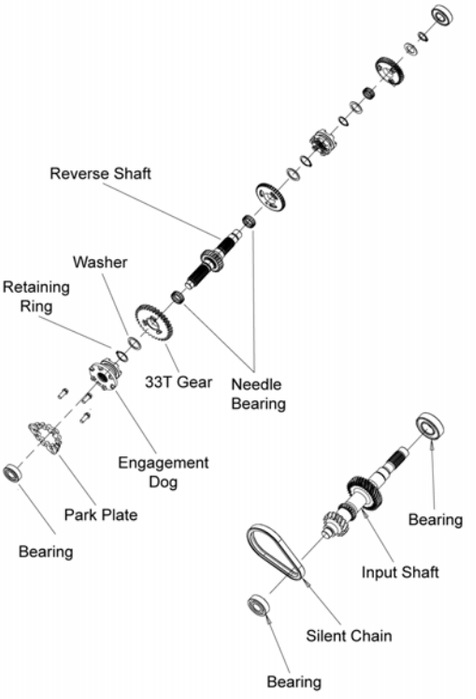
13. With the snorkel shaft assembly properly installed, remove the (4) Torx screws and remove the output shaft assembly.



Transmission Assembly

1. Assemble the reverse shaft assembly and input shaft assembly if previously disassembled (see illustrations).





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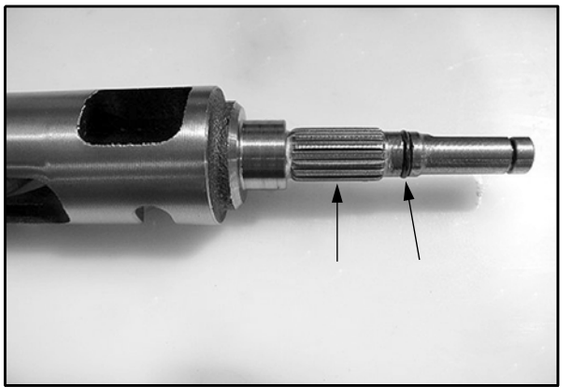
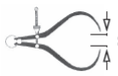
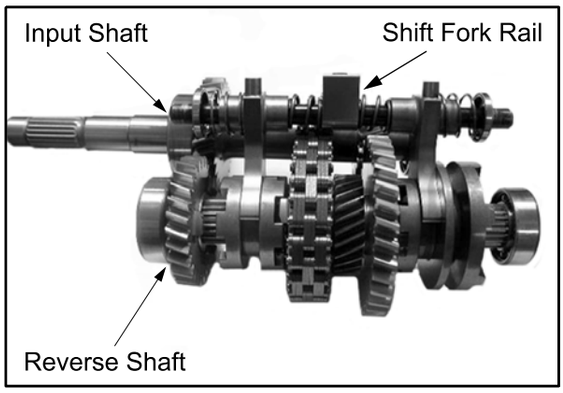
2. Inspect the shift drum for any damage or wear. Inspect the splines of the shift drum. Replace the O-ring on the end of the shift drum and lubricate it before assembly.



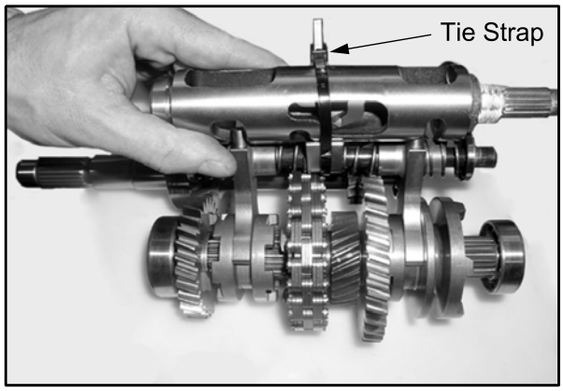
3. Stretch the silent chain on a flat surface and measure the length of 8 pitches in a minimum of three places on the chain. Replace the chain if the measurement is longer than the service limit.

 = In. / mm.
Silent Chain Service Limit (8 pitch): **3.090” (7.849 cm)**

4. The shift drum, reverse shaft, input shaft, shift fork rail and output gear assembly must be installed at the same time to properly align all components.



NOTE: To ease assembly use a plastic tie strap to hold the shift forks and the shift drum together during assembly.



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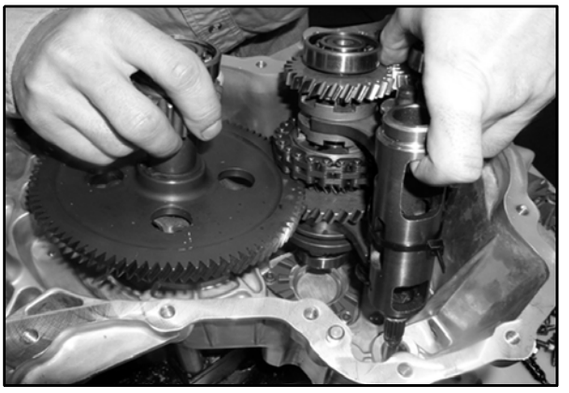
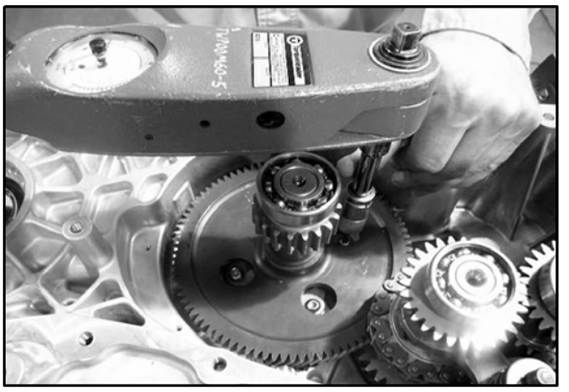
5. With the gearcase on it's side, hold the gear cluster assembly and output assembly together. Carefully install each shaft into their respective recess in the gearcase.



6. With all the components in the correct position, install the (4) output gear assembly retaining screws. Apply Loctite 242® to the threads of the screws. Torque the screws to specification.

   NOTE: If the transmission is in gear, place the transmission in Neutral.



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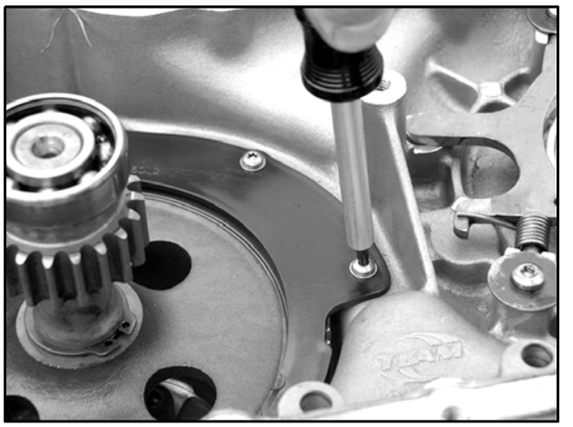
Output Gear Retaining Screws: **8-12 ft-lbs (11-16 Nm)**

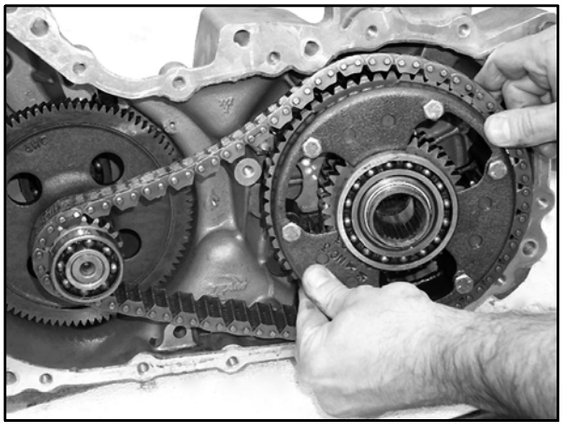
7. Install the oil deflector shield into the gearcase. Apply Loctite 242® to the threads of the screws. Torque the screws to specification.



= T
Oil Deflector Retaining Screws: **20-30 in-lbs (2.3-3.4 Nm)**

8. Install the rear drive differential and drive chain, following these precautions:

   - The case half rear output seal should be removed prior to installation of the differential, as seal damage can occur with seal installed due to the angle of entry.
   - Install the differential sliding geardog onto the shift fork arms at the same time the silent chain is installed.
   - The differential gear bearing may be lightly tapped into place. The output seal can be installed once the assembly is in place.



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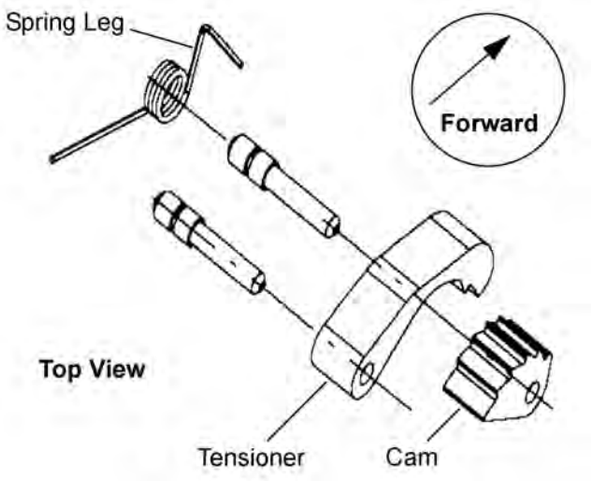
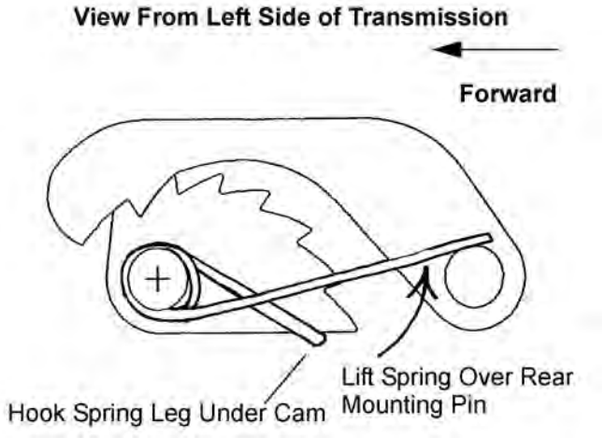
9. Tensioner Installation:

   NOTE: Case-halve mating may be difficult due to tensioner pressure on the silent chain during installation. Release tension at the ratcheting cam to aid case half installation. Release the tensioner spring after the case halves are mated but not yet touching.

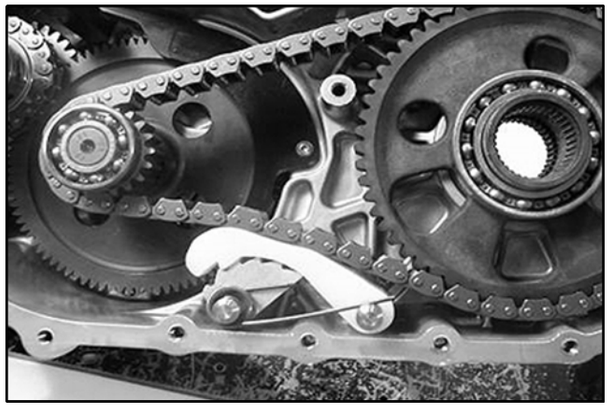
   - **Assemble the tensioner cam and tensioner shoe and place them into the transmission.**
   - **Insert the front pin through the tensioner cam and the rear pin through the tensioner shoe.**



   - **Place the spring over the front pin and hook the spring leg under the cam.**



   - **Lift the end of the spring up and over the rear pin. The tensioner cam will lift the shoe to provide chain tension.**



10. Apply a continuous bead of Crankcase 3 Bond Sealant (PN 2871557) to the LH gearcase mating surface and install the cover. Install and tighten the 20 screws in an even criss-cross pattern to evenly secure the cover. Torque the screws to specification.

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Gearcase Cover Bolts: **25-30 ft-lbs (34-41 Nm)**

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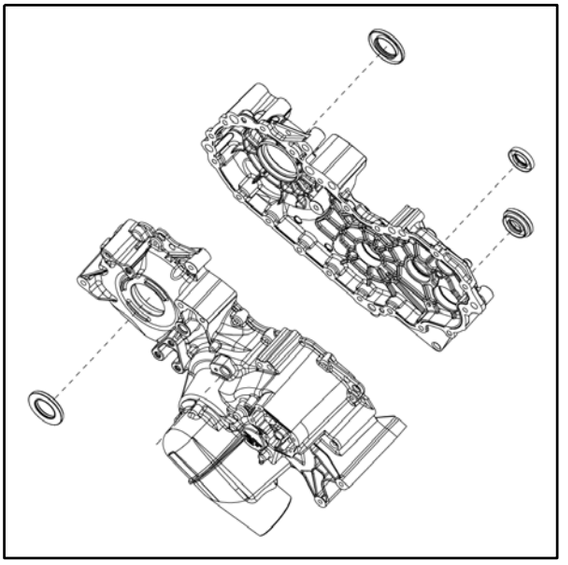
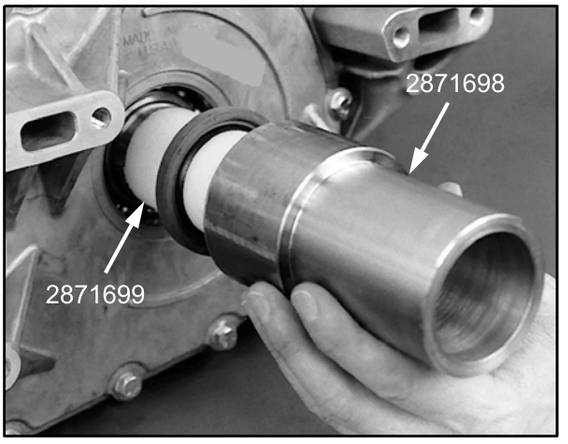
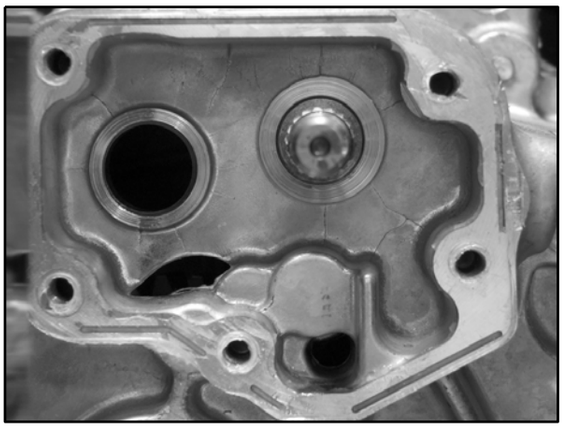
11. Install all new seals into the gearcases. Use the Rear Output Seal Driver (PN 2871698) and Rear Driveshaft Seal Guide (PN 2871699) to install the seals into the gearcase halves (refer to the following illustration to identify the seals needing replacement).

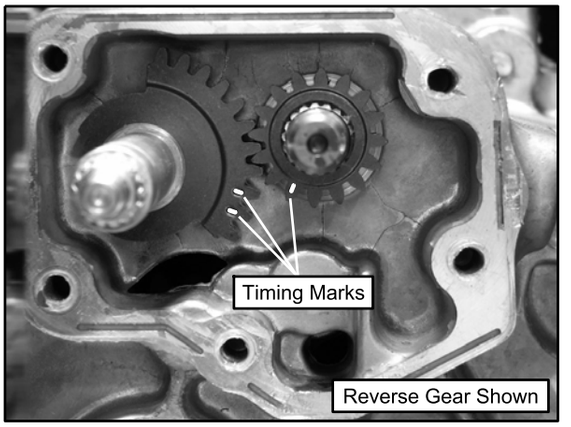




12. Thoroughly clean the shift shaft housing. **Be sure the transmission is in Reverse prior to reassembly.**



13. Install the sector gear (16T) onto the shift drum shaft. Install the shift shaft assembly and sector gear (11T) into the bushing pocket on the left side. Align the timing marks on the gears as shown.



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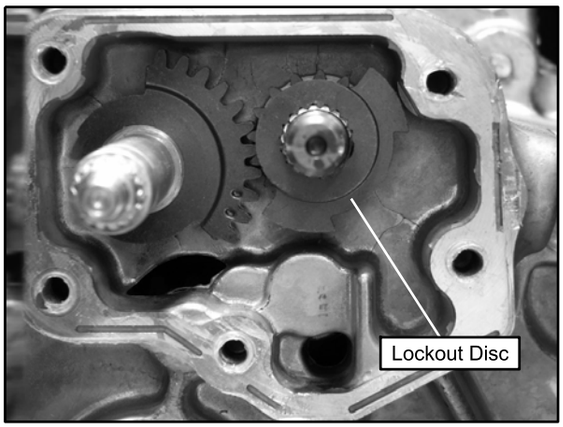
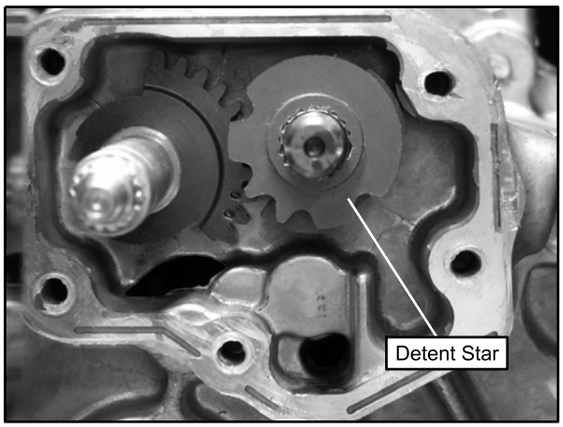
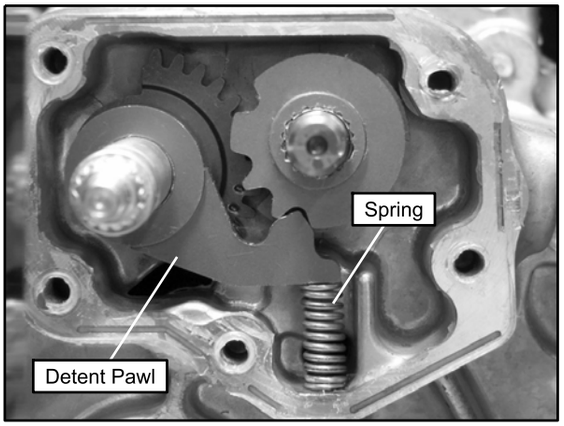
14. Install the lockout disc onto the shift drum shaft. Be sure to install the lockout disc with the raised edge facing outward.



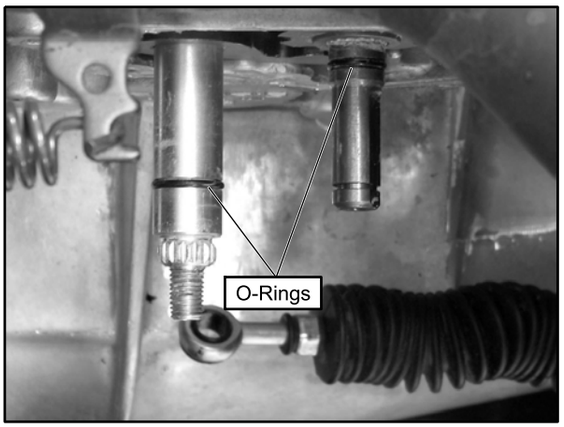
15. Install the detent star onto the shift drum shaft. Be sure to install the detent star with the raised edge facing outward.



16. Install the detent pawl onto the shift shaft and carefully install the compression spring.



17. Install a new O-ring on each shift shaft. Apply a small amount of white lithium grease on the O-rings, shift shafts and component contact surfaces prior to installing the sector cover.



18. Apply Crankcase Sealant (3-Bond) (PN 2871557) onto the cover and transmission case mating surface. Install the sector cover and torque the bolts to specification.

= T
Sector Cover Bolts: **8-12 ft-lbs (11-16 Nm)**

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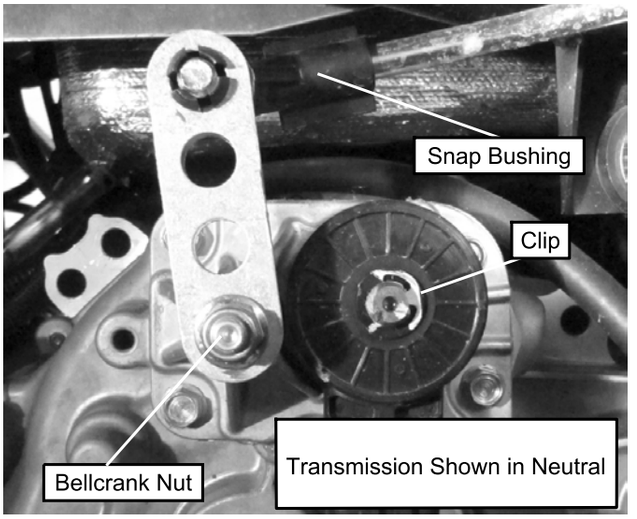
19. Install the bellcrank onto the shift shaft. **Note the key splined on the bellcrank and shift shaft.** Install the nut and torque to specification.

= T
Bellcrank Nut: **12-18 ft-lbs (16-24 Nm)**

20. Install the shift shaft onto the bellcrank end (if removed) and secure with the snap bushing.



NOTE: Image is for reference only.

21. Install the transmission gear selector switch and secure the switch with the retaining ring.

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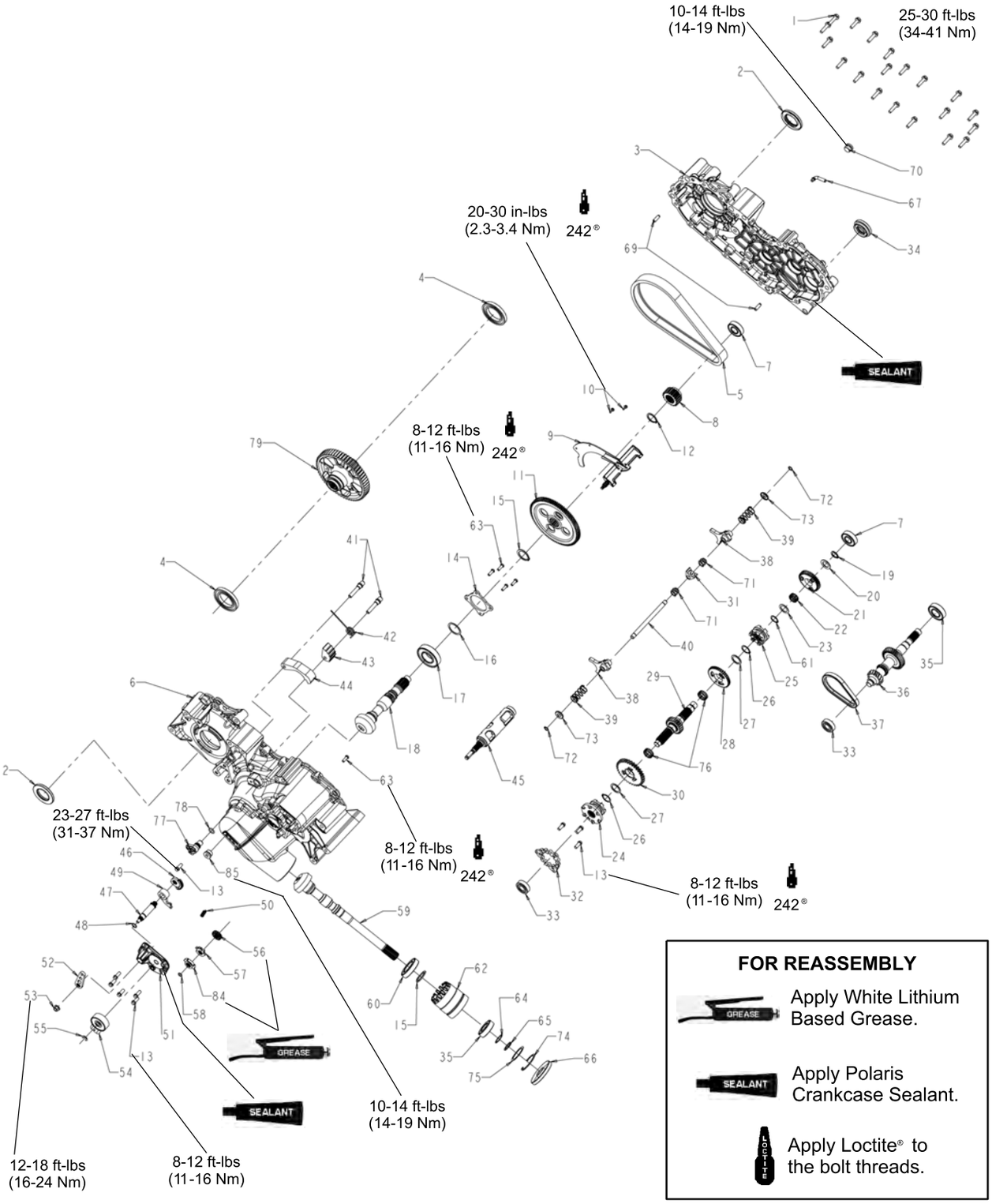
SPORTSMAN TRANSMISSION EXPLODED VIEW



Sportsman Transmission Exploded View, Continued

REF.	QTY.	DESCRIPTION
1.	20	Screw
2.	2	Triple Lip Seal
3.	1	LH Gearcase
4.	2	Ball Bearing
5.	1	Silent Chain
6.	1	RH Gearcase
7.	2	Ball Bearing
8.	1	Sprocket, 19 T
9.	1	Oil Deflector
10.	2	Screw
11.	1	Output Gear, 91 T
12.	1	Retaining Ring
13.	9	Screw
14.	1	Bearing Cover
15.	2	Retaining Ring
16.	1	Shim
17.	1	Ball Bearing
18.	1	Center Drive Shaft
19.	1	Retaining Ring
20.	1	Thrust Washer
21.	1	Gear, 36 T
22.	1	Needle Bearing
23.	1	Washer
24	1	Engagement Dog
25.	1	Engagement Dog
26.	2	Retaining Ring
27.	2	Washer
28.	1	Sprocket, 38 T
29.	1	Reverse Shaft, 26 T
30.	1	Gear, 33 T
31.	1	Shift Collar
32.	1	Park Plate
33.	2	Ball Bearing
34.	1	Seal
35.	2	Ball Bearing
36.	1	Input Shaft
37.	1	Chain
38.	2	Shift Fork
39.	2	Compression Spring
40.	1	Shift Rail

REF.	QTY.	DESCRIPTION
41.	1	Tensioner Pin
42.	1	Torsion Spring
43.	1	Chain Tensioner Cam
44.	1	Chain Tensioner Shoe
45.	1	Shift Drum
46.	1	Sector Gear, 31 T
47.	1	Shift Shaft
48.	1	O-Ring
49.	1	Detent Pawl
50.	1	Compression Spring
51.	1	Sector Gear Cover
52.	1	Bellcrank
53.	1	Lock Nut
54.	1	Shift Switch
55.	1	Retaining Ring
56.	1	Sector Gear, 16 T
57.	1	Detent Star
58.	1	O-Ring
59.	1	Snorkel Shaft
60.	1	Ball Bearing
61.	1	Retaining Ring
62.	1	Snorkel Tube
63.	5	Screw
64.	1	Shim
65.	1	Retaining Ring
66.	1	Triple Lip Seal
67.	1	Vent Tube
69.	2	Dowel Pin
70.	1	Plug
71.	2	Compression Spring
72.	2	Retaining Ring
73.	2	Cup Washer
74.	1	Retaining Ring
75.	1	Shim
76.	1	Needle Bearing
77.	1	Speed Sensor
78.	1	O-Ring
79.	1	Output Shaft
84.	1	Lockout Disc
85.	1	Magnetic Plug

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CHAPTER 9
BRAKES

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GENERAL INFORMATION

Torque Table

TORQUE SPECIFICATIONS (All Models)

ITEM	TORQUE FT-LBS (IN-LBS)	TORQUE NM
Front / Rear Caliper Mounting Bolts	18	24
Handlebar Master Cylinder Clamp Bolts	(25 in-lbs)	3
Hand Master Cylinder Reservoir Cover Screws	(7 in-lbs)	0.79
Brake Line Banjo Bolt	15	21
Brake Line Flared Fittings	12-15	16-21
Brake Disc Bolts Front / Rear	18 Front 27 Rear	24 Front 37 Rear
Brake Switch	12-15	16-21
Caliper Mounting Bolts	18	24
Sportsman Caliper Slide Pins	30-35	41-48
Rear Master Cylinder-to-Frame Bolts	8	11

NOTE: Refer to tightening procedures in this chapter. Some special procedures are used when torquing certain bolts and fasteners.

Component Service Limits

FRONT BRAKE CALIPER (All Models)

ITEM	STANDARD	SERVICE LIMIT
Brake Pad Thickness	.290” / 7.6 mm	.180” / 4.6 mm
Brake Disc Thickness	.150-.165” / 3.81-4.19 mm	.140” / 3.556 mm
Brake Disc Thickness Variance Between Measurement	–	.002” / .051 mm
Brake Disc Runout	–	.010 / .254 mm

REAR BRAKE CALIPER (All Non Touring Models)

ITEM	STANDARD	SERVICE LIMIT
Brake Pad Thickness	.298” / 7.6 mm	.180” / 4.6 mm
Brake Disc Thickness	.180-.195” / 4.57-4.95 mm	.170” / 4.318 mm
Brake Disc Thickness Variance Between Measurements	–	.002” / .051 mm
Brake Disc Runout	–	.010” / .254 mm

REAR BRAKE CALIPER (All Touring)

ITEM	STANDARD	SERVICE LIMIT
Brake Pad Thickness	.290” / 7.4 mm	.180” / 4.6 mm
Brake Disc Thickness	.180-.195” / 4.57-4.95 mm	.170” / 4.318 mm
Brake Disc Thickness Variance Between Measurements	–	.002” / .051 mm
Brake Disc Runout	–	.010” / .254 mm

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Special Tools

PN 2870975 Mity Vac®

Bosch Automotive Service Solutions: 1-800-328-6657 or online at http://polaris.service-solutions.com

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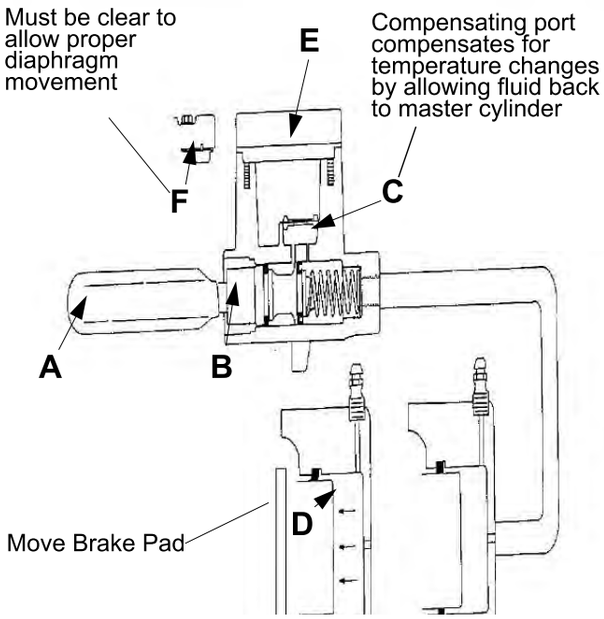
HYDRAULIC BRAKE SYSTEM

Operation Overview



The Polaris disc brake system consists of the following components or assemblies: brake lever; master cylinder; hydraulic hose; brake calipers (slave cylinder); brake pads; and brake discs, which are secured to the drive line.

When the hand activated brake lever (A) is applied it contacts piston (B) within the master cylinder. As the master cylinder piston moves inward it closes a small opening (compensating port C) within the cylinder and starts to build pressure within the brake system. As the pressure within the system is increased, the piston (D) located in the brake caliper moves outward and applies pressure to the brake pad. This pad contacts the brake disc and moves the caliper in its floating bracket, pulling the stationary side pad into the brake disc. The resulting friction reduces brake disc and vehicle speed. As the lever pressure is increased, the braking affect is also increased.

The friction applied to the brake pads will cause the pads to wear. As these pads wear, the piston within the caliper moves further outward and becomes self adjusting. Fluid from the reservoir fills the additional area created when the caliper piston moves outward.

Brake fluid level is critical to proper system operation. Too little fluid will allow air to enter the system and cause the brakes to feel spongy. Too much fluid could cause brakes to drag due to fluid expansion.

Located within the master cylinder is the compensating port (C) which is opened and closed by the master cylinder piston assembly. The port is open when the lever is released and the master cylinder piston is outward. As the temperature within the hydraulic system changes, this port compensates for fluid expansion (heated fluid) or contraction (cooled fluid). During system service, be sure this port is open. Due to the high temperatures created within the system during heavy braking, it is very important that the master cylinder reservoir has adequate space to allow for fluid expansion. **Never overfill the reservoir!** Fill to 1/4, - 5/16, (.64 - .80 cm) from top of the cylinder.

This system also incorporates a diaphragm (E) as part of the cover gasket; and a vent port (F) located between the gasket and the cover. The combination diaphragm and vent allow for the air above the fluid to equalize pressure as the fluid expands or contracts. Make sure the vent is open and allowed to function. If the reservoir is over filled or the diaphragm vent is plugged the expanding fluid may build pressure in the brake system leading to brake fail

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Brake Controls Overview

All Models (Excluding Forest and Intl.)

The Sportsman brake system consists of a complete hydraulic brake system. All-wheel braking is integrated into the hand brake systems and rear-wheel braking may be applied by pressing the auxiliary pedal. Either control may be applied separately, or at the same time.

When the foot brake is applied, the rear brake caliper is active, as braking pressure is routed from the foot brake master cylinder through the line to the rear caliper.

When the hand brake is applied, all brake calipers are active, as braking pressure is routed from the hand brake master cylinder through the distribution block, exiting two lines to the front calipers, while the other line feeds the line to the rear caliper.

Forest / Intl.

The Sportsman brake system consists of a complete hydraulic brake system. All-wheel braking is integrated into the foot brake and hand brake systems and allows 4 wheel braking from either control separately, or at the same time.

When the foot brake is applied, all brake calipers are active, as braking pressure is routed from the foot brake master cylinder through the proportioning valve and distribution block, exiting one line to the front calipers, while the other line exits the proportioning valve and feeds the outer line of the rear calipers.

When the hand brake is applied, all brake calipers are active, as braking pressure is routed from the hand brake master cylinder through the distribution block, exiting one line to the front calipers, while the other line feeds the inner line of the rear calipers.

When servicing Polaris ATV brake systems, use only Polaris DOT-approved brake fluid.

⚠ WARNING

Once a bottle is opened, use what is necessary and discard the rest in accordance with local laws. Do not store or use a partial bottle of brake fluid. Brake fluid is hygroscopic, meaning it rapidly absorbs moisture. This causes the boiling temperature of the brake fluid to drop, which can lead to brake fade and the possible loss of control.

Brake Noise Troubleshooting

Dirt or dust buildup on the brake pads and disc is the most common cause of brake noise (squeal caused by vibration). If cleaning does not reduce the occurrence of brake noise, a product such as Permatex Disc Brake Quiet can be applied to the back of the pads. Follow directions on the package. This will keep pads in contact with caliper piston (s) to reduce the chance of squeaks caused by dirt or dust.

POSSIBLE CAUSE	REMEDY
Dirt, dust, or imbedded material on pads or disc	Spray disc and pads with CRC Brakleen™ or equivalent non-flammable aerosol brake cleaner. Remove pads and/or disc hub to clean imbedded material from disc or pads.
Pad(s) dragging on disc (noise or premature pad wear)	Adjust pad stop
Insufficient lever or pedal clearance	Set to proper level
Master cylinder reservoir overfilled	Check brake fluid level, adjust as needed
Master cylinder compensating port restricted, Master cylinder piston not returning completely, Caliper piston (s) not returning	Clean piston(s) seal
Operator error (riding the brake / park brake applied)	Educate operator
Loose wheel hub or bearings	Tighten wheel, hub nuts or replace bearings if worn
Brake disc warped or excessively worn	Replace disc
Brake disc misaligned or loose	Inspect and repair as necessary
Noise is from other source (chain, axle, hub, disc or wheel)	If noise does not change when brake is applied check other sources. Inspect and repair as necessary
Wrong pad for conditions	Change to a softer or harder pad (if available)

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Brake Bleeding / Fluid Change

NOTE: When bleeding the brakes or replacing the fluid, always start with the caliper farthest from the master cylinder.

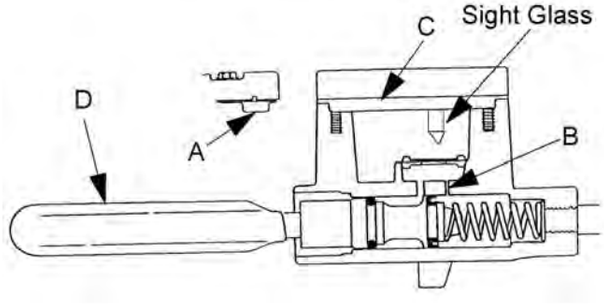
CAUTION

Always wear safety glasses during these procedures. Brake fluid will damage finished surfaces. Do not allow brake fluid to come in contact with finished surfaces.

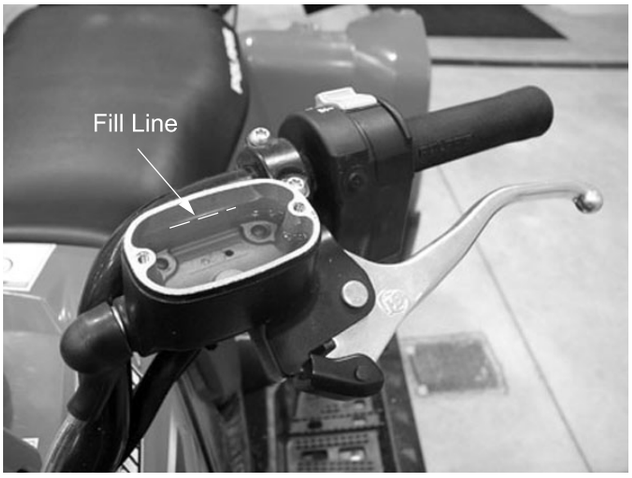
NOTE: Do not remove brake lever when reservoir fluid level is low.

This procedure should be used to change fluid or bleed brakes during regular maintenance.

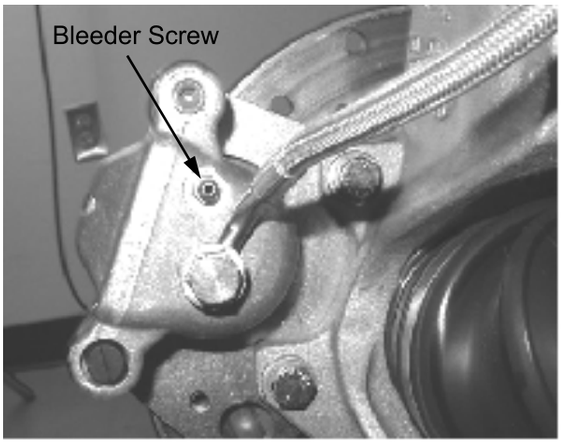
1. Clean reservoir cover thoroughly.
2. Remove screws, cover and diaphragm (C) from reservoir.
3. Inspect vent slots (A) in cover and remove any debris or blockage.



4. If changing fluid, remove old fluid from reservoir with a Mity Vac® pump (**PN 2870975**) or similar tool.



5. Begin bleeding procedure with the caliper that is farthest from the master cylinder. Install a box end wrench on caliper bleeder screw. Attach a clean, clear hose to fitting and place the other end in a clean container. Be sure the hose fits tightly on fitting.



NOTE: Fluid may be forced from supply port (B) when brake lever is pumped. Place diaphragm (C) in reservoir to prevent spills. Do not install cover. See Illustration above.

6. Slowly pump the brake lever until pressure builds and holds.
7. While maintaining lever pressure, open bleeder screw. Close bleeder screw and release brake lever.

   NOTE: Do not release lever before bleeder screw is tight or air may be drawn into caliper.

8. Repeat procedure until clean fluid appears in bleeder hose and all air has been purged. Add fluid as necessary to maintain level in reservoir.

CAUTION

Maintain at least 1/2", (1.27 cm) of brake fluid in the reservoir to prevent air from entering the master cylinder.

9. Tighten bleeder screw securely and remove bleeder hose. Torque the bleeder screw to specification.

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Bleeder Screw:
25-30 in-lbs (2.80-3.40 Nm)

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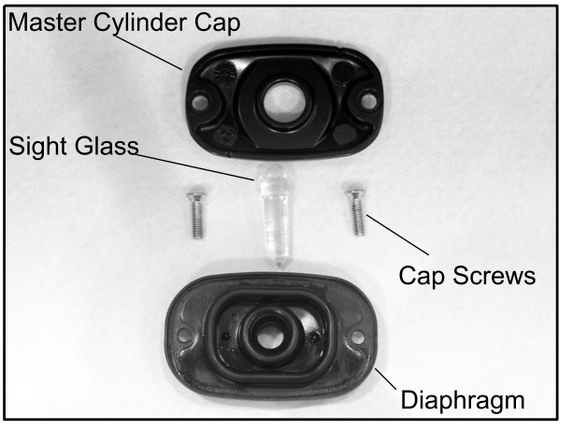
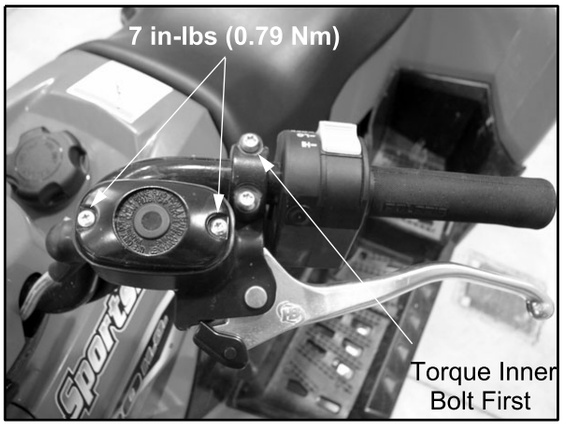
10. Repeat procedure Steps 5-9 for the remaining caliper(s).
11. Add Polaris DOT-approved Brake Fluid to MAX level inside reservoir.

12. Install diaphragm, sight glass, cap and screws.



13. Wiggle and press down on the cap to be sure it fits evenly and snug.

14. Torque the screw to specification .



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Master Cylinder Cover Screw: **7 in-lbs (0.79 Nm)**

15. Field test machine at low speed before putting into service. Check for proper braking action and lever reserve. With lever firmly applied, lever reserve should be no less than 1/2”, (1.3 cm) from handlebar.
16. Check brake system for fluid leaks and inspect all hoses and lines for wear or abrasion. Replace hose if wear or abrasion is found.

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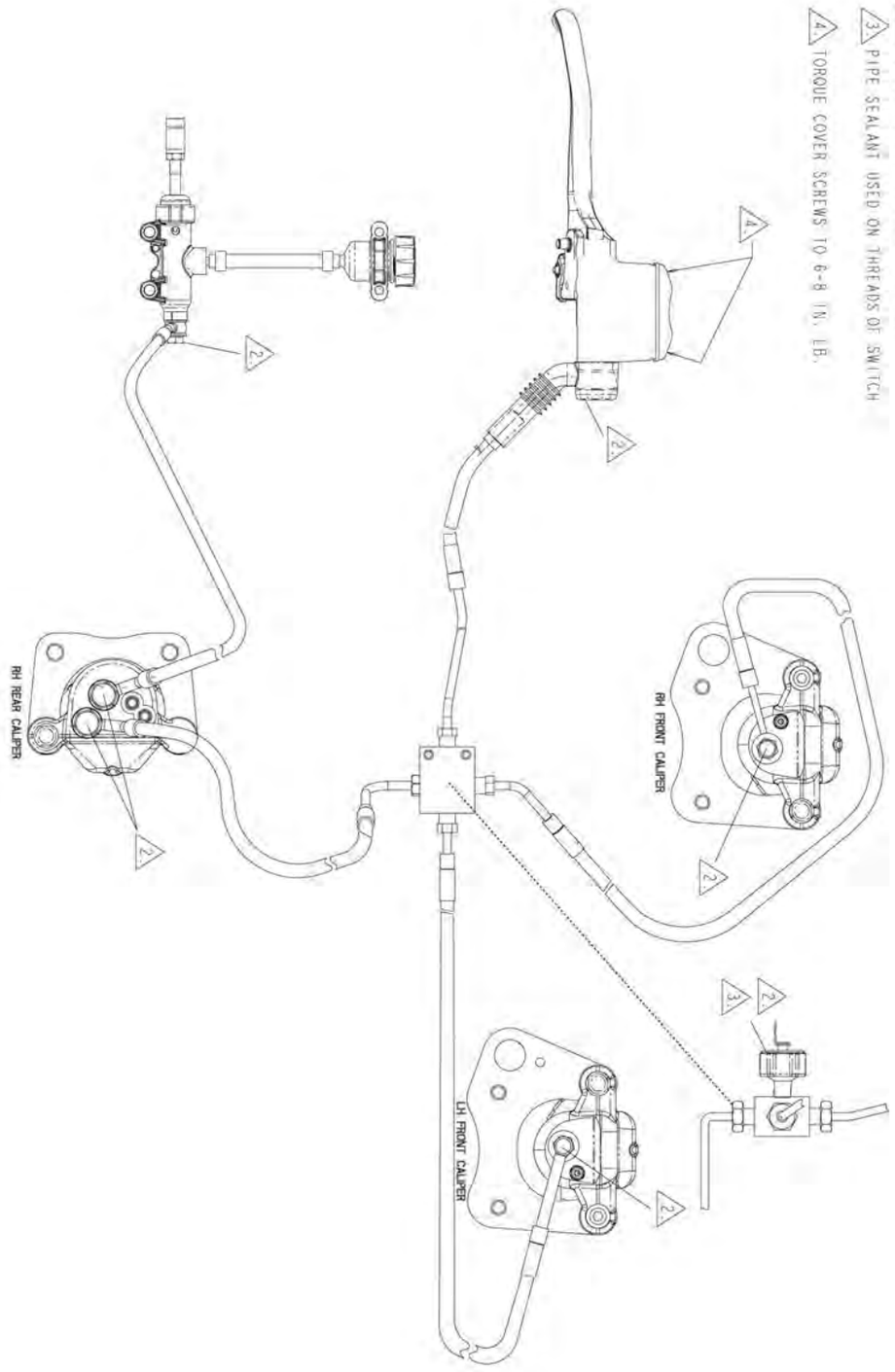
BRAKE SYSTEM EXPLODED VIEWS

Bake System Components



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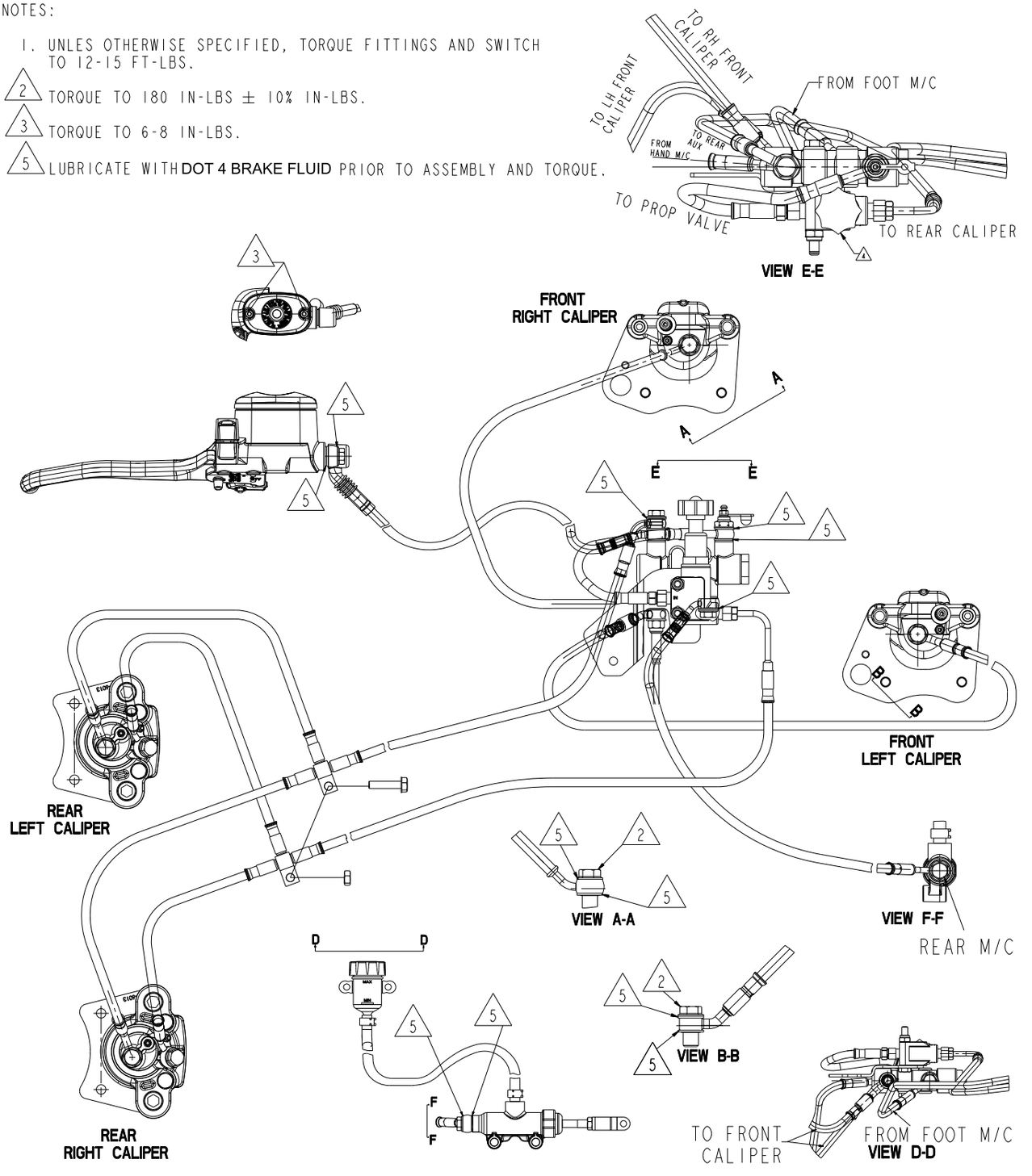
Bake System Components (Forest and Intl. Models)

NOTES:

1. UNLES OTHERWISE SPECIFIED, TORQUE FITTINGS AND SWITCH TO 12-15 FT-LBS.
2. TORQUE TO 180 IN-LBS ± 10% IN-LBS.
3. TORQUE TO 6-8 IN-LBS.
5. LUBRICATE WITH DOT 4 BRAKE FLUID PRIOR TO ASSEMBLY AND TORQUE.



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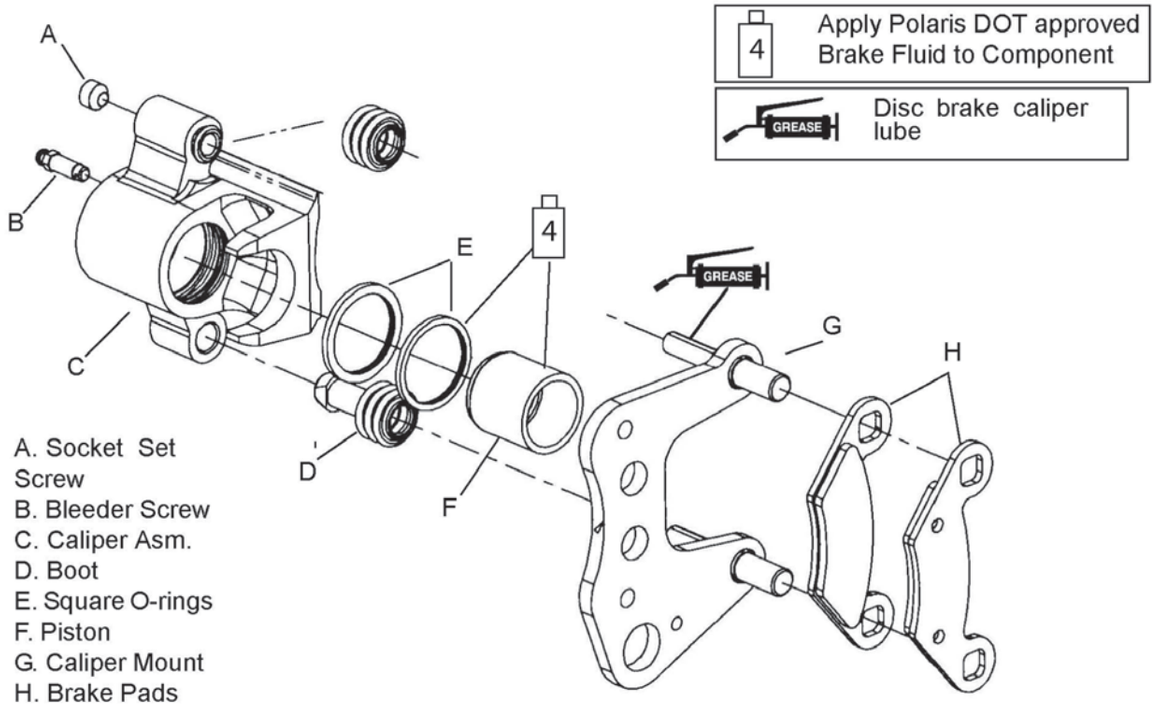
BRAKE CALIPER EXPLODED VIEWS

Front Caliper Assembly (All Models)



A. Socket Set Screw
B. Bleeder Screw
C. Caliper Asm.
D. Boot
E. Square O-rings
F. Piston
G. Caliper Mount
H. Brake Pads

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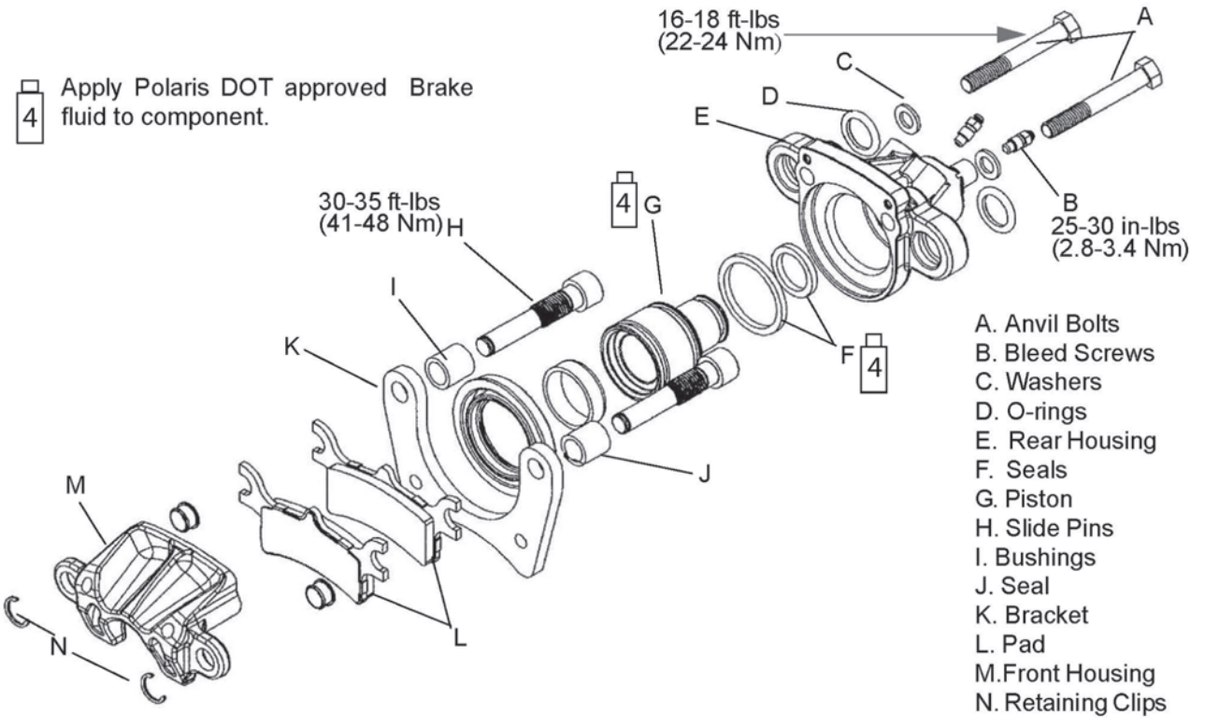
Rear Caliper Assembly (All Non Touring Models)



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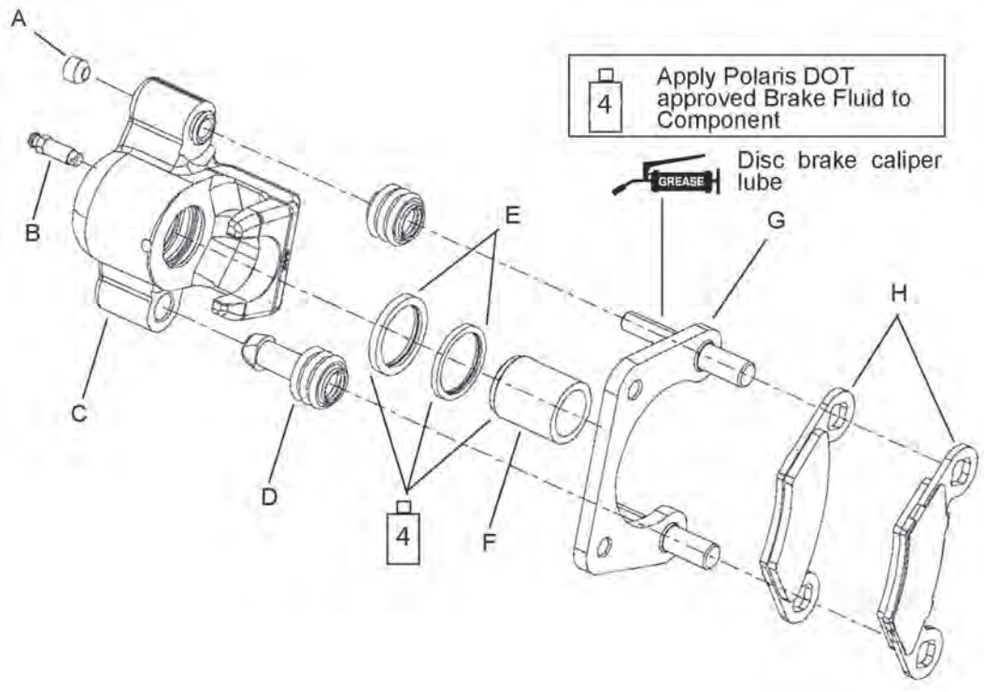
Rear Caliper Assembly (non INTL.)



A. Socket Set Screw
B. Bleeder Screw
C. Caliper Asm
D. Boot
E. Caliper Seals
F. Piston
G. Caliper Mount
H. Brake Pads

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FRONT MASTER CYLINDER (ALL MODELS)

Removal

1. Clean master cylinder and reservoir assembly. Make sure you have a clean work area to disassemble brake components.
2. Remove master cylinder from handlebars.

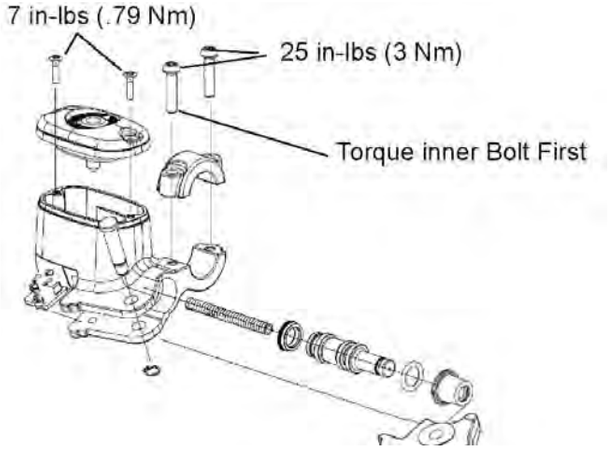
⚠ CAUTION

Brake fluid will damage finished surfaces.
Do not allow brake fluid to come in contact with finished surfaces.

3. While holding upright, continue to remove master cylinder. Cover the brake line to avoid spillage when removing the brake line banjo bolt.

Installation

1. Install master cylinder on handlebars. Torque mounting bolts to specification. Torque the inner bolt first as indicated in the illustration below.



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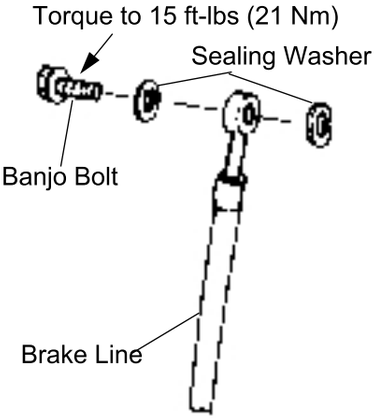
Master Cylinder Mount Bolt:
25 in-lbs (3 Nm)
Torque Inner Bolt First

2. Place new sealing washers on each side of banjo fitting on the brake line and torque banjo bolt to specification.



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Banjo Bolt:
15 ft-lbs (21 Nm)

3. Fill reservoir with DOT-approved brake fluid.

NOTE: To speed up the brake bleeding procedure, the master cylinder can be purged of air before brake line is attached. Fill with DOT-approved brake fluid and pump lever slowly two to three times with finger over the outlet end to purge master cylinder of air.

4. Follow proper bleeding procedures. Check all connections for leaks and repair if necessary.

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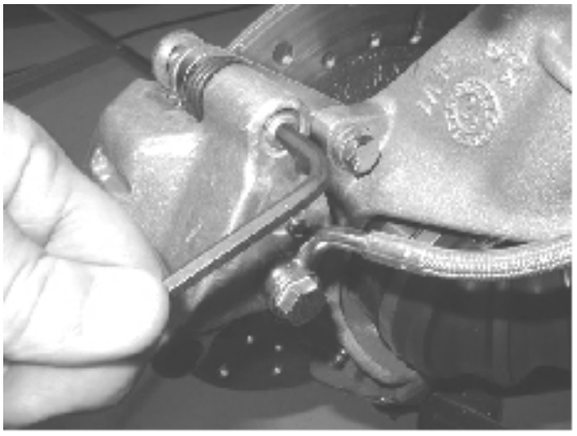
FRONT BRAKES

Pad Removal

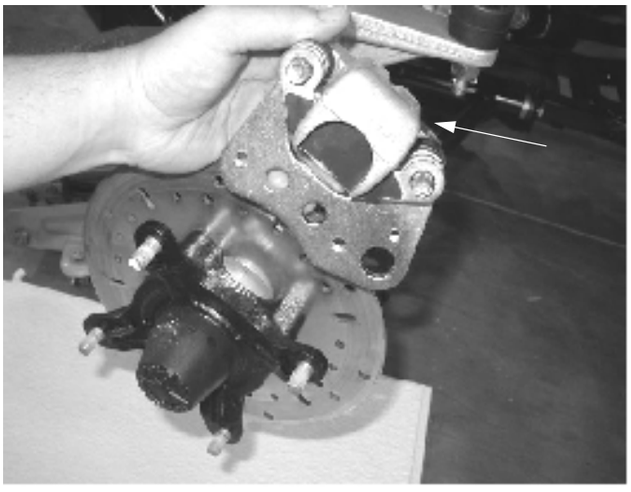
1. Elevate and support the of the ATV.

CAUTION
Use care when supporting vehicle so that it does not tip or fall. Severe injury may occur.

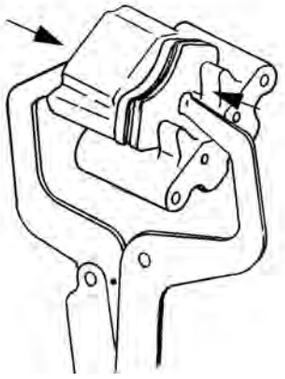
2. Remove the wheel.
3. Loosen pad adjuster screw 2-3 turns.



4. Remove caliper from mounting bracket.

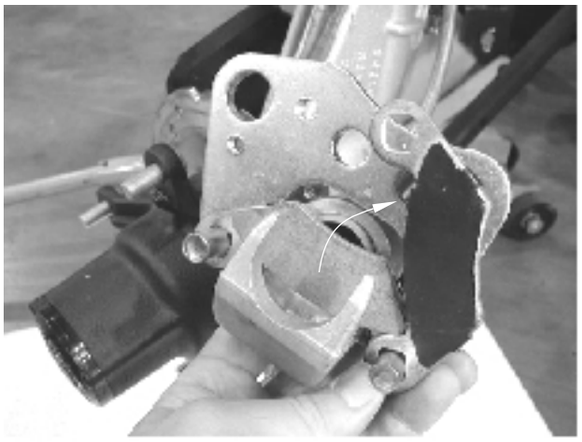


5. Push caliper piston into caliper bore slowly using a C-clamp or locking pliers with pads installed.



NOTE: Brake fluid will be forced through compensating port into master cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

6. Push mounting bracket inward and slip outer brake pad past edge. Remove inner pad.



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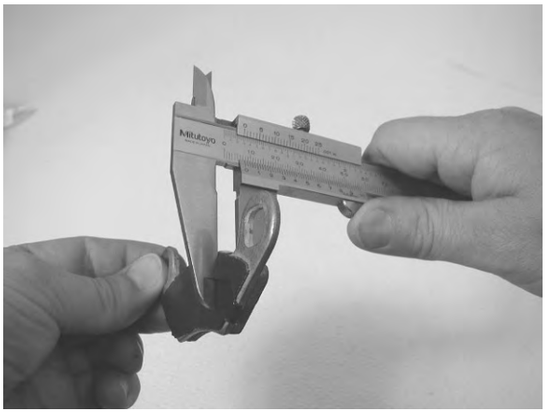
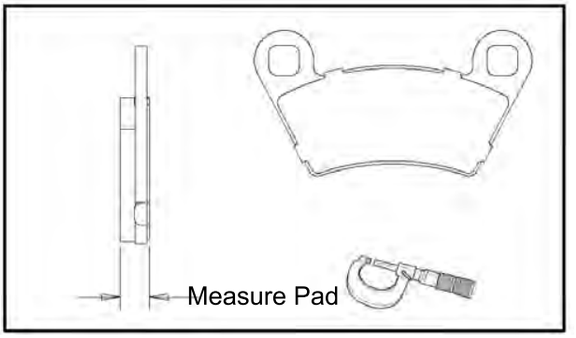
7. Measure the thickness of the pad material. Replace pads if worn beyond the service limit.



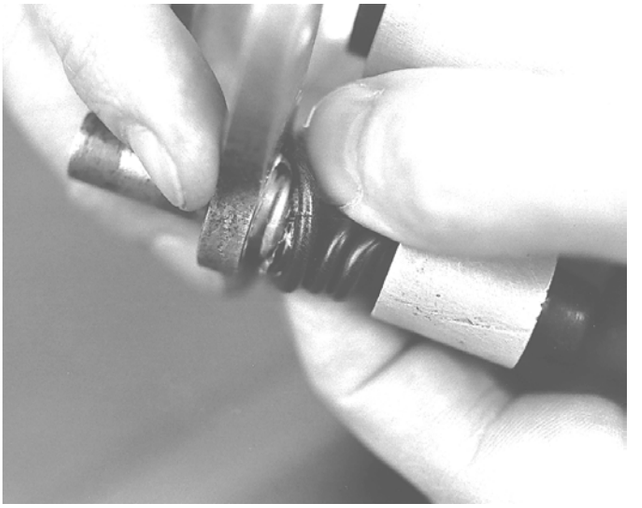


= In. / mm.

Front Brake Pad Thickness Service Limit:
.180” / 4.6 mm

Assembly

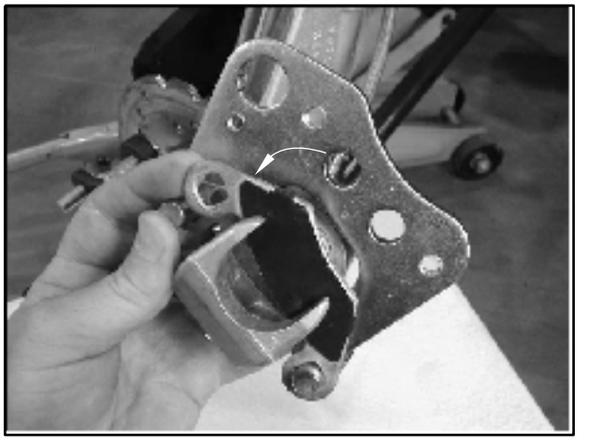
1. Lubricate mounting bracket pins with a light film of disc brake caliper lube, and install rubber dust boots.



2. Compress mounting bracket and make sure dust boots are fully seated. Install pads with friction material facing each other.

WARNING

If pads are contaminated with grease, oil, or liquid soaked do not use the pads. Use only new clean pads.



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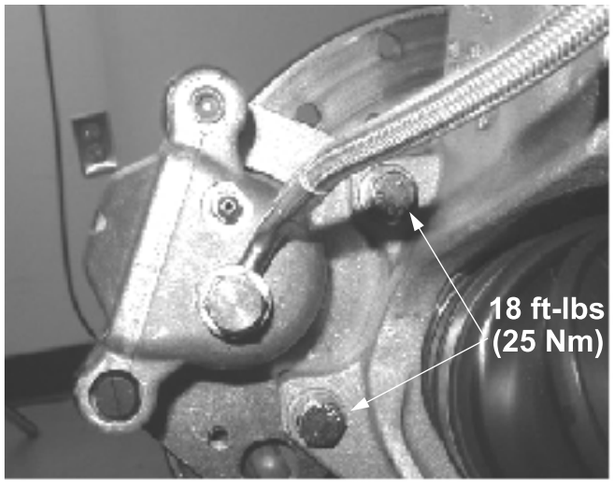
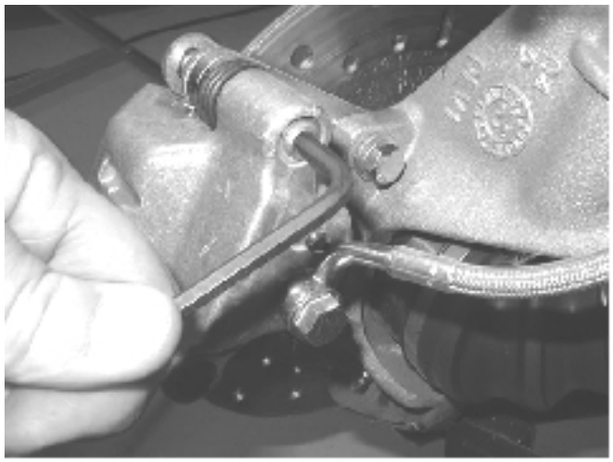
3. Install caliper on hub strut, and torque mounting bolts.



4. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2, (12.7 mm) of brake fluid in the reservoir to prevent air from entering the brake system.
5. Install the adjuster screw and turn clockwise until stationary pad contacts disc, then back off 1/2 turn (counterclockwise).



6. Verify fluid level in reservoir is up to MAX line inside reservoir and install reservoir cap.
7. Install wheels and torque wheel nuts. It is required that a burnishing procedure be performed after installation of new brake pads to extend service life and reduce noise.

   NOTE: Front Wheel Nut Torque: Refer to Chapter 2.

Brake Burnishing Procedure

Start machine and slowly increase speed to 30 mph. Gradually apply brakes to stop machine. Allow pads and disc to cool sufficiently during the procedure. Do not allow pads or disc to become hot or warping may result. Repeat this procedure 10 times.

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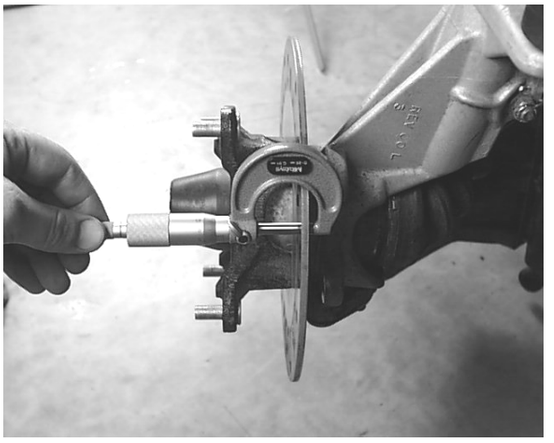
FRONT BRAKE DISC

Inspection

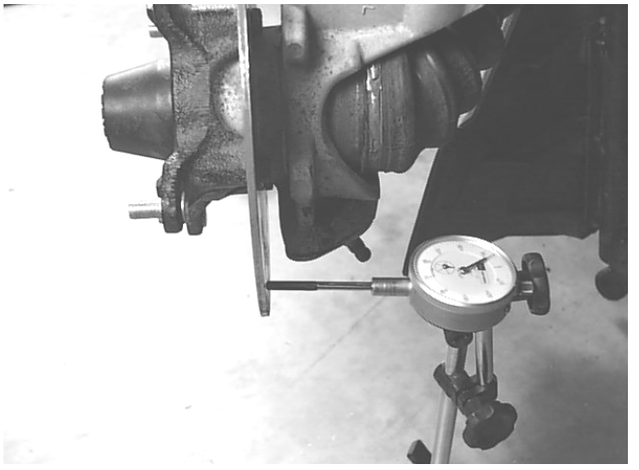
1. Visually inspect the brake disc for nicks, scratches, or damage.
2. Measure the disc thickness at eight different points around the pad contact surface. Replace disc if worn beyond service limit.



= In. / mm.
Brake Disc Thickness: **Service Limit: .140” / 3.556 mm**

= In. / mm.
Brake Disc Thickness Variance Service Limit: **.002” (.051 mm)** between measurements.

3. Mount dial indicator as shown to measure disc runout. Slowly rotate the disc and read total runout on the dial indicator. Replace the disc if runout exceeds specifications.



= In. / mm.
Brake Disc Runout Service Limit: **.010” / .254 mm**

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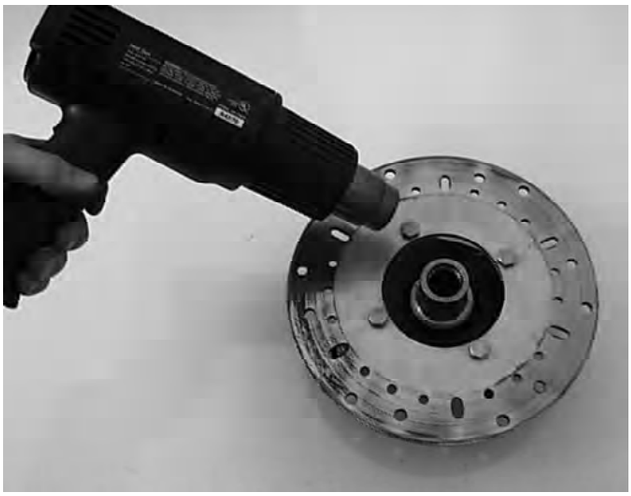
Removal / Replacement

NOTE: To reduce the possibility of warping, try removing the brake disc mounting bolts before applying heat to the bolts.

1. Apply heat to the hub in the area of the brake disc mounting bolts to soften the bolt locking agent.



2. Remove bolts and disc.
3. Clean mating surface of disc and hub.
4. Install disc on hub.
5. Install new bolts and tighten to specification.

= T
Brake Disc Bolt: **Front - 18 ft-lbs (24 Nm)** **Rear - 27 ft-lbs (37 Nm)**

CAUTION
Always use new brake disc mounting bolts. The bolts have a pre-applied locking agent which is destroyed upon removal.

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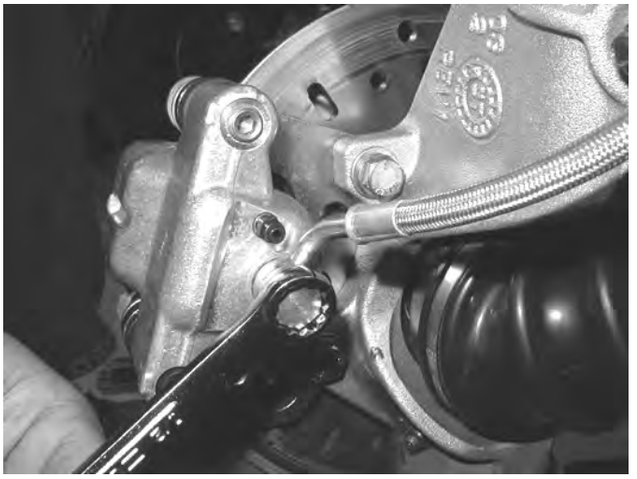
FRONT CALIPER

Removal

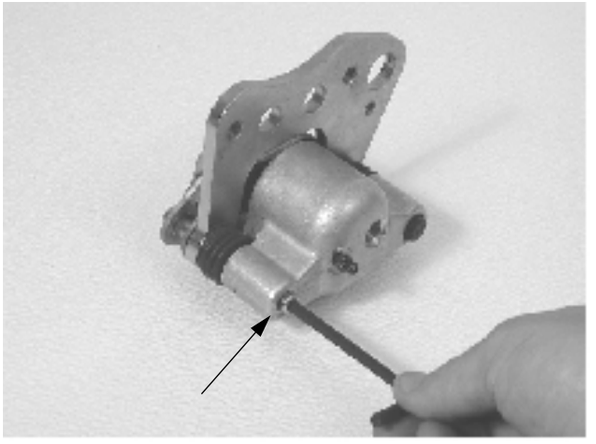
⚠ WARNING

Use care when supporting vehicle so that it does not tip or fall. Severe injury may occur.

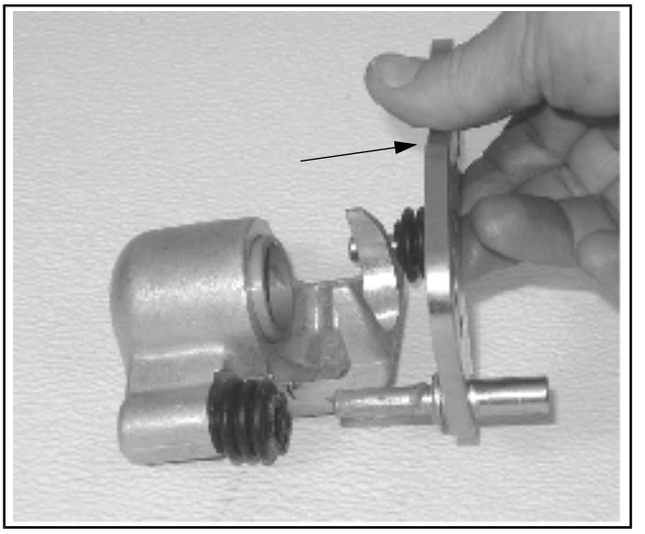
1. Loosen and remove brake line to caliper. Place a container under caliper to catch fluid draining from brake line.



2. Push upper pad retainer pin inward and slip brake pads past edge. Loosen pad adjuster.

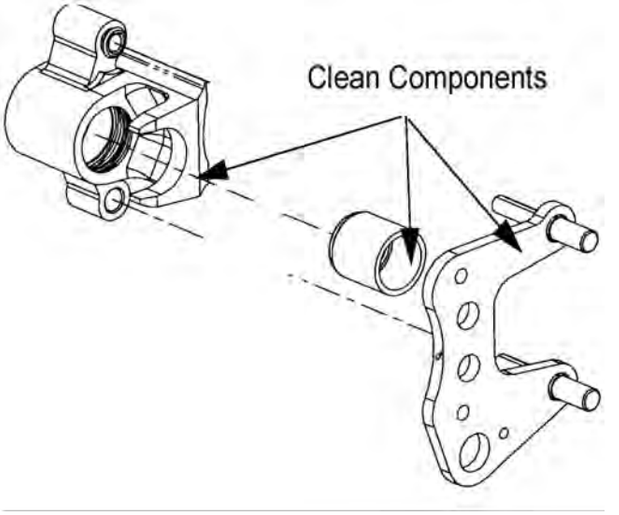


3. Remove mounting bracket, pin assembly and dust boot.



4. Remove piston, dust seals and piston seals.
5. Clean the caliper body, piston, and retaining bracket with brake cleaner or alcohol.

   NOTE: Be sure to clean seal grooves in caliper body.



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Inspection

1. Inspect caliper body for nicks, scratches or wear. Measure bore size and compare to specifications. Replace if damage is evident or if worn beyond service limit.

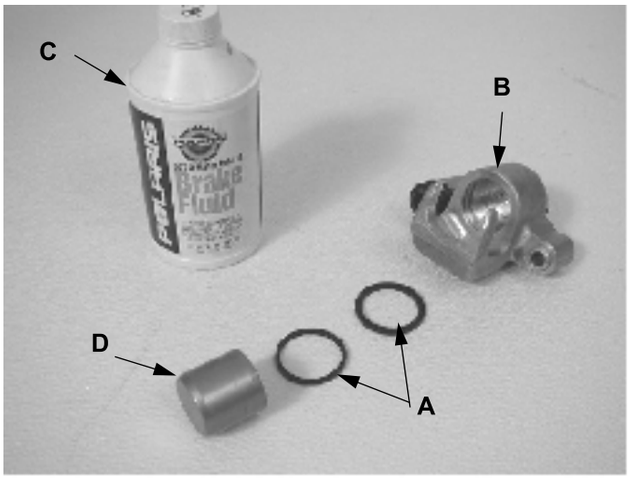
= In. / mm.
Front Caliper Piston Bore I.D.: Service Limit: 1.193” (30.30 mm)

2. Inspect piston for nicks, scratches, wear or damage. Measure diameter and replace if damaged or worn beyond service limit.

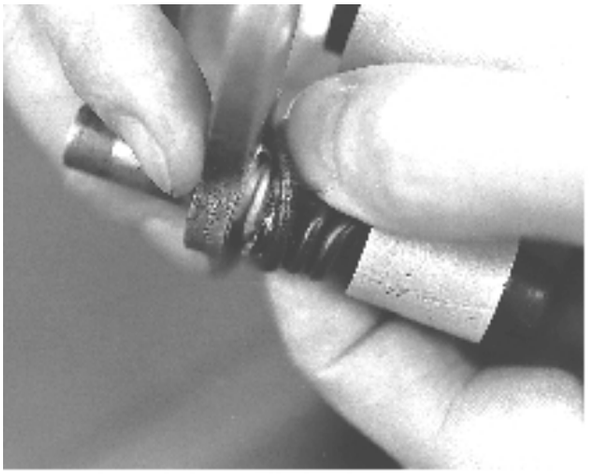
3. Inspect the brake disc and pads as outlined for brake pad replacement in this section. See “BRAKE PAD INSPECTION” earlier in this chapter.

Reassembly

1. Install new caliper seals (A) in the caliper body (B). Be sure groove is clean and free of residue or brakes may drag upon assembly.



2. Coat piston with clean Polaris DOT-approved Brake Fluid (C). Install piston (D) with a twisting motion while pushing inward. Piston should slide in and out of bore smoothly, with light resistance.
3. Lubricate the mounting bracket pins with disc brake caliper lube, and install the rubber dust seal boots.



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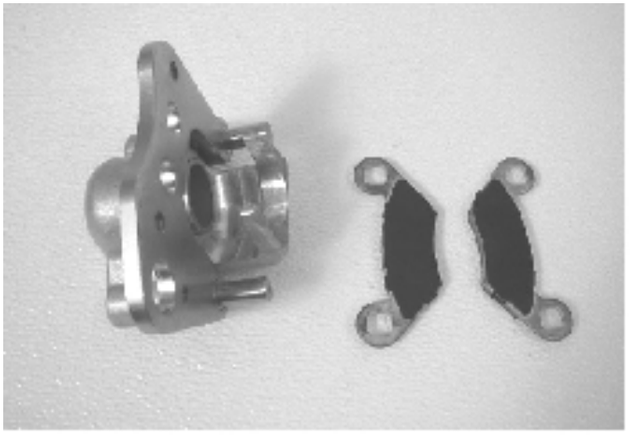
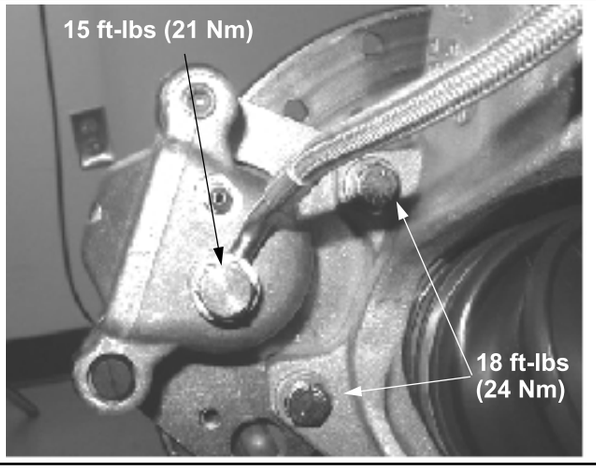
4. Compress the mounting bracket and make sure the dust seals are fully seated. Install the brake pads. Clean the disc and pads with brake parts cleaner or denatured alcohol to remove any dirt, oil or grease.



Installation

1. Install caliper on hub strut, and torque mounting bolts to specification.

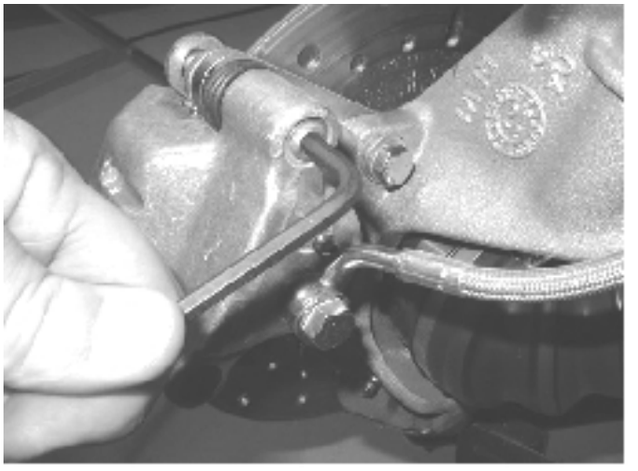


= T
Brake Caliper Mounting Bolt: **18 ft-lbs (24 Nm)**

2. Install brake line and torque the banjo bolt to specification.

= T
Brake Line Banjo Bolt: **15 ft-lbs (21 Nm)**

3. Install the adjuster screw and turn until stationary pad contacts disc, then back off 1/2 turn.



4. Perform brake bleeding procedure as outlined earlier in this chapter.
5. Install wheels and torque wheel nuts to specification. Refer to Chapter 2.

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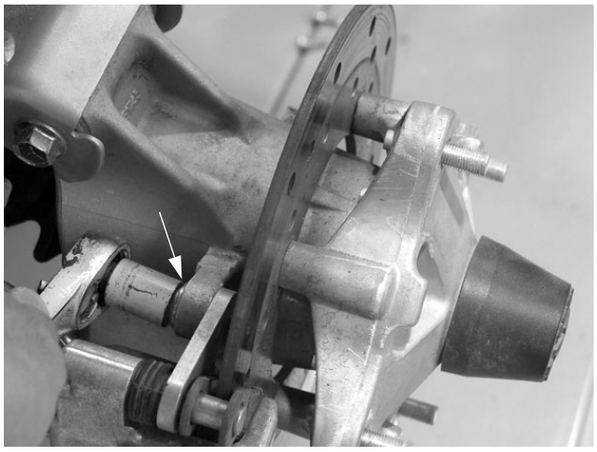
REAR BRAKE PAD

Touring Pad Removal

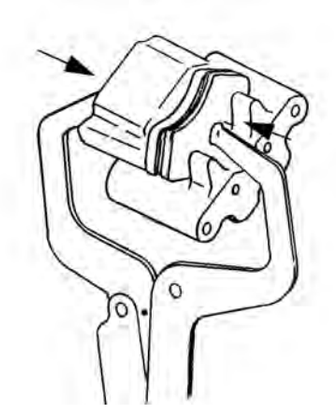
1. Elevate and support the rear of the ATV.
2. Remove the rear wheel
3. Loosen pad adjuster screw 2-3 turns.

4. Remove the two caliper mounting bolts and lift caliper off the brake disc.



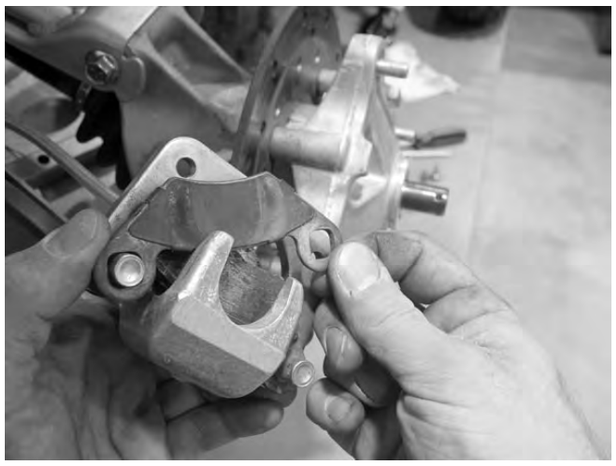
NOTE: When removing caliper, be careful not to damage brake line. Support caliper so as not to kink or bend brake line.

5. Push caliper piston into the caliper bore slowly using a C-clamp or locking pliers with pads installed.



NOTE: Brake fluid will be forced through compensating port into master cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

6. Push caliper mounting bracket inward and slip outer brake pad past the edge to remove.



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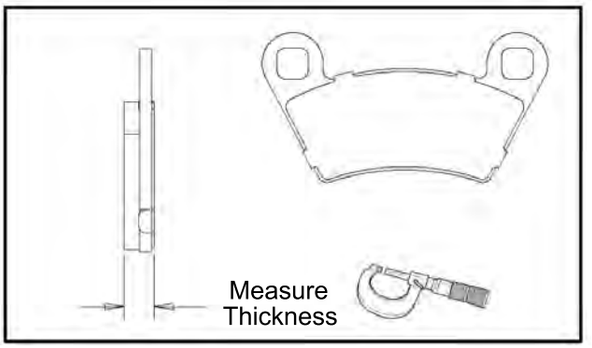
7. Remove the inner brake pad.

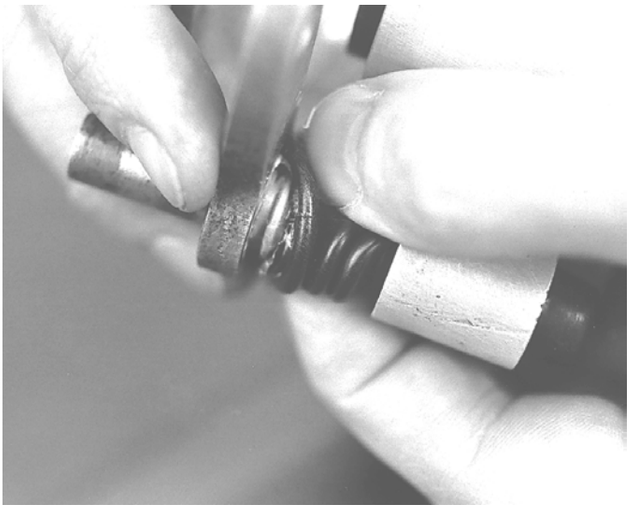
8. Clean the caliper with brake cleaner or alcohol.
9. Measure the thickness of the pad material. Replace pads if worn beyond the service limit.



= In. / mm.
Rear Brake Pad Thickness **Service Limit: .180" (4.6 mm)**

Touring Pad Installation

1. Lubricate mounting bracket pins with a light film of disc brake caliper lube, and install rubber dust boots.



2. Compress mounting bracket and make sure dust boots are fully seated. Install pads with friction material facing each other.

WARNING
If brake pads are contaminated with grease, oil, or liquid soaked do not use the pads. Use only new clean pads.

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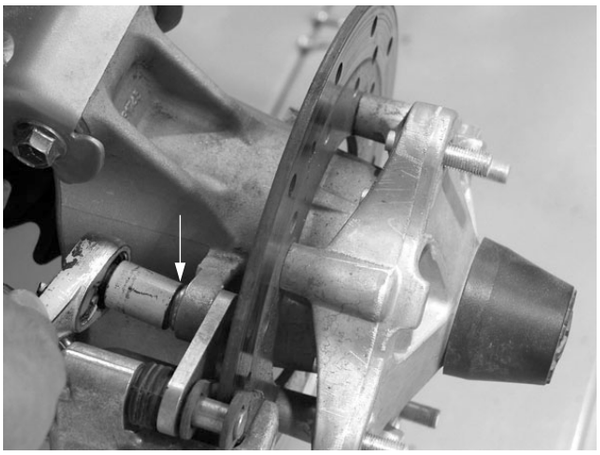
3. Install caliper and torque the mounting bolts to specification.



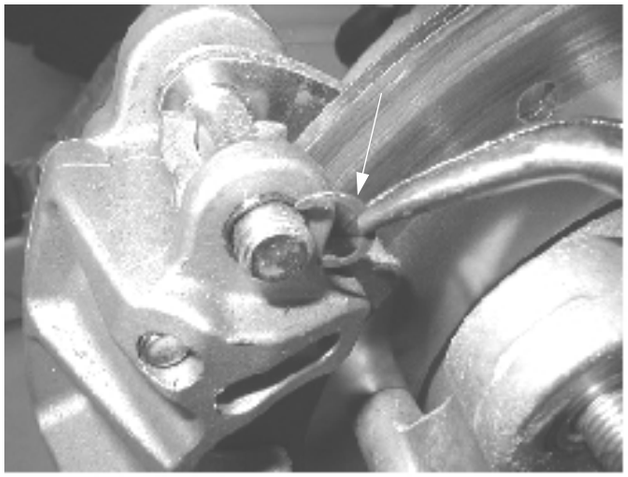
= T
Caliper Mount Bolt: **18 ft-lbs (24 Nm)**

4. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2, (12.7 mm) of brake fluid in the reservoir to prevent air from entering the brake system.
5. Install the adjuster screw and turn clockwise until the stationary pad contacts the disc, then back off 1/2 turn (counterclockwise).

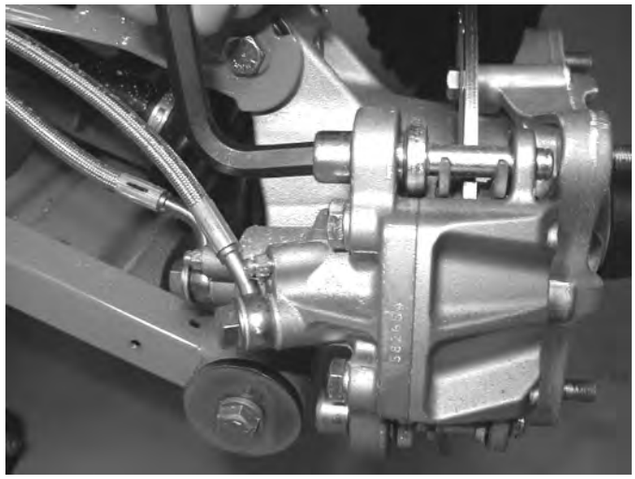
6. Verify fluid level in reservoir is up to the MAX line inside reservoir and install reservoir cap.
7. Install wheel(s) and torque wheel nut(s).
8. It is recommended that a burnishing procedure be performed after installation of new brake pads to extend service life and reduce noise.

Sportsman Rear Pad Removal

1. Support the machine. Remove the rear tire.
2. Remove the slide pin clips from the slide bolt.



3. Loosen the slide pins with a hex wrench.



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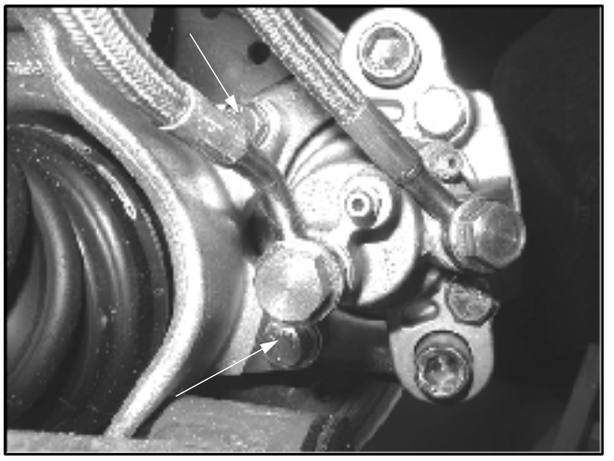
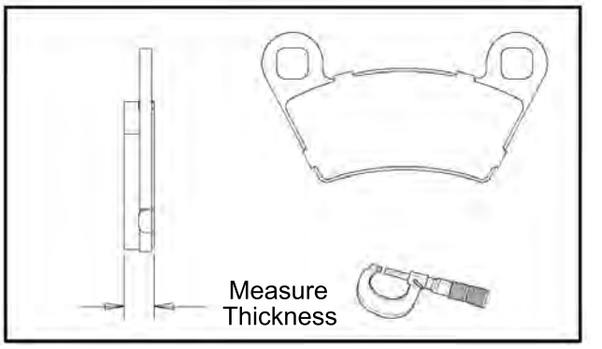
4. Remove caliper mounting bolts and lift caliper off of disc.



NOTE: When removing caliper, be careful not to damage brake line. Support caliper so as not to kink or bend brake line.

5. Push caliper pistons into caliper bore slowly with pads installed.
6. Remove the caliper slide pins and remove the brake pads from the caliper.

7. Clean the caliper with brake cleaner or alcohol.
8. Measure the thickness of the pad material. Replace pads if worn beyond the service limit.



= In. / mm.

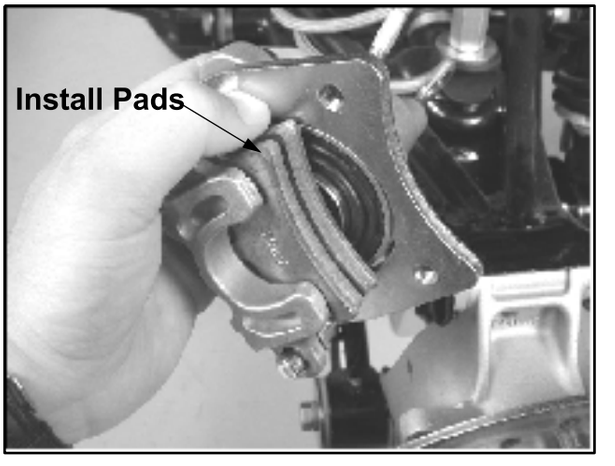
Rear Brake Pad Thickness
Service Limit: .180” (4.6 mm)

Sportsman Rear Pad Installation

1. Install new brake pads in caliper body.

WARNING

If the brake pads are contaminated with grease, oil, or liquid soaked do not use the pads, use only new clean pads.



2. Install and tighten the slide pin with a hex wrench.

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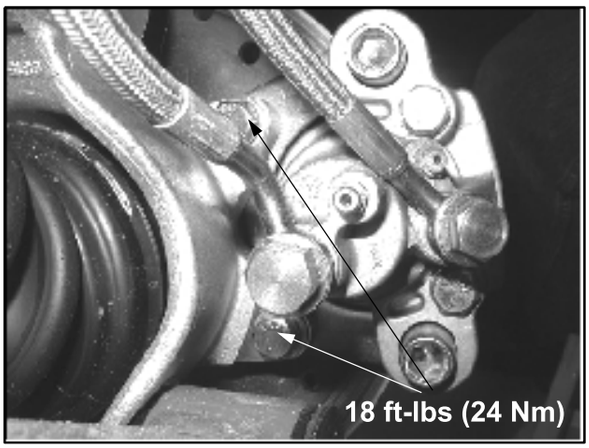
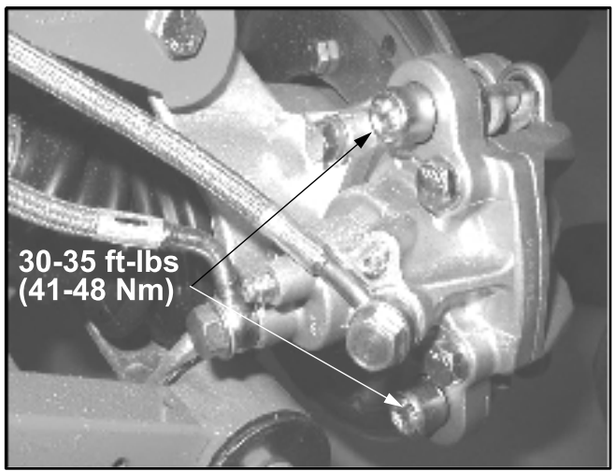
3. Install caliper and torque the mounting bolts to specification.

= T
Caliper Mount Bolt: **18 ft-lbs (24 Nm)**



4. Install the slide bolt snap ring. Torque the slide pin to specification.



= T
Caliper Slide Bolt: **30-35 ft-lbs (41-48Nm)**

5. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2, (12.7 mm) of brake fluid in the reservoir to prevent air from entering the master cylinder.
6. It is recommended that a burnishing procedure be performed after installation of new brake pads to extend service life and reduce noise.

Brake Burnishing Procedure

Start machine and slowly increase speed to 30 mph. Gradually apply brakes to stop machine. Allow pads and disc to cool sufficiently during the procedure. Do not allow pads or disc to become hot or warping may result. Repeat this procedure 10 times.

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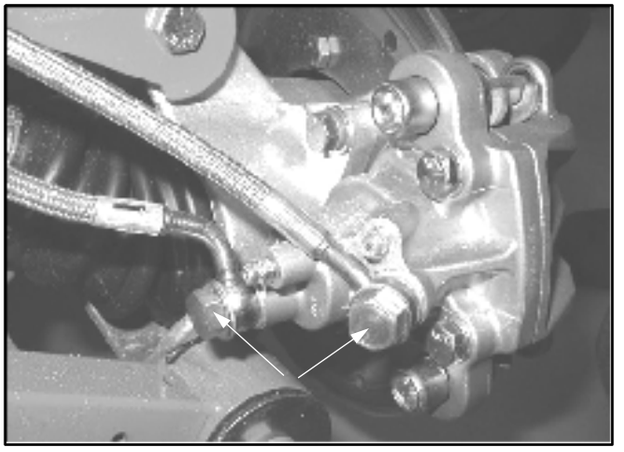
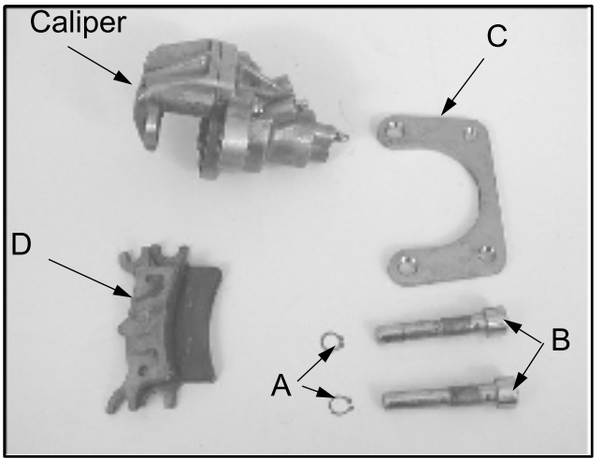
SPORTSMAN REAR CALIPER

Removal and Inspection

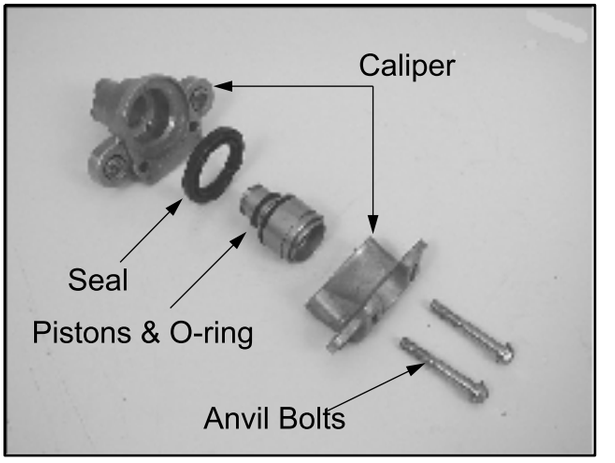
1. Clean caliper area before removal.
2. Using a flare nut wrench, remove hand brake (inner) and auxiliary brake (outer) lines (arrows). Place a container to catch brake fluid draining from brake lines.



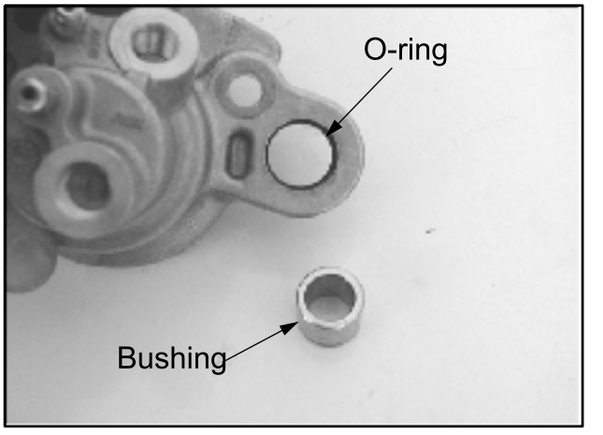
3. Remove the two caliper mounting bolts and the caliper.
4. Remove the slide bolt snap rings (A), the slide pins (B), the bracket pad (C), and the brake pads (D).



5. Remove the anvil bolts and separate caliper halves and remove pistons with piston pliers.



6. Remove seals and O-rings. Clean the O-ring grooves.
7. Clean disc, caliper body, and pistons with brake cleaner or alcohol.
8. Remove the slide bolt bushings. Inspect the bushings and O-rings and replace if necessary.



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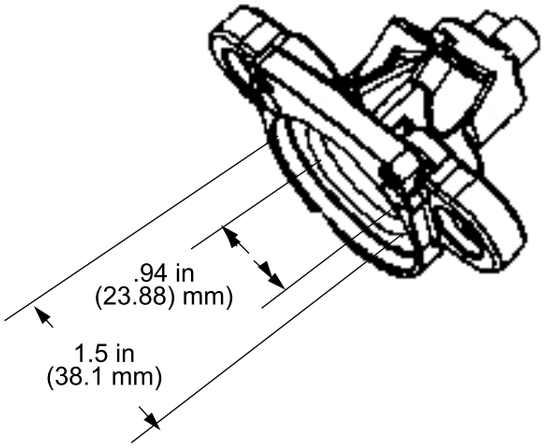
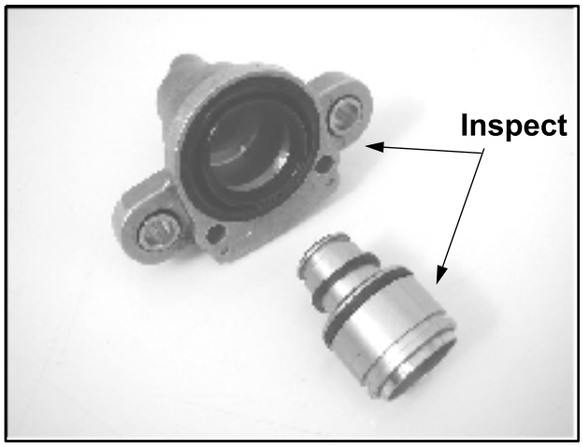
9. Measure the inside diameter of the rear caliper. The caliper body is a 2-step piston. The rear step is measured as well as the outside step.



= In. / mm.
Rear Caliper Piston Bore I.D. **Inner Bore Service Limit: .94" (23.88 mm)** **Outer Bore Service Limit: 1.5" (38.1 mm)**

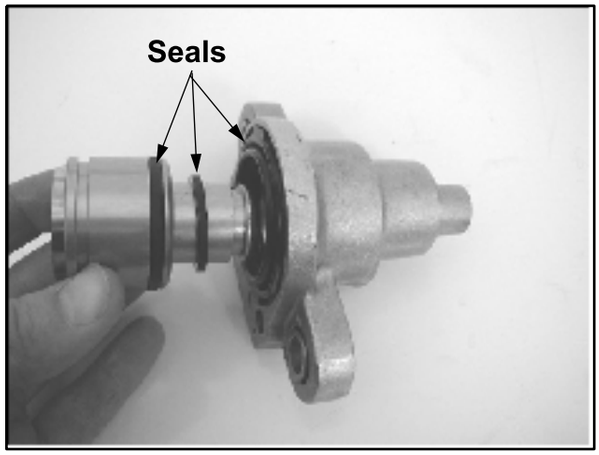
10. Inspect caliper piston bore for scratches, severe corrosion, or galling and replace if necessary.



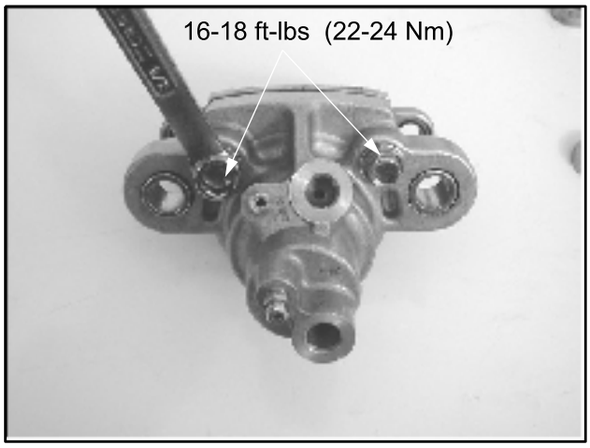
11. Inspect surface of caliper piston for nicks, scratches, or damage and replace if necessary.

Assembly

1. Install new O-rings in the slide bolt bushing holes. Be sure O-ring and seal grooves are thoroughly cleaned of all residue, or piston may bind in bore. Apply brake fluid to piston seals and install carefully with a twisting motion to ease assembly until fully seated.



2. Carefully assemble caliper body, making sure O-rings are properly positioned in groove. Tighten the caliper anvil bolts and then torque the anvil bolts evenly to specification.



= T
Caliper Anvil Bolt: **16-18 ft-lbs (22-24 Nm)**

9

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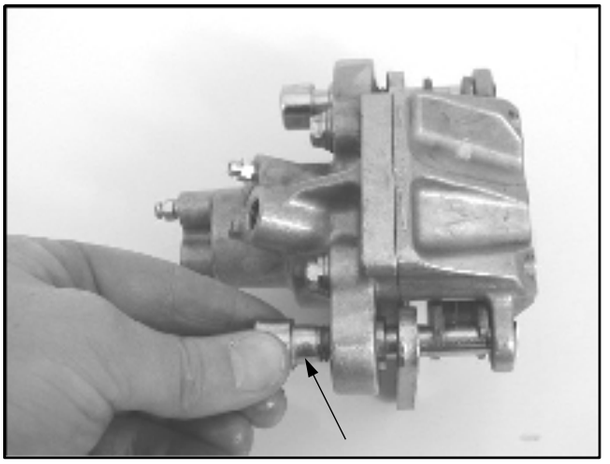
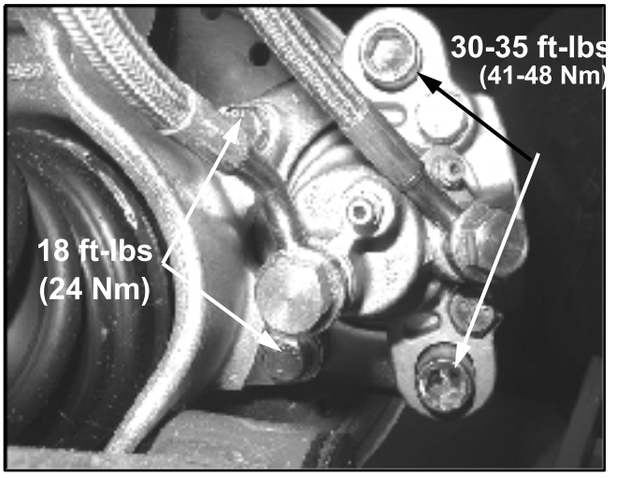
3. Install brake pads in caliper body with friction material facing each other. Install the slide pins and the slide pin retaining rings. Torque the slide pins to specification.

   NOTE: The slide pins should be torqued when installed on caliper mount.



= T
Slide Pin: **30-35 ft-lbs (41-48 Nm)**

4. Install caliper and torque mounting bolts to specification.



= T
Caliper Mounting Bolt: **16-18 ft-lbs (22-24 Nm)**

5. Install brake line and tighten securely with a line wrench. Torque the brake lines to the proper torque specification.
6. Follow bleeding procedure outlined in the “BLEEDING PROCEDURE” in this chapter.
7. Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, re-check assembly and installation.

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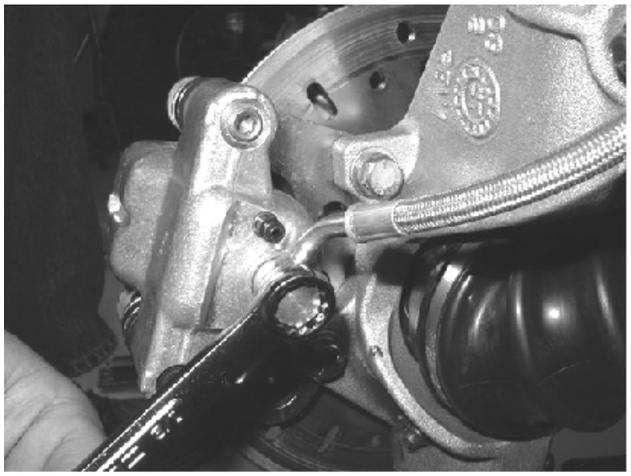
SPORTSMAN TOURING REAR CALIPER

Removal

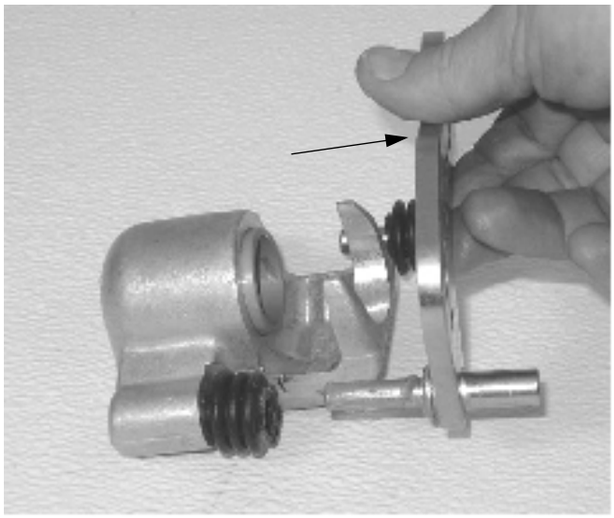
WARNING

Use care when supporting vehicle so that it does not tip or fall. Severe injury may occur.

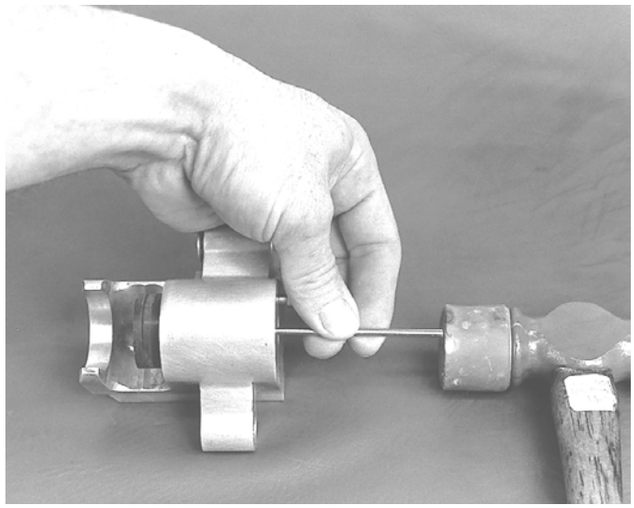
1. Clean caliper area before removal.
2. Place a container below the caliper to catch brake fluid that will drain from the brake line. Remove brake line from caliper



3. Remove the two caliper mounting bolts and the caliper.
4. Loosen the adjuster screw and remove the brake pads.
5. Remove mounting bracket, pin assembly and dust boot.



6. Remove piston, dust seals and piston seals.



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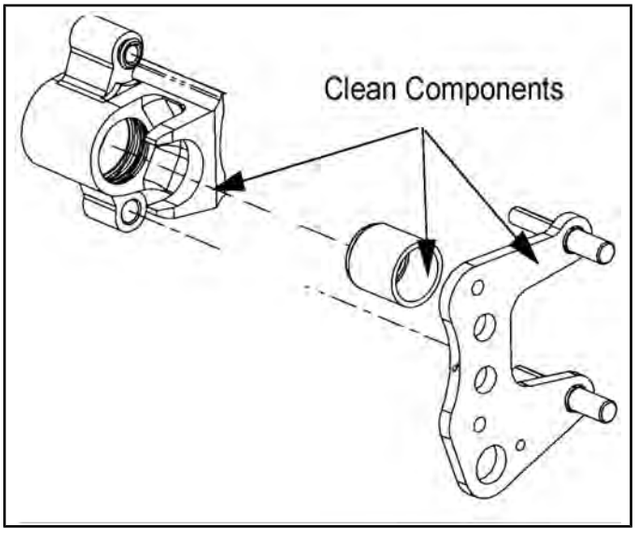
7. Clean the caliper body, piston, and retaining bracket with brake cleaner or alcohol.

   NOTE: Be sure to clean seal grooves in caliper body.



Inspection

1. Inspect caliper body for nicks, scratches or wear. Measure bore size and compare to specifications. Replace if damage is evident or if worn beyond service limit.

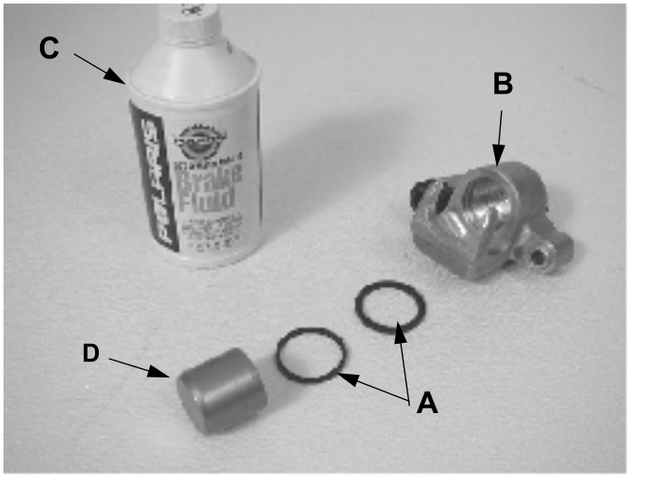
= In. / mm.
Rear Caliper Piston Bore I.D. **Service Limit: 1.193" (30.30 mm)**

2. Inspect piston for nicks, scratches, wear or damage. Measure diameter and replace if damaged or worn beyond service limit.

3. Inspect the brake disc and pads as outlined for brake pad replacement in this section. See "BRAKE PAD INSPECTION" earlier in this chapter.

Reassembly

1. Install new caliper seals (A) in the caliper body (B). Be sure groove is clean and free of residue or brakes may drag upon assembly.



2. Coat piston with clean Polaris DOT-**approved** Brake Fluid (C). Install piston (D) with a twisting motion while pushing inward. Piston should slide in and out of bore smoothly, with light resistance.

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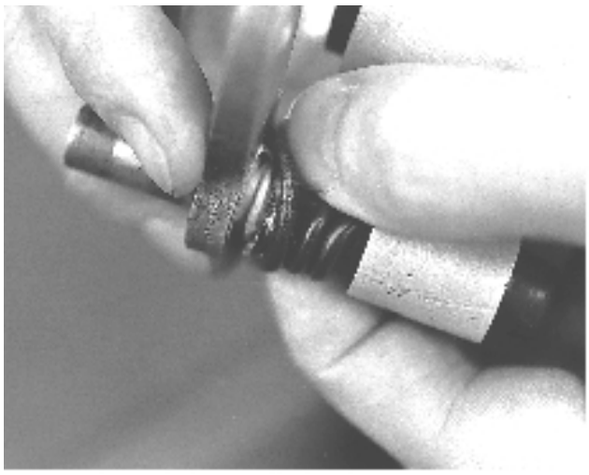
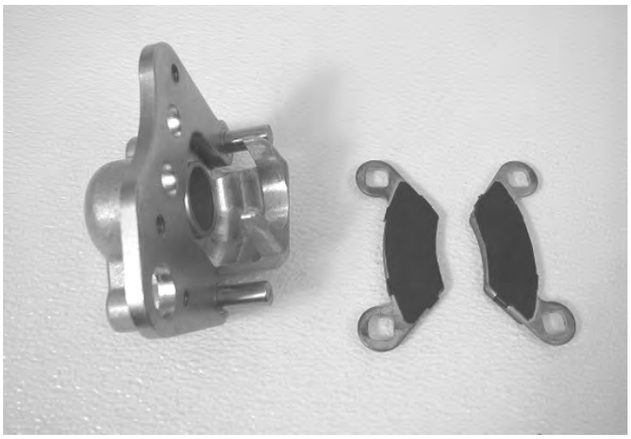
3. Lubricate the mounting bracket pins with disc brake caliper lube, and install the rubber dust seal boots.



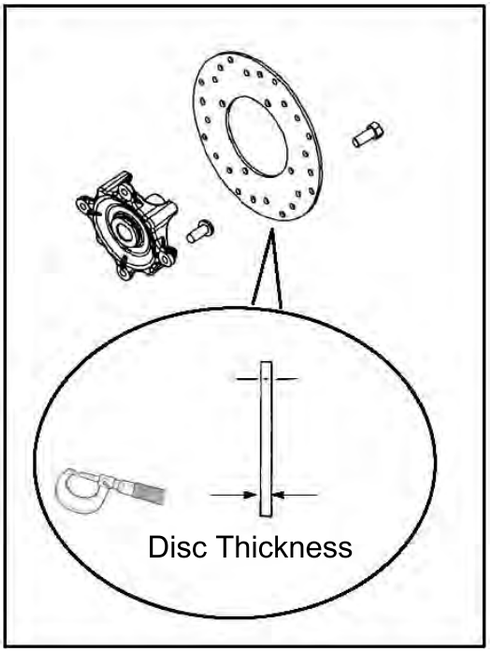
4. Compress the mounting bracket and make sure the dust seals are fully seated. Install the brake pads. Clean the disc and pads with brake parts cleaner or denatured alcohol to remove any dirt, oil or grease.



REAR BRAKE DISC

Inspection

1. Visually inspect disc for scoring, scratches, or gouges. Replace the disc if any deep scratches are evident.
2. Use a micrometer and measure disc thickness at 8 different points around perimeter of disc. Replace disc if worn beyond service limit.



= In. / mm.
Brake Disc Thickness: **Service Limit : .170" (4.318 mm)** Brake Disc Thickness Variance: **Service Limit: .002" (.051 mm)** Between Measurements

3. Mount dial indicator and measure disc runout. Replace the disc if runout exceeds specifications.

= In. / mm.
Brake Disc Runout **Service Limit: .010" / .254 mm**

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REAR MASTER CYLINDER

Overview

Polaris disc brake systems are light weight, low maintenance and perform well in the conditions ATVs routinely encounter. However, there are a few things to remember when replacing disc brake pads or performing brake system service to ensure proper system function and maximum pad service life.

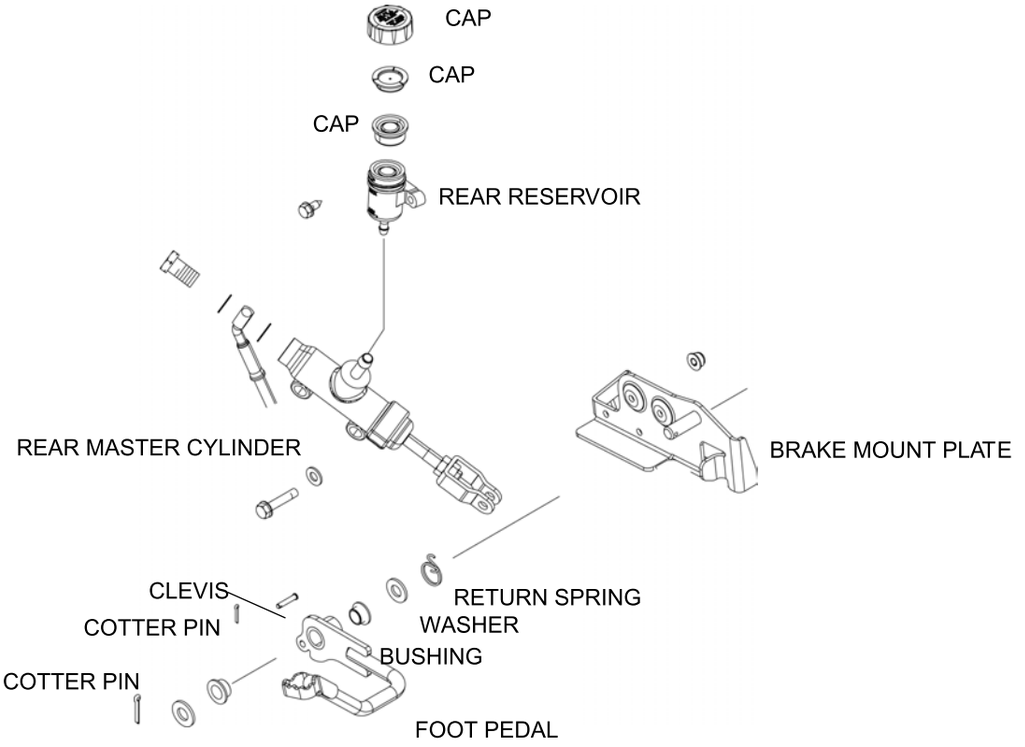
- Perform a brake burnishing procedure after installing new pads to maximize service life.
- Optional pads are available to suit conditions in your area. Select a pad to fit riding style and environment.
- Do not over-fill the master cylinder fluid reservoir.
- Make sure the brake lever and pedal returns freely and completely.
- Adjust stop pin on caliper (if applicable) after pad service.
- Check and adjust master cylinder reservoir fluid level after pad service.
- Make sure atmospheric vent on reservoir is unobstructed.
- Test for brake drag after any brake system service and investigate cause if brake drag is evident.
- Make sure caliper moves freely on guide pins (where applicable).
- Inspect caliper piston seals for foreign material that could prevent caliper pistons from returning freely.

CAUTION

Use only DOT-approved brake fluid as an assembly aid for all procedures described in this chapter to prevent brake system contamination.

DO NOT USE LUBRICANTS OF ANY KIND FOR ASSEMBLY, AS THEIR USE CAN CAUSE RUBBER COMPONENTS TO SWELL.

Rear Master Cylinder Exploded View (All Models)



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Rear Master Cylinder Removal / Installation

1. Remove the RH footwell to gain access to the rear master cylinder.
2. Remove the rear brake lines from the master cylinder. Use a suitable container to catch the brake fluid. Dispose of brake fluid properly.
3. Remove the two bolts that secure the rear master cylinder to the brake mount plate. Replace parts as needed.
4. To install the rear brake master cylinder, mount the master cylinder to the mount plate and torque bolts to specification.

= T
Master Cylinder to Frame Bolt: **8 ft-lbs (11 Nm)**

5. Reinstall the brake line and torque the banjo bolt to specification depending on the style of fitting.

= T
Banjo Bolt: **15 ft-lbs (21 Nm)**

= T
Flare Stye Brake Line: **12-15 ft-lbs (16-20 Nm)**

6. Perform brake bleeding procedures as outlined in this chapter.

Pedal Removal and Installation

1. Remove the RH footwell to gain access to the rear master cylinder.
2. Remove the cotter key.
3. Remove the washers, bushings, and tension spring.
4. Reverse the steps for installation, use a new cotter key during installation.

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TROUBLESHOOTING

Brakes Squeal

- Dirty/contaminated friction pads
- Improper alignment
- Worn disc
- Worn disc splines

Poor Brake Performance

- Air in system
- Water in system (brake fluid contaminated)
- Caliper/disc misaligned
- Caliper dirty or damaged
- Brake line damaged or lining ruptured
- Worn disc and/or friction pads
- Incorrectly adjusted lever
- Incorrectly adjusted stationary pad
- Worn or damaged master cylinder or components
- Improper clearance between lever and switch

Lever Vibration

- Disc damaged
- Disc worn (runout or thickness variance exceeds service limit)

Caliper Overheats (Brakes Drag)

- Compensating port plugged
- Pad clearance set incorrectly
- Auxiliary brake pedal incorrectly adjusted
- Brake lever or pedal binding or unable to return fully
- Parking brake left on
- Residue build up under caliper seals
- Operator riding brakes

Brakes Lock

- Alignment of caliper to disc

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CHAPTER 10
ELECTRICAL

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GENERAL INFORMATION

Special Tools

PART NUMBER	TOOL DESCRIPTION
PV-43568	Fluke 77 Digital Multimeter
2870630	Timing Light
2870836	Battery Hydrometer
2460761	Hall Sensor Probe Harness
2871745	Static Timing Light Harness
Polaris MDX-610P SPX PN: PU-50296	Battery Conductance Analyzer

Bosch Automotive Service Solutions: 1-800-328-6657 or online at http://polaris.service-solutions.com

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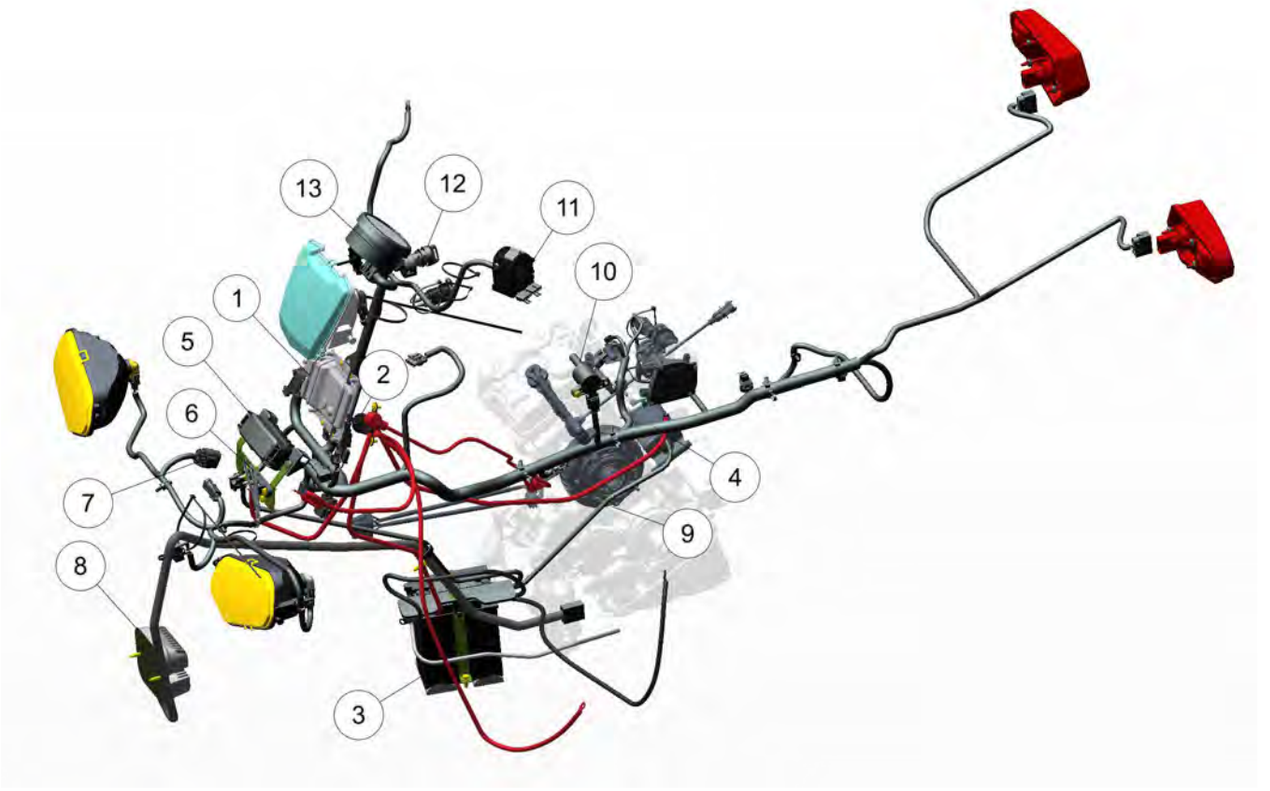
Ignition System / Basic Electrical Components



REF.	PART DESCRIPTION	NOTE
1	ECU	
2	Starter Solenoid	
3	Battery	12 volt
4	Starter	
5	Fuse Box	
6	Terminal Block	
7	Diagnostic Connector	
8	Voltage Regulator	
9	Stator	
10	Coil	
11	Left Hand Controls	
12	key Switch	
13	Instrument Cluster	

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Electrical Service Notes

Keep the following notes in mind when diagnosing an electrical problem:

- Refer to wiring diagram for stator and electrical component resistance specifications.
- When measuring resistance of a component that has a resistance value under 10 Ohms, remember to subtract meter lead resistance from the reading. Connect the leads together and record the resistance. The resistance of the component is equal to tested value minus the lead resistance.
- Become familiar with the operation of your meter. Be sure leads are in the proper jack for the test being performed (i. e. 10Ajack for current readings). Refer to the Owner's manual included with your meter for more information.
- Voltage, amperage, and resistance values included in this manual are obtained with a Fluke® 77 Digital Multimeter (PV-43568). This meter is used for when diagnosing electrical problems. Readings obtained with other meters may differ.
- Pay attention to the prefix on the multimeter reading (K, M, etc.) and the position of the decimal point.
- For resistance readings, isolate the component to be tested. Disconnect it from the wiring harness or power supply.

Troubleshooting

No Spark, Weak or Intermittent Spark

- Spark plug gap incorrect
- Fouled spark plug
- Faulty spark plug cap or poor connection to high tension lead
- Related wiring loose, disconnected, shorted or corroded
- Engine stop switch or ignition switch faulty
- TRS switch mis-adjusted or faulty
- Wire harness or connections wet, corroded or broken
- Poor ignition coil ground
- Incorrect wiring after repair (inspect color coding in connectors, etc.)
- Faulty ignition coil windings (measure resistance of primary and secondary)
- Sheared flywheel key
- Flywheel Loose or damaged
- Excessive crankshaft runout - should not exceed .0024"
- Faulty ECU
- Faulty CPS
- Low Battery

EFI Component Testing

All EFI component information and diagnostic testing procedures are located in **Chapter 4**.

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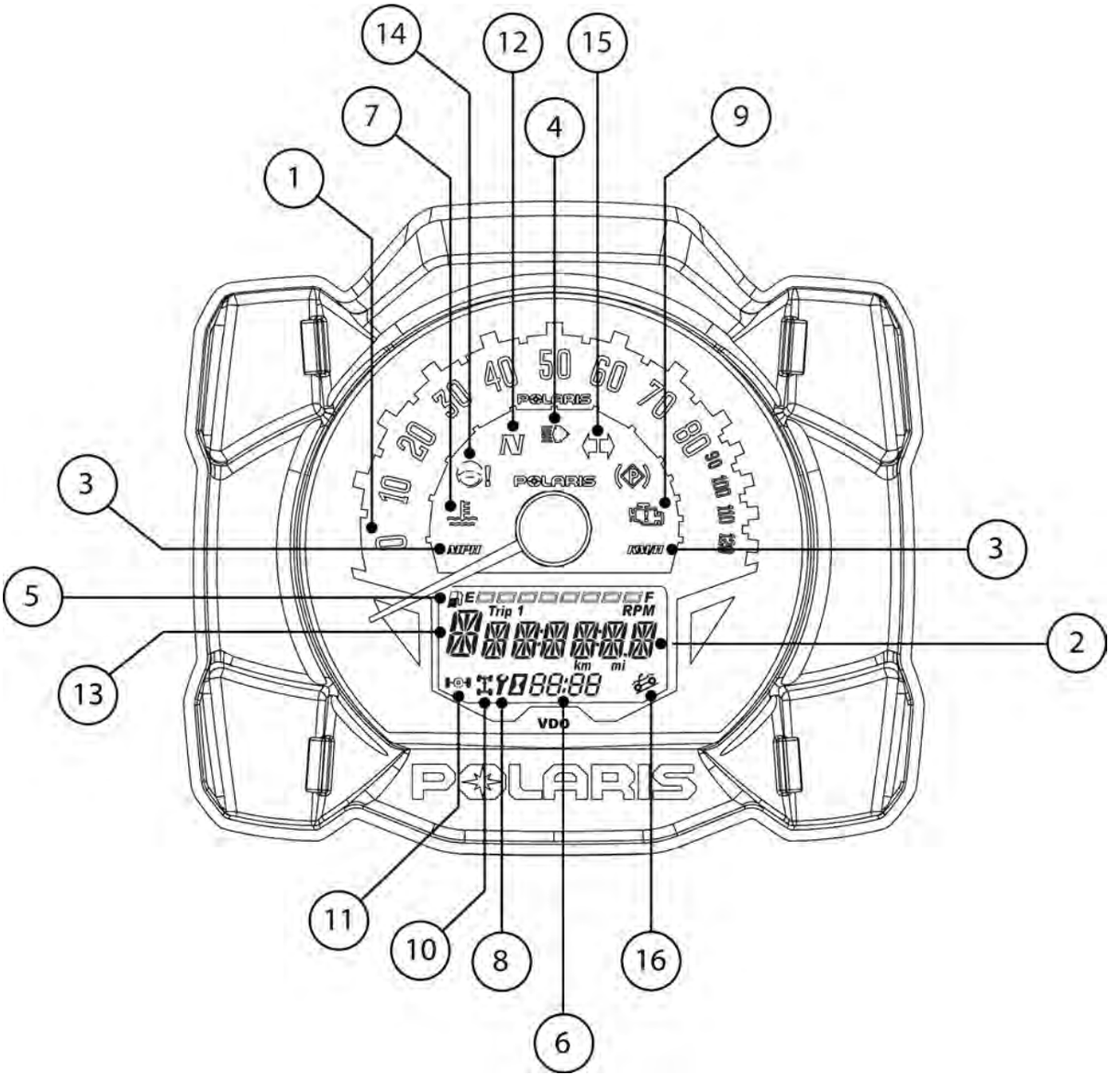
INSTRUMENT CLUSTER

Overview

The instrument cluster displays critical vehicle information to the user. Reference the following page for display functions and descriptions.



NOTE: Some features are not applicable to all models.

The use of a high pressure washer may damage the instrument cluster. Wash the ATV by hand or with a garden hose using mild soap. Certain products, including insect repellents and chemicals, will damage the instrument cluster lens. Do not use alcohol to clean the instrument cluster. Do not allow insect sprays to contact the lens. Immediately clean off any gasoline that splashes on the instrument cluster.

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Rider Information Display

The rider information display is located in the instrument cluster. All segments will light up for 1 second at start-up.

NOTE: If the instrument cluster fails to illuminate, a battery over-voltage may have occurred and the instrument cluster may have shut off to protect the electronic speedometer.

The reverse override button on the LH control acts as the MODE button when pressed and released quickly. The transmission cannot be in reverse when using the override button as a MODE button.

1. **Vehicle Speed Display** - Analog display of vehicle speed in MPH or km/h.
2. **Information Display Area - Odometer / Trip Meter / Tachometer / Engine Hours / Service Info / Clock** - LCD display of the service hour interval, total vehicle miles or km., total engine hours, trip meters and engine RPM.
3. **MPH / KM/H Display** - MPH is displayed when the instrument cluster is in the *Standard* mode. KM/H is displayed when the instrument cluster is in the *Metric* mode.
4. **High Beam Indicator** LED icon illuminates whenever the LH control headlamp switch is in the high beam position.
5. **Fuel Level Indicator** - LCD bar graph indicating current fuel level. All segments will flash when the last segment is cleared indicating a low fuel warning.
6. **Clock** - Displays current time in either 12-hour or 24-hour formats.
7. **Engine Temperature Indicator** - LED icon illuminates when the ECM determines the engine is overheating. The indicators will initially flash to indicate the engine is overheating. The indicators will stay lit and not flash if a severe overheating condition exists.
8. **Service Interval Indicator** - Preset at the factory and adjustable by the user, a flashing wrench symbol alerts the operator that the preset service interval has been reached and maintenance should be performed. The wrench icon will flash for 10 seconds upon start-up once it reaches 0.
9. **Check Engine MIL** - Illuminated when the ECM has detected a Diagnostic Trouble Code in the engine management system.
10. **AWD Indicator** - Illuminated when the RH control switch is in either *4x4* or *ADC 4x4* position.
11. **TURF Indicator** - Illuminated when the RH control switch is in the *TURF* position (X2 Models Only).
12. **Neutral Gear Indicator** - LED icon illuminates when gear selector is in the neutral (N) position.
13. **Gear Position Indicator -** Displays gear selector position.

    H = High

    L = Low

    N = Neutral

    R = Reverse

    P = Park

    – = Gear Signal Error (shifter stuck between gears)
14. **Power Steering System MIL -** LED icon illuminates when a fault has occurred with the power steering system. This indicator illuminates when the key is turned to the ON position and goes off when the engine is started.
15. **Turn Signal / Hazard Lamp Indicator** - LED icon illuminates whenever the LH, RH or hazard lamps are activated (International Models Only).
16. **Active Descent Control Indicator** - Illuminated when the RH control switch is in the *ADC 4x4* position and ADC is active.

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Information Display Area

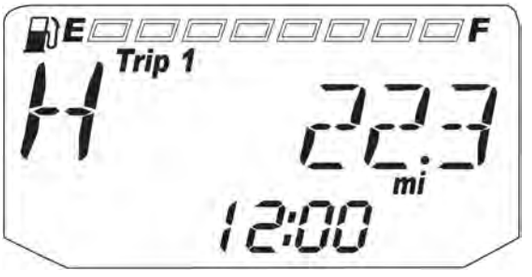
The LCD portion of the instrument cluster is the information display area. Information displayed in this area includes: odometer, trip meters, engine RPM, engine hours, service interval, clock, engine Diagnostic Trouble Codes (DTCs) and power steering DTCs.

The reverse override button on the LH control acts as the MODE button when pressed and released quickly. The transmission cannot be in reverse when using the override button as a MODE button.

Odometer

The odometer records and displays the total distance traveled by the ATV. The odometer can not be reset.

Trip Meters (Trip1 / Trip 2)



The trip meters records the miles traveled by the ATV on each trip. To reset the trip meters:

1. Toggle the MODE button to *Trip 1*.
2. To reset to 0, push and hold the MODE button until the distance display changes to 0.
3. Perform this same procedure to reset *Trip 2*.

Tachometer (RPM)

Engine RPM can be displayed digitally.

Engine Hours

Engine hours are logged anytime the engine is running. Total hours can not be reset.

Programmed Service Interval

The initial factory service interval setting is 50 hours. Each time the engine is started, the engine hours are subtracted from the service interval hours. When the service interval reaches 0, the LCD wrench icon will flash for approximately 10 seconds each time the key is turned ON.

To change the hour setting or reset the function, follow these steps:

1. Toggle the MODE button until the wrench icon is displayed in the information area.
2. Press and hold the MODE button until the information display area begins to flash.
3. Toggle the MODE button to increase the service interval hours in 5 hour increments to a maximum of 100 hours.
4. To turn off the service interval function, toggle the MODE button until “OFF” is displayed.

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Clock

The clock displays the time in a 12-hour or 24-hour format. Refer to “Units of Measurement” to change the format (Standard 12-hour / Metric-24 hour). To set the clock, follow these steps:

1. Toggle the MODE button until the odometer is displayed.
2. Press and hold the MODE button until the hour segment flashes. Release the button.
3. With the segment flashing, tap the MODE button to advance to the desired setting.
4. Press and hold the MODE button until the next segment flashes. Release the button.
5. Repeat steps 3-4 twice to set the 10 minute and 1 minute segments. After completing the 1-minute segment, step 4 will save the new settings and exit the clock mode.

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Units of Measurement

	STANDARD DISPLAY	METRIC DISPLAY
Distance	Miles (MPH)	Kilometers (KM/H)
Time	12-Hour Clock	24-Hour Clock

To change between Standard and Metric units of measurement, follow these steps:

1. Turn the key to the OFF position.
2. Press and hold the MODE button while turning the key to the ON position.
3. When the display flashes the distance setting, tap the MODE button to advance to the desired setting.

4. Press and hold the MODE button to save the setting and advance to the next display option.
5. Repeat the procedure to change remaining display settings.

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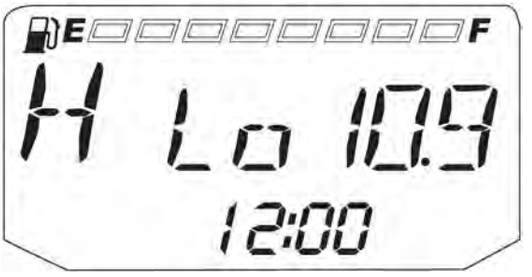
Under / Over Voltage

This warning usually indicates that the vehicle is operating at an RPM too low to keep the battery charged. It may also occur when the engine is at idle and a high electrical load is applied (lights, cooling fan or other accessories).

If battery voltage drops below 11 volts, a warning screen will display “Lo” and provide the present battery voltage. If voltage drops below 8.5 volts, LCD backlighting and icons will turn off.



If battery voltage rises above 15 volts, a warning screen will display “OV” and provide the present battery voltage. If voltage rises above 16.5 volts, LCD backlighting and icons will turn off.

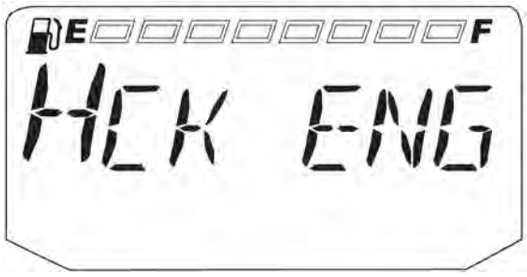
Diagnostic Mode

The diagnostic mode is accessible only when the check engine MIL has been activated.

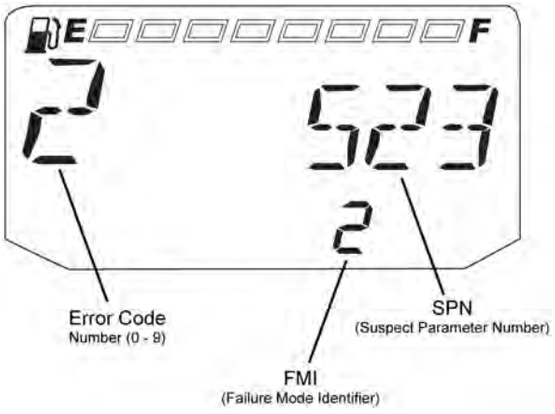
NOTE: If there is a diagnostic problem with the power steering system, the power steering MIL will illuminate and blink in place of the check engine MIL.

Use the following procedure to display diagnostic trouble codes that were activated during current ignition cycle causing the MIL to illuminate. Diagnostic trouble codes will remain stored in the gauge (even if MIL turns off) until the key is turned off.

1. If the trouble code(s) are not displayed, use the MODE button to toggle until “CK ENG” displays on the information display area.



2. Press and hold the MODE button to enter the diagnostics code menu.
3. A set of three numbers will appear in the information display area.
   - The first number (located far left) can range from 0 to 9. This number represents the total number of trouble codes present (example: 2 means there are 3 codes present).
   - The second number (located top right) can be 2 to 6 digits in length. This number equates to the suspected area of fault (SPN).
   - The third number (located bottom right) can be 1 to 2 digits in length. This number equates to the fault mode (FMI).



4. Use the trouble code reference table in the EFI Chapter for a description of each code.
5. If more than one code exists, press the MODE button to advance to the next trouble code.
6. To exit diagnostic mode, press and hold MODE button or turn ignition key OFF once the codes are recorded.

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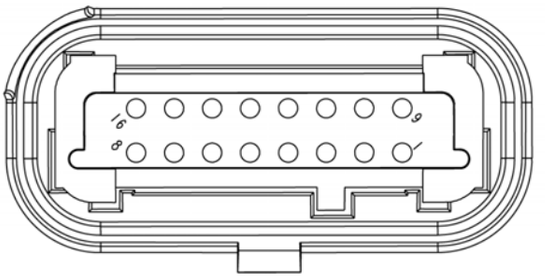
Instrument Cluster Pinouts



FUNCTION	PIN
CAN High	1
CAN Low	2
Switched Power (Vdc)	3
Constant Power (Vdc)	4
Ground	5
High Beam Input	8
Fuel Level Sensor	11
International Models Only	
Turn Signal Input, LH	6
Turn Signal Input, RH	7

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CONTROLLER AREA NETWORK (CAN)

This vehicle uses a Controller Area Network (CAN) to perform some functions. Similar to a computer network, CAN establishes a communication network between the ECM and several on-board components.

The CAN network includes:

- ECM
- Instrument Cluster
- Digital Wrench Diagnostic Plug
- Electronic Power Steering (EPS models only)

NOTE: DO NOT SPLICE OR CUT INTO THE CAN YELLOW OR GREEN WIRE CIRCUITS.

CAN Troubleshooting

No CAN functionality can be indicated by the following items not working on the instrument cluster:

- No engine speed displayed
- No vehicle speed displayed
- No gear position displayed
- Odometer / Tripmeters not working
- Reverse override button does not toggle between display modes
- ECM-monitored inputs are not displayed when DTCs or problems exist, i.e. check engine LED, engine overheat LED, etc.
- There is power at the Smart Link connector, but it cannot connect to Digital Wrench

To test the CAN circuit, turn the ignition key to OFF, and then use a multimeter to verify there is 60 +/- 10 ohms between the CAN High (YELLOW) and CAN Low (GREEN) wires on the diagnostic connector.

If 120 ohms is measured at the connector, there is a break somewhere within the CAN circuit.

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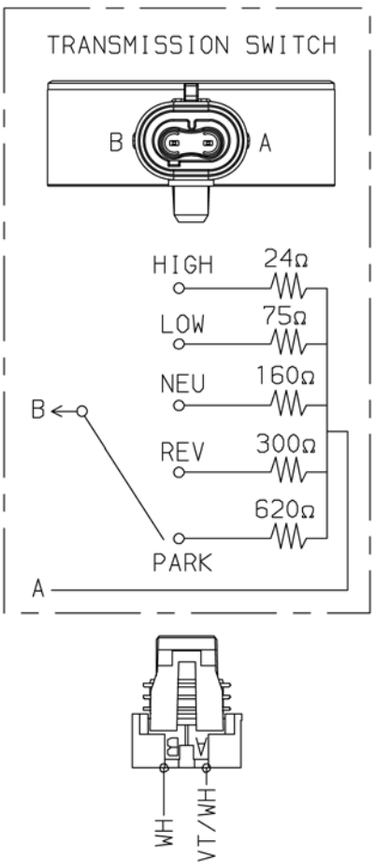
TRANSMISSION (GEAR POSITION) SWITCH

1. The transmission (gear position) switch is located on the RH side of the transmission and can be accessed through the RH wheel well area.
2. Disconnect the transmission switch harness by lifting the connector lock and pulling on the connector. Do not pull on the wiring.
3. Test the transmission switch continuity readings for each gear position and compare to the specification table below.



Gear Position	**Resistance Value** when measured at switch terminals A and B
HIGH	24 Ω
LOW	75 Ω
NEU	160 Ω
REV	300 Ω
PARK	620 Ω

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ALL WHEEL DRIVE (AWD) COIL

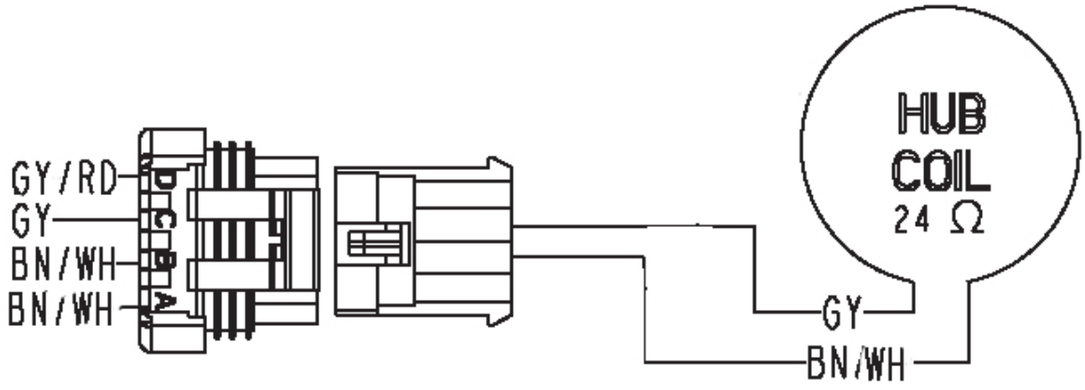
Operation Overview

- Switch must be set to '4x4'. 12Vdc power is present at the AWD hub coil.
- The instrument cluster senses grounding at pin #16. AWD icon should turn on at the instrument cluster.
- System must be grounded to operate.

Diagnosing System Failures

- Verify the AWD switch is functional.
- Verify the AWD hub coil is functional. Test the AWD hub coil using an ohm meter.

EFI Shown



AWD Hub Coil Resistance: 24 Ω ± 5%

- Verify the wiring harness, wiring, connectors, connector pins and grounds are undamaged, clean and connect properly.
- Verify continuity of wire connections with a known good volt/ohm meter.

  NOTE: Verify all wires and wiring connections have been tested properly with a known good volt/ohm meter before suspecting a component failure. A high percentage of electrical issues are caused by bad/ failed connections and grounds.

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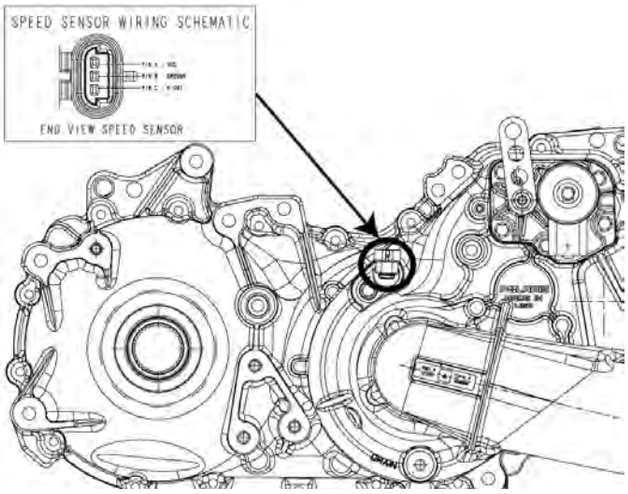
SPEED SENSOR

Speed Sensor Location

The speed sensor is located on the RH transmission case and can be accessed through the rear RH wheel well area.



NOTE: Image For Reference Only.

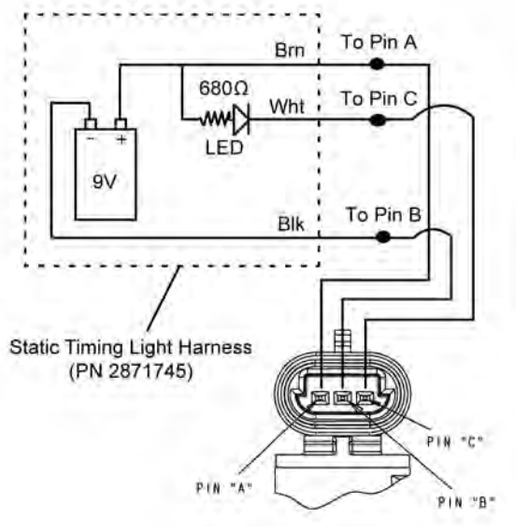
Speed Sensor Testing

Special Tools Required:

Static Timing Light Harness (PN 2871745)

Hall Sensor Probe Harness (PN 2460761)

1. Disconnect the 3 wire harness from the speed sensor and remove the sensor from the transmission.
2. Connect the wires from the Static Timing Light Harness to the sensor 3 pin connector using the Hall Sensor Probe Harness (PN 2460761).
3. Pass a screwdriver back and forth in front of the sensor tip.
4. Be sure connections are good and 9V battery is in good condition. If the light flashes, the sensor is good.



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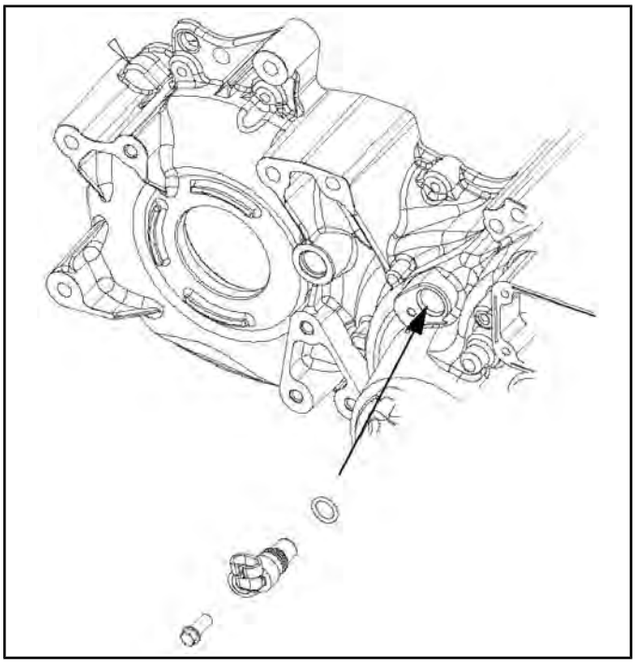
Testing

Using the special tools listed, test the speed sensor according to the tester instructions. Remove sensor and inspect the o-ring seal for damage or wear and replace as required. Replacement of sensor is required as it is not serviceable.



Speed Sensor
Test Using Special Tools:

Static Timing Light Harness
PN 2871745

Hall Sensor Probe Harness
PN 2460761

Replacement

1. Remove the sensor retaining using a suitable tool.
2. Coat o-ring of new sensor with anti-seize compound or sealant.
3. Push new sensor into gearcase housing. Install bolt and tighten to specification.

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Speed Sensor Bolt: **8-12 ft-lbs (11-17 Nm)**

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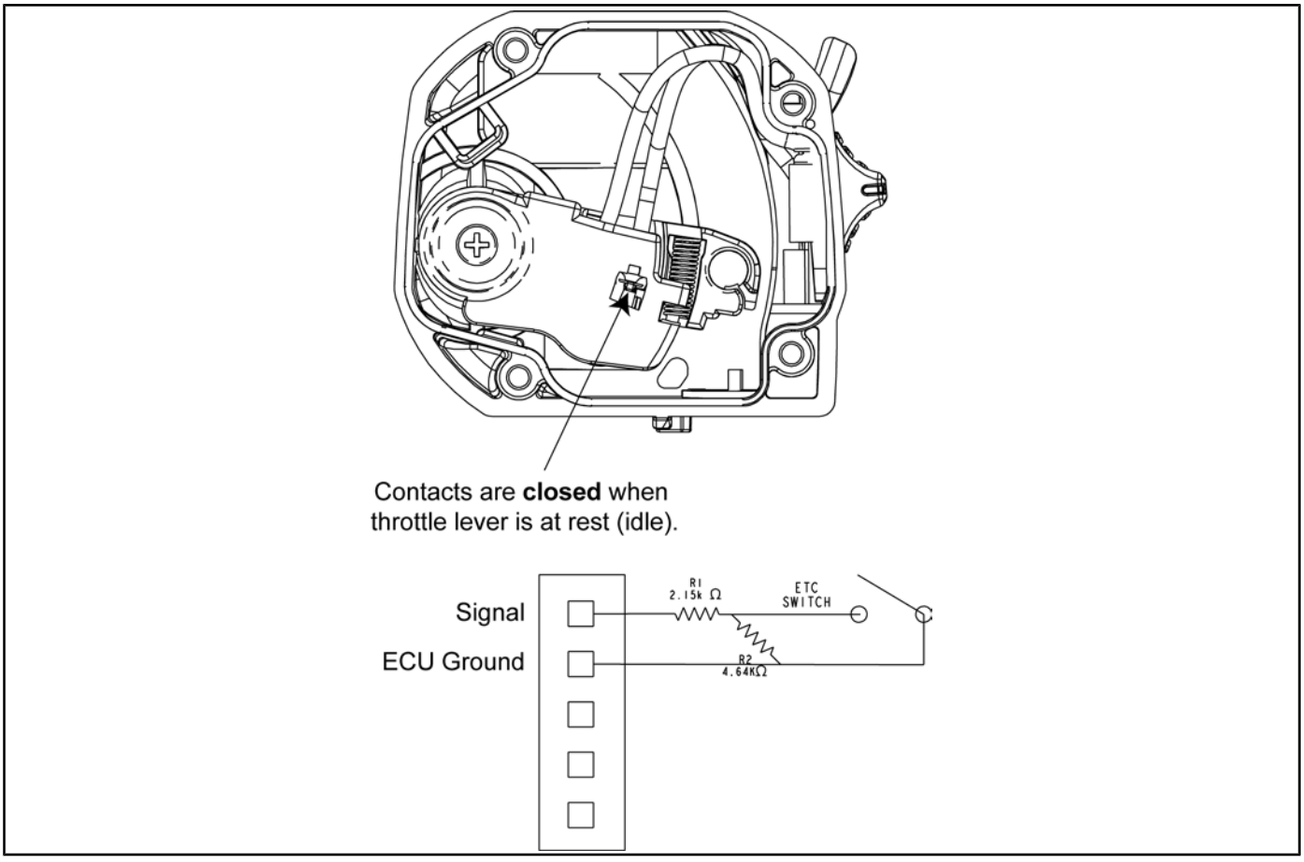
THROTTLE RELEASE SWITCH (TRS)

Throttle Release Switch (TRS)

The Throttle Release Switch (TRS) switch is designed to close during throttle movement in the event the throttle cable sticks or breaks.

When the throttle lever is at idle position, the TRS switch contacts should be closed (touching). When the throttle lever is moved the contacts will open and allow normal operation. If the contacts remain closed or become closed during throttle movement, the ECM will limit engine RPM.



NOTE: The throttle cable must have the proper amount of free-play adjustment. Refer to Chapter 2 "Throttle Cable Adjustment" procedure.

TRS SWITCH - CONTACT POSITIONS	
Throttle Lever at Rest (idle)	TRS is CLOSED. Pins 1 and 2: 2.15kΩ
Normal Operation (throttle open or above idle)	TRS is OPEN. Pins 1 and 2: 6.76kΩ
Throttle Cable Stuck	TRS is CLOSED Pins 1 and 2: 2.15kΩ

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COOLING SYSTEM COMPONENTS

Fan Control Circuit Operation

Power is supplied to the fan via the Orange/Black wire when the relay is ON. The ground path for the fan motor is through the Brown harness wire. Refer to “RELAYS” later in this chapter for more information on fan functions.

CAUTION

Keep hands away from fan blades during operation. Serious personal injury could result.

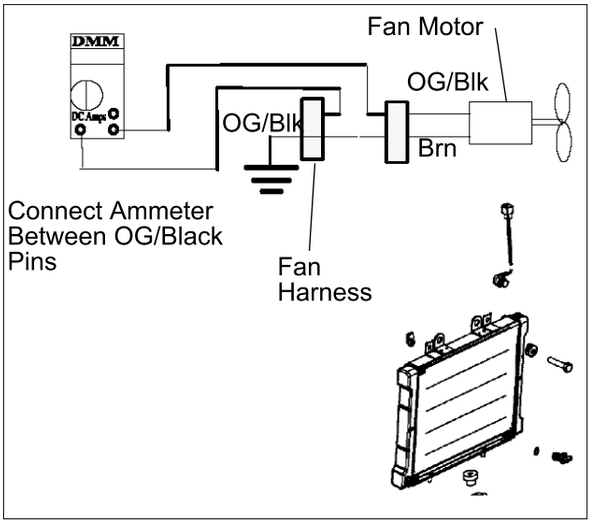
NOTE: The fan may not function or operation may be delayed if coolant level is low or if air is trapped in the cooling system. Be sure cooling system is full and purged of air. Refer to Maintenance Chapter 2 for cooling system information.

Fan Control Bypass Test

1. Disconnect harness from coolant temperature sensor on engine.
2. With the ATV in “Park” and with the parking brake on, turn the ignition key and engine stop switch “ON”. Start the engine. The fan should start running.
3. If the fan does not run or runs slowly, check the fan motor wiring, ground, motor condition for proper operation (refer to “FAN MOTOR CURRENT DRAW” in this section). Repair or replace as necessary. If the fan runs with the sensor harness disconnected, but will not turn on when the engine is hot, check the coolant temperature sensor, wires, grounds, connector terminals.

Fan Motor Current Draw Test

A current draw test will provide a good indication of fan motor condition. A worn or damaged fan motor will draw more current, which causes a reduction in blade speed and reduced cooling.



1. Disconnect the harness from the coolant sensor.
2. Connect a DC ammeter in-line on the fan switch harness wires. See illustration*(An inductive ammeter is required)*.
3. Be sure fan blade is free to rotate.
4. Turn ignition key and engine stop switch to “ON” position. Read the current draw on ammeter with fan running.
5. *(Direct 12 Vdc to fan required)*
6. If the fan motor draws more than 10 Amps, replace the motor.
   d

Fan Motor Current Draw:
Should Be Less Than 10 Amps

NOTE: Fan motor current draw specification may vary.

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Coolant Temperature Sensor

The coolant temperature sensor can be tested using an ohmmeter.

If the ECT circuit is open, the engine Hot light and fan will both come on. With the engine at an ambient temperature of 68° F (20° C), disconnect lead and measure the resistance of sensor between the two ECT terminals and compare to the specification listed.

1. With the engine and temperature sensor at room temperature (68° F = 20° C), disconnect the harness connector.
2. With the meter in the ohms mode, place the meter leads onto the sensor contacts.
3. Use the Temperature / Resistance table to determine if the sensor needs to be replaced.

TEMPERATURE °F (°C)	RESISTANCE
68 °F (20 °C)	2.5 kΩ ± 5%
212 °F (100 °C)	186 Ω ± 5%

NOTE: If the coolant temperature sensor or circuit malfunctions the radiator fan will default to 'ON'.

The fan may not function or operation may be delayed if coolant level is low or if air is trapped in the cooling system. Verify the cooling system is full and purged of air. Refer to Maintenance Chapter 2 for cooling system information.

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ELECTRONIC POWER STEERING (EPS)

EPS Operation

The EPS module is an intelligent electronic power steering system that operates off of the vehicle's 12V electrical system. It calculates steering assist by sensing the difference between the input torque of the steering post 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. The system is Polaris Digital Wrench® compatible for simplified diagnostics and system troubleshooting through the vehicle's diagnostic port.

With the engine off and the key on, the power steering unit will operate for up to five minutes. After the five minutes, you will need to cycle the key switch and restart the engine to regain power steering operation.

The Power Steering 30A Fuse.

- If the fuse fails, the Power Steering Malfunction Indicator Light (MIL) on the instrument cluster will illuminate. During this time, the vehicle will have no power steering operation. You will be able to connect and communicate with the vehicle's Engine Controller, but not the Power Steering Controller, while using Digital Wrench®.

  NOTE: DO NOT SPLICE OR CUT INTO THE CAN CIRCUITS.

CAUTION

Electronic Power Steering (EPS) units are not interchangeable between ATV and *RANGER* product lines.

NOTE: Refer to Chapter 10 "Steering / Suspension" for power steering unit removal and installation procedures. EPS Unit Removal, page 5.27

WIRE COLOR	FUNCTION
ORANGE	Key-On / Run Switch On Battery Voltage / EPS Power
RED	Battery Voltage
BROWN	Ground
YELLOW	CAN High Signal
GREEN	CAN Low Signal

Proper EPS System Diagnosing

READ BEFORE YOU REPLACE THE EPS UNIT!

NOTE: Try to reflash the EPS unit before attempting to replace it. A simple reflash may be all that is needed to repair the EPS problem. Always reflash the EPS unit as the first step in diagnosing an EPS problem.

EPS Circuit

NOTE: Refer to "Cooling Fan & EPS" breakout diagram near the end of this Chapter.

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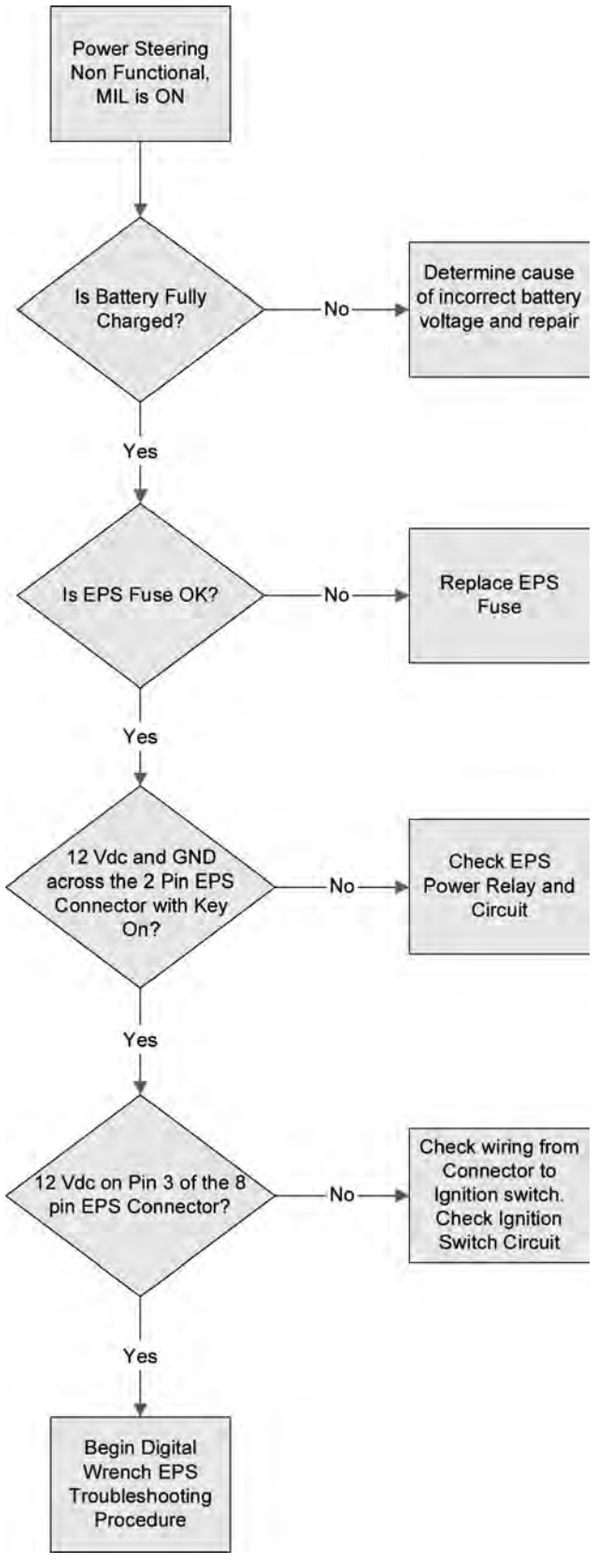
EPS Troubleshooting



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STARTER SYSTEM

Troubleshooting

Starter Motor Does Not Run

- Battery discharged. Low specific gravity
- Loose` or faulty battery cables or corroded connections (see Voltage Drop Tests)
- Related wiring loose, disconnected, or corroded
- Poor ground connections at battery cable, starter motor or starter solenoid (see Voltage Drop Tests)
- Faulty key switch
- Faulty kill switch
- Faulty starter solenoid or starter motor.
- Engine problem - seized or binding (Can engine be rotated easily with recoil starter?)
- Starter lockout malfunction

Starter Motor Turns Over Slowly

- Battery discharged - low specific gravity
- Excessive circuit resistance - poor connections (see Voltage Drop Test below)
- Engine problem - seized or binding (Can engine be rotated easily?)
- Faulty or worn brushes in starter motor

Starter Motor Turns - Engine Does Not Rotate

- Faulty starter drive
- Faulty starter drive gears or starter motor gear
- Faulty flywheel gear or loose flywheel

Voltage Drop Test

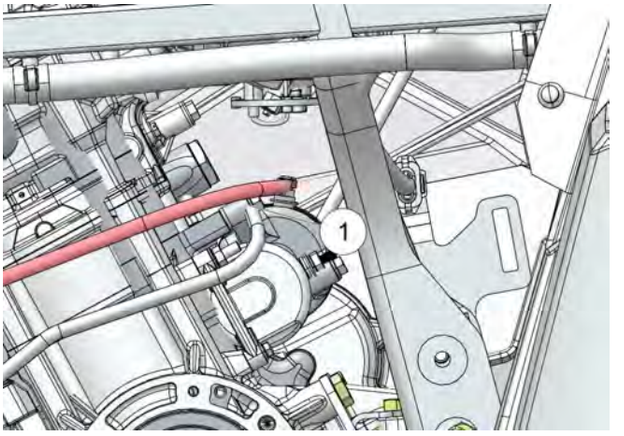
The Voltage Drop Test is used to test for bad connections. When performing the test, you are testing the amount of voltage drop through the connection. A poor or corroded connection will appear as a high voltage reading. Voltage shown on the meter when testing connections should not exceed .1 Vdc per connection or component.

To perform the test, place the meter on DC volts and place the meter leads across the connection to be tested.

Voltage should not exceed .1 Vdc per connection

Starter Motor Removal

1. Remove the seat, left side panel, and disconnect the battery.
2. Remove the (+) positive wire (A) from the starter motor terminal.
3. Remove the upper starter motor fastener (1) securing the starter motor and (-) negative battery cable to the engine. Completely loosen the lower starter motor fastener.



NOTE: The (-) negative battery cable is mounted to the engine using the upper starter mounting bolt.

4. Remove the starter from the engine.

Starter Motor Installation

1. Inspect and replace starter motor O-ring if needed.
2. Lubricate the starter motor O-ring with fresh engine oil.
3. Place the lower starter motor fastener through the lower mounting boss in the starter motor.
4. Install the starter motor onto the engine case.
5. Install the (-) negative battery cable in the upper starter bolt and hand tighten the upper starter mounting bolt.
6. Install and torque the lower mounting bolt to specification.

NOTE: Tighten the lower starter bolt first, as the bottom hole acts as a pilot hole to properly align the starter drive (bendix) with the flywheel. This helps prevent binding and starter damage.

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7. Torque the upper starter mounting bolt to specification.

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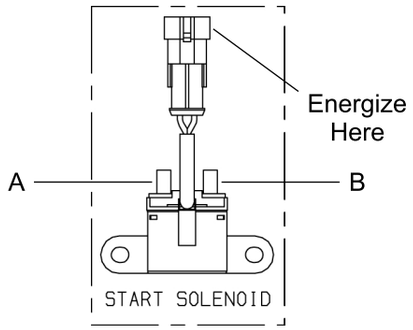
Starter Mounting Bolts and Nut: **7 ft. lbs. (10 Nm)**

8. Connect the (-) negative battery cable, install the seat, and left side panel.

Starter Solenoid Bench Test

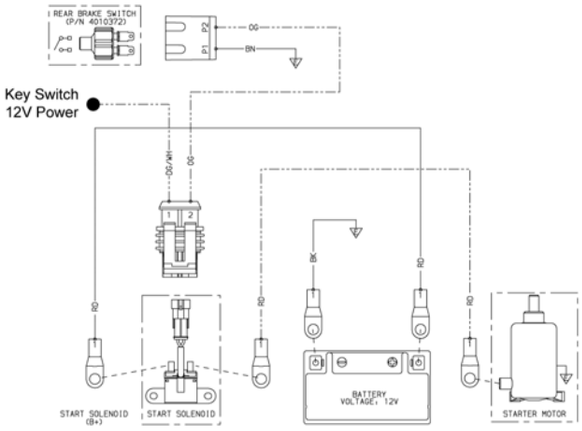
Test the start solenoid by powering the solenoid using battery voltage for a *maximum of 5 seconds*. With the solenoid energized, resistance should read about 0 - 0.5 Ohms between terminals (A) and (B). If resistance measurement is out of specification, replace the starter solenoid.



Starter Solenoid Operation

To energize the Starter Solenoid the following must occur:

- The brake must be applied to provide a ground path via the Orange wire.
- The key switch must be turned to the “start” position to provide 12V power via the Green / White wire.
- Once the pull-in coil is energized, the solenoid provides a current path for 12V power to reach the starter motor.



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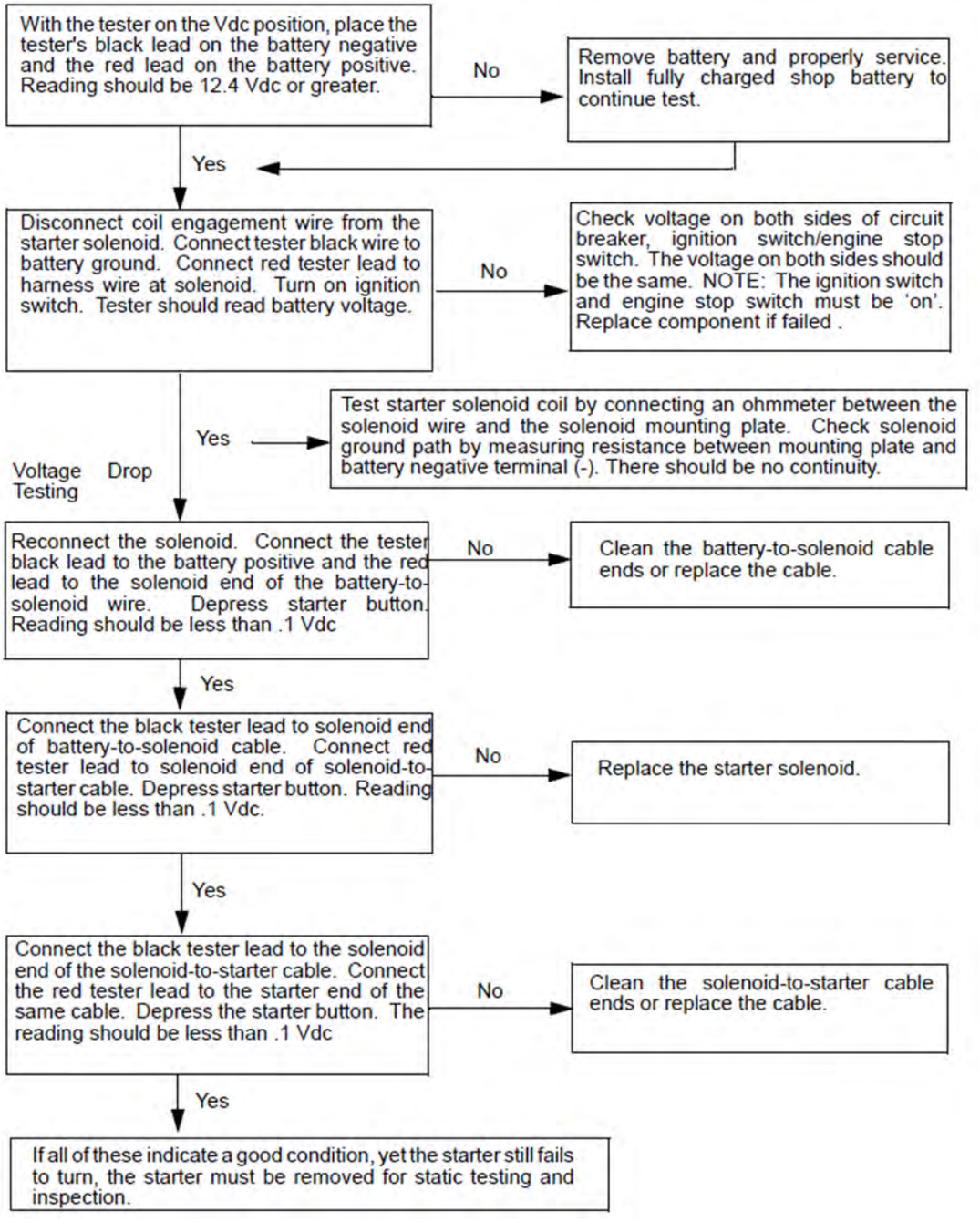
STARTER SYSTEM TESTING FLOW CHART

Condition: Starter fails to turn motor. NOTE: Make sure engine crankshaft is free to turn before proceeding with dynamic testing of starter system. A digital multitester must be used for this test. This flow chart assumes that the starter lockout system is functional.



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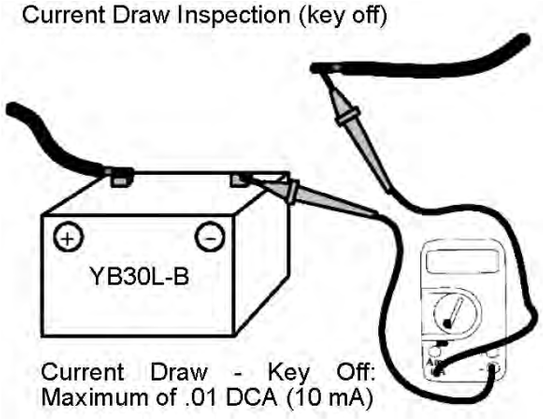
CHARGING SYSTEM

Current Draw - Key Off

Do not connect or disconnect the battery cable or ammeter with the engine running. Damage will occur to electrical components.

Connect an ammeter in series with the negative battery cable. Check for current draw with the key off. If the draw is excessive, loads should be disconnected from the system one by one until the draw is eliminated. Check component wiring as well as the component for partial shorts to ground to eliminate the draw.

Current Draw Inspection (key off)



Break Even Test

CAUTION

Do not connect or disconnect the battery cable or ammeter with the engine running. Damage will occur to electrical components.

The “break even” point of the charging system is the point at which the alternator overcomes all system loads (lights, etc.) and begins to charge the battery. Depending on battery condition and system load, the break even point may vary slightly. The battery should be fully charged before performing this test.

WARNING

Never start the engine with an ammeter connected in series. Damage to the meter or meter fuse will result. Do not run test for extended period of time. Do not run test with high amperage accessories.

1. Connect a tachometer to the engine.
2. Using an inductive amperage metering device, (set to DC amps) connect to the negative battery cable.
3. With engine off and the key, kill switch, and lights in the ON position, the ammeter should read negative amps (battery discharge). Reverse meter lead if a positive reading is indicated.
4. Shift transmission into Park and start the engine. With the engine running at idle, observe meter readings.
5. Increase engine RPM while observing ammeter and tachometer.
6. Note RPM at which the battery starts to charge (ammeter indication is positive).
7. With lights and other electrical loads off, the “break even” point should occur at approximately 1500 RPM or lower.
8. With the engine running, turn the lights on and engage parking brake lock to keep brake light on.
9. Repeat test, observing ammeter and tachometer. With lights on, charging should occur at or below 2000 RPM.

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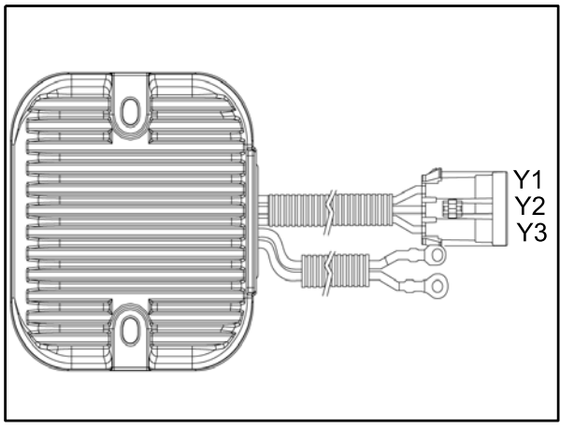
Alternator Output Test

Three tests can be performed using a multimeter to determine the condition of the stator (alternator).



TEST 1: Resistance Value of Each Stator Leg

1. Measure the resistance value of each of the three stator legs: Y1 to Y2, Y1 to Y3, and Y2 to Y3. Each should measure 0.19 ohms ± 15 %.

TEST	CONNECT METER WIRES TO:	READING IN OHMS
Charge Coil	Y1 to Y2	0.2 ohms ± 15%
Charge Coil	Y1 to Y3	0.2 ohms ± 15%
Charge Coil	Y2 to Y3	0.2 ohms ± 15%
Charge Coil	Y1, Y2, or Y3 to Ground	Open (Infinity)

NOTE: If there are any significant variations in ohm's readings between the three legs; it is an indication that one of the three stator legs maybe weak or failed.

TEST 2: Resistance Value of Stator Leg to Ground

2. Measure the resistance value of each of the stator legs to ground: Y1 to Ground, Y2 to Ground, Y3 to Ground.

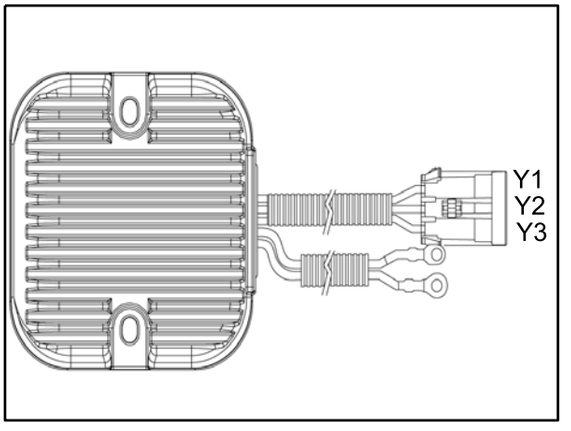
NOTE: Any measurement other than Infinity (open) will indicate a failed or shorted stator leg.

TEST 3: Measure AC Voltage Output of Each Stator Leg at Charging RPM

3. Set the selector dial to measure AC Voltage.
4. Start the engine and let it idle.
5. While holding the ATV at a specified RPM, separately measure the voltage across each “leg” of the stator by connecting the meter leads to the wires leading from the alternator (Y1 to Y2, Y1 to Y3, Y2 to Y3).
6. Refer to the table below for approximate Voltage AC readings according to RPM. Test each leg at the specified RPM in the table.

RPM READING	AC VOLTAGE (VAC) READING
1300	22 VAC ± 25%
3000	51 VAC ± 25%
5000	85 VAC ± 25%

NOTE: If one or more of the stator leg output AC voltage varies significantly from the specified value, the stator may need to be replaced.



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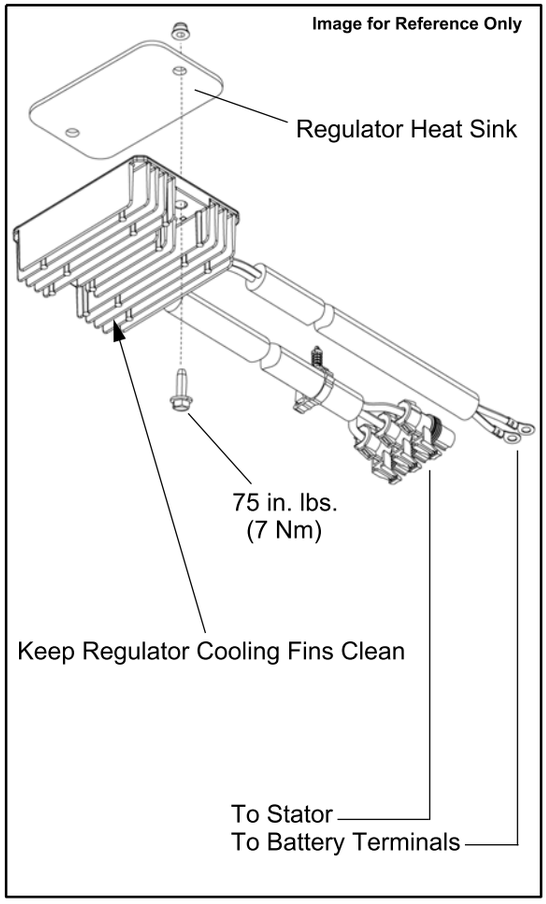
Regulator / Rectifier

The Regulator / Rectifier is located in the left front wheel well area in front of the left front wheel behind the left front inner fender.

NOTE: If the regulator / rectifier overheats, the unit will turn itself off to cool down. The unit will turn on again after it has cooled down. If it turns off, verify the cooling fins are clean, free from debris and that adequate airflow is present.



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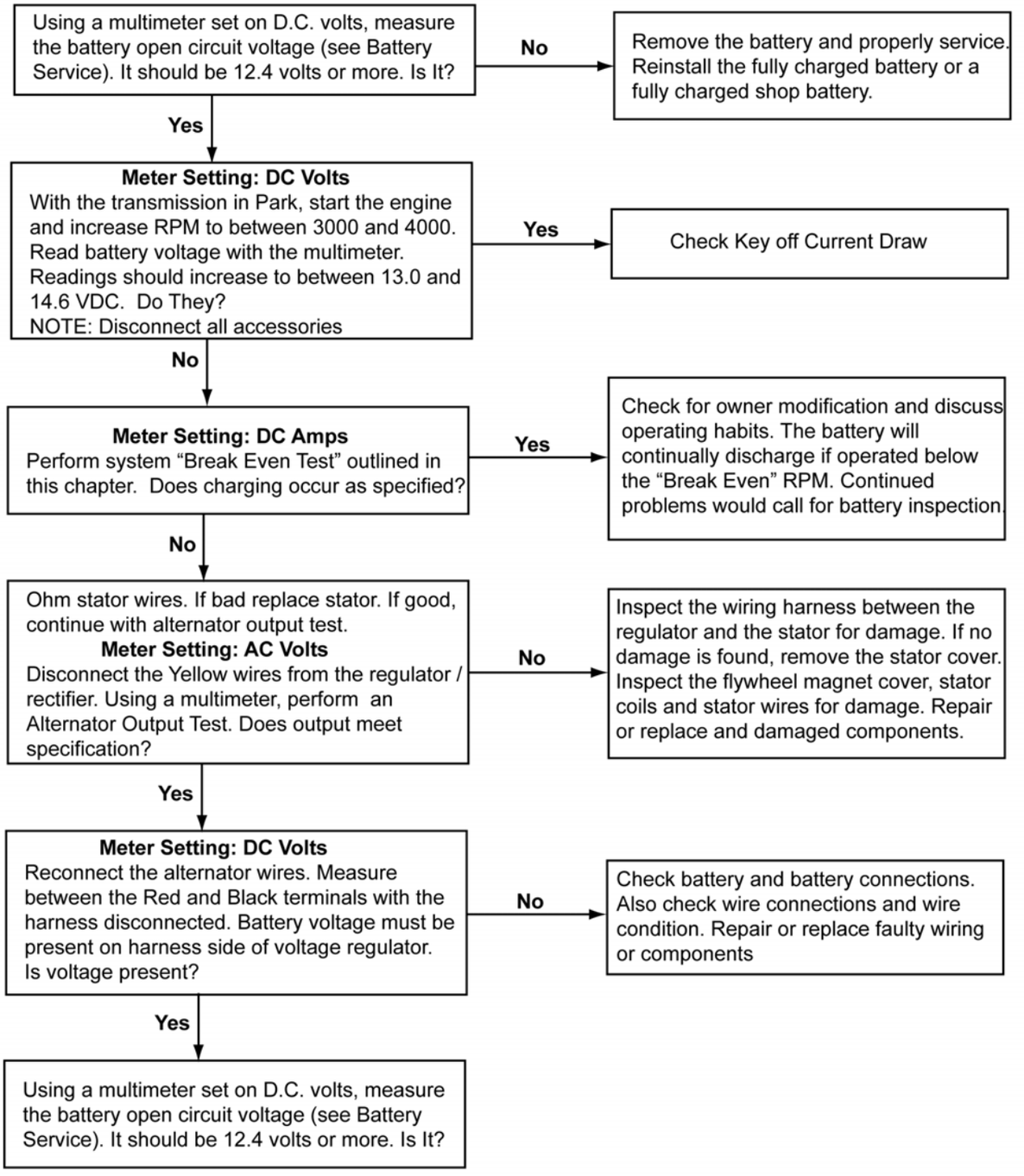
Charging System Testing Flow Chart

Whenever charging system problems are suspected, proceed with the following system check after verifying that all wires are in good condition, connected and not exposed or pinched.



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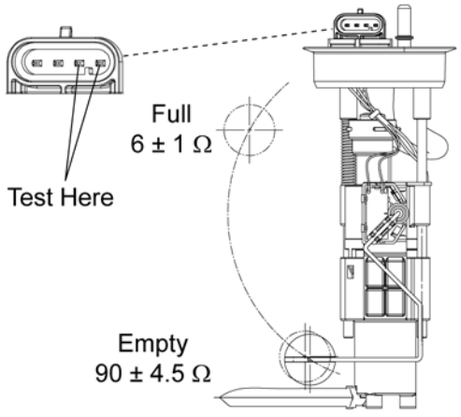
FUEL SENDER

Testing

1. Drain the fuel tank and remove it from the ATV.
2. Set the fuel tank on a flat surface.
3. Hook up an ohm meter to the fuel sender harness wire (B) and wire (C).
4. With the sender float in the **empty position**, the meter should read **6 ohm**s.
5. Slowly tilt invert the tank so that gravity moves the sender float to the **full position**, the meter should now read **90 ohms.**



6. If the readings are not **between 6 ohms and 90 ohms**, or if the reading is erratic or LCD display “sticks”, check the following before replacing the tank assembly.
   - Loose float
   - Float contact with tank
   - Bent Float Rod

   If none of the conditions exists, the sender assembly is faulty.

   NOTE: **In the event of a failure, fuel tank assembly replacement is required on ALL models, as the sender assembly or pump assembly is not serviceable.

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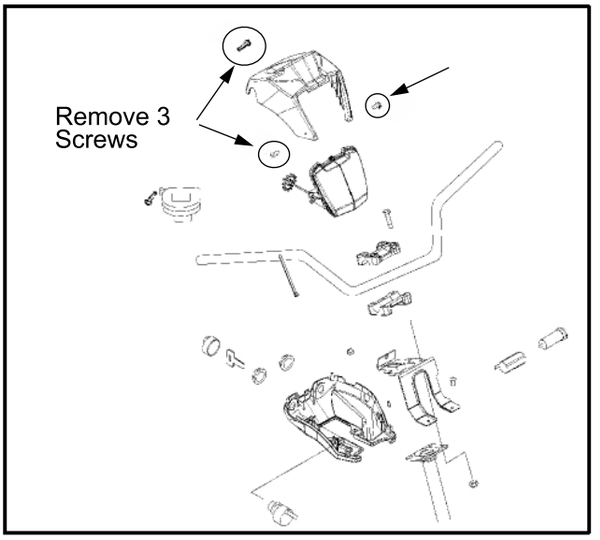
LIGHTING

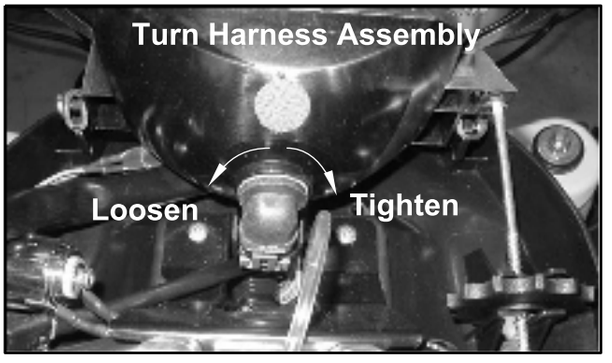
High Beam Headlight Bulb Replacement



CAUTION

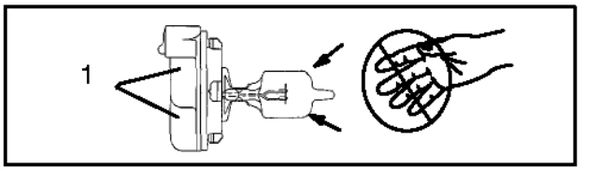
Do not service while headlight is hot. Serious burns may result. Protect lamp during install.

1. Remove three Phillips screws on the headlight pod.
2. Lift pod cover up.
3. Disconnect instrument cluster harnesses from the back of the speedometer.
4. Turn the headlight lamp socket counter-clockwise and remove.



5. Carefully remove headlamp bulb from housing.
6. Remove the headlamp and replace with a new headlamp.

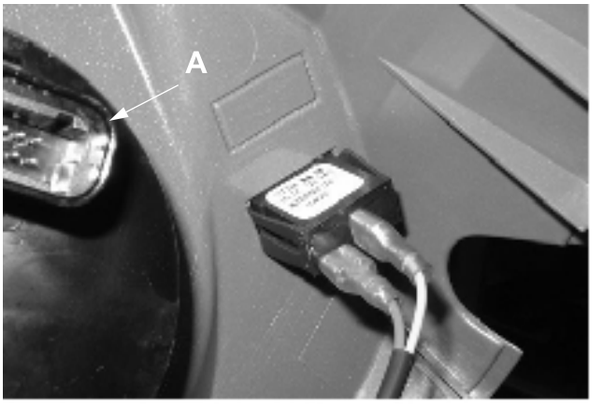
   NOTE: Do not touch the lamp with bare fingers. Hold the plastic part (1) of the lamp. Oil from your skin leaves a residue, causing a hot spot that will shorten the life of the lamp.



7. Install the new headlamp and harness assembly into the headlight assembly. Turn the headlight harness clockwise to secure the headlamp into place.

Headlight Housing Replacement

1. Remove three Phillips screws on the headlight pod.
2. Disconnect instrument cluster harness. (A)



3. Unplug headlamp harness (C).

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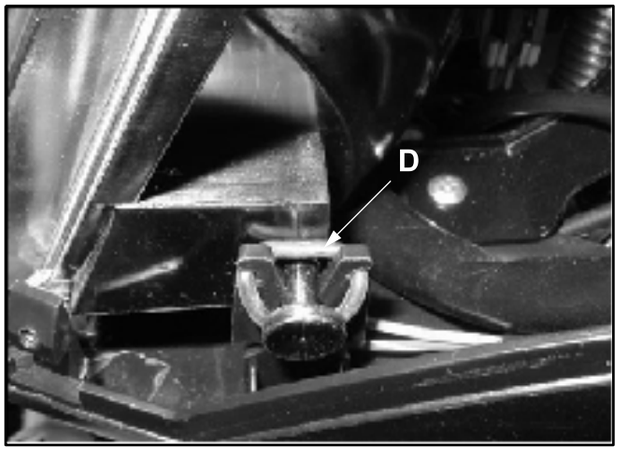
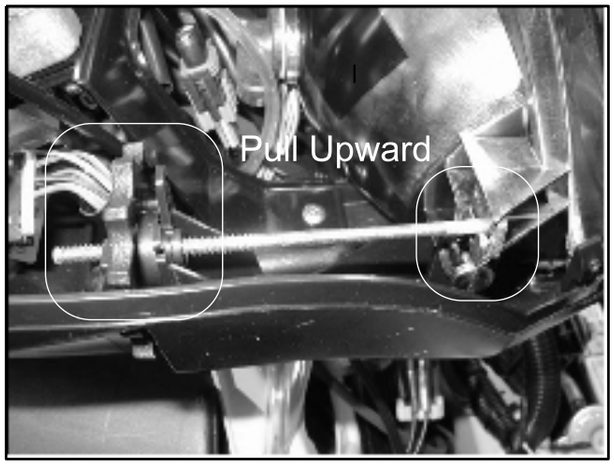
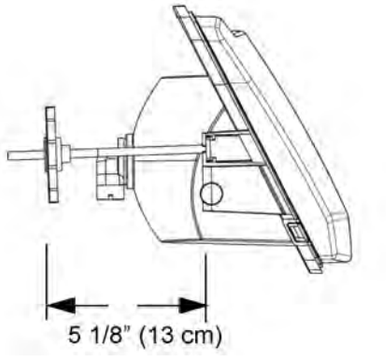
4. Remove O-Ring (D) from headlight pivot pins. (Both Sides)



5. Pull the headlight housing up to release from the locking tabs.



6. Lift the adjusting knob up to remove from the locking tabs.
7. Carefully pull the assembly up and out of pod.
8. Reverse the steps to install the new housing and reassemble the pod.



NOTE: The distance from the headlamp parting line to the end of the adjustment knob stop is 5 1/8", (13 cm). See illustration.

9. Adjust the headlight aim by turning the adjusting knob.

High Beam Headlight Adjustment

The headlight beam can be adjusted to any position desired by turning the adjusting knob located on the bottom right side of the headlight pod.

Raise Headlight - Turn knob counter-counterclockwise

Lower Headlight - Turn knob clockwise

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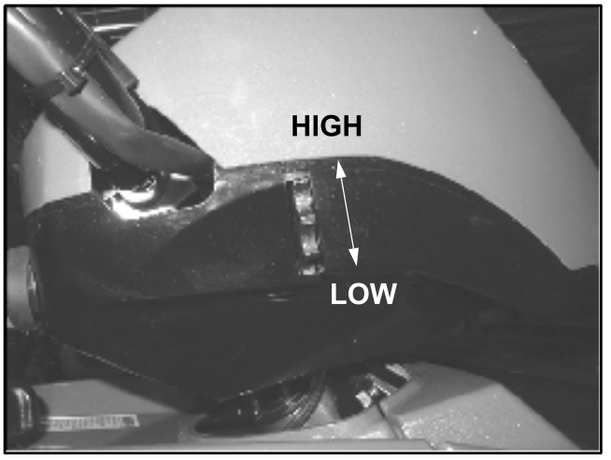
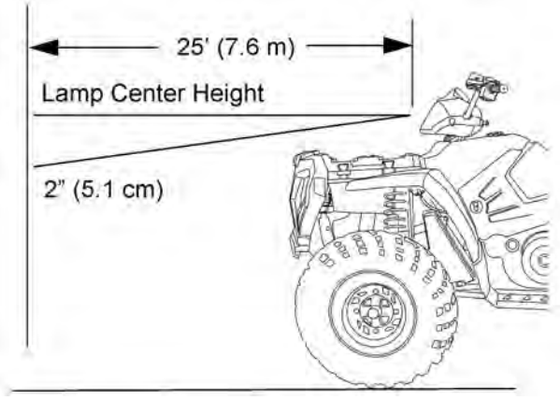


1. Place the vehicle on a level surface with the headlight approximately 25' (7.6 m) from a wall.

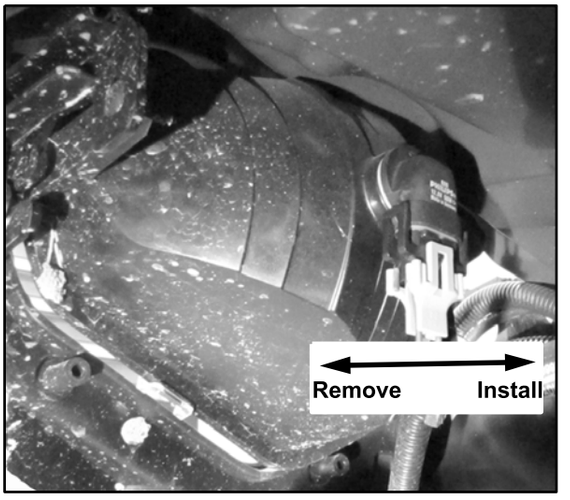


2. Measure the distance from the floor to the center of the headlight and make a mark on the wall at the same height.
3. Start the engine and turn the headlight switch to high beam.
4. Observe headlight aim. The most intense part of the headlight beam should be aimed 2" (5.1 cm) below the mark placed on the wall in Step 2.

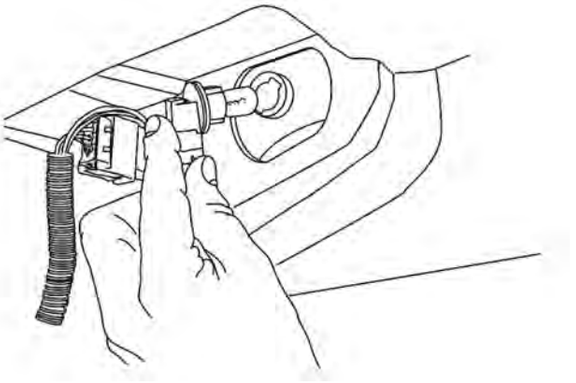
   NOTE: Rider weight must be included on the seat. On machines with separate low beam lights, the drop should be 8, (20.3 cm) in 25' from the center of the low beam lamp.

5. Adjust beam to desired position.

Lower Headlamp Removal / Installation

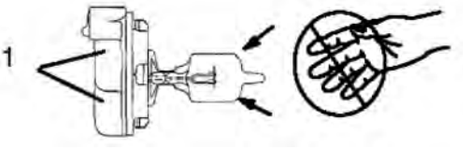


1. Turn the back of the headlamp harness in a counter-clockwise direction to loosen.
2. Pull the harness assembly out from the headlight assembly.



3. Remove the lamp and replace with a new headlamp.

   NOTE: Do not touch the new lamp with bare fingers. Hold the plastic part (1) of the lamp. Oil from your skin leaves a residue, causing a hot spot that will shorten the life of the lamp.



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4. Install the harness assembly into the headlight assembly. Turn the headlight harness clockwise to secure the headlamp into place.

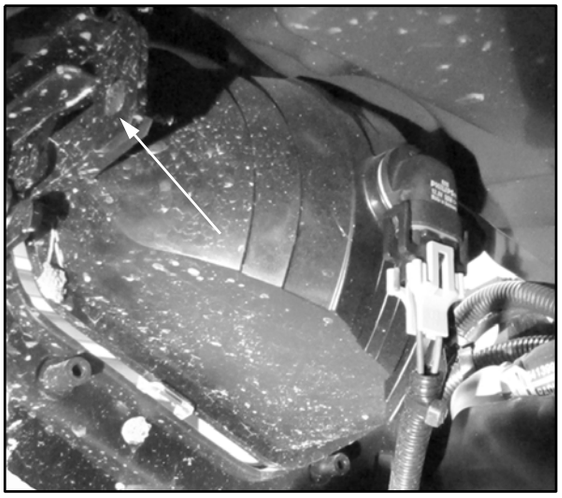
Lower Headlamp Housing Removal (if required)

5. Remove the upper and lower portion of the front bumper as outlined in chapter 5.
6. Remove the screw that secures the lower headlamp.

7. Remove retaining O-ring from inner headlamp mount.
8. Pull the headlamp out of the locking tab.

Low Beam Headlight Adjustment (Non Intl)

1. The low beam can be adjusted slightly upward or downward.

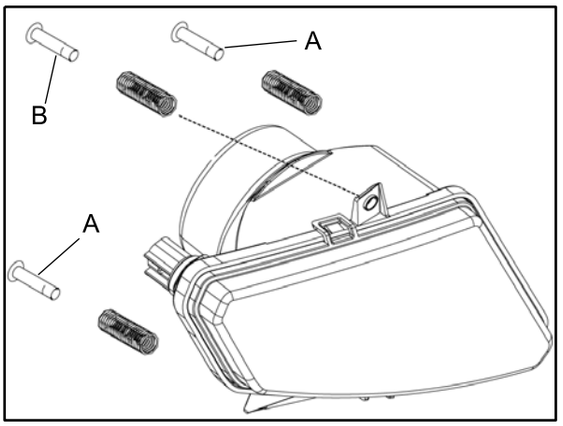


2. Loosen the phillips screw located at the rear of the headlamp.
3. Tilt the headlamp upward or downward.
4. Tighten the screw.

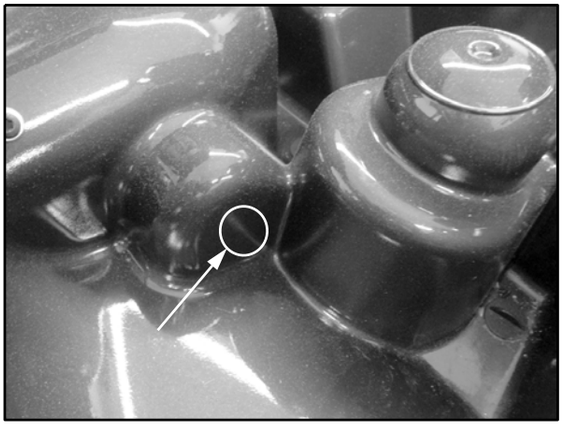
Lower Headlight Adjustment (Forest)

NOTE: The following procedure may be needed on some international units.

1. The bottom two headlight mounting screws / adjusters (A) can be access directly through the fender openings.
2. The single upper headlight mounting screw / adjuster (B) is only accessible after a .55” (14mm) hole is drilled into the front cab.



3. Drill a .55” (14mm) hole in the center of the boss as indicated below to access the upper mounting / adjustment screw.



4. Adjust the beam to the desired position by loosening or tightening the (3) T-25 adjustment / mounting screws.

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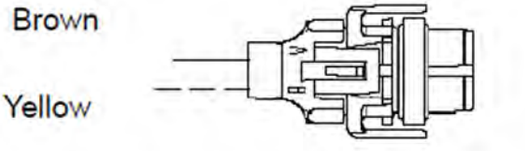
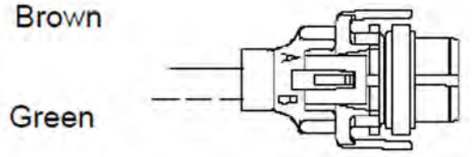
5. Once the adjustment is completed, plug the .55” (14mm) access hole with a compartment plug (PN 5412981).
6. Repeat procedure to adjust the other lower headlight.

Headlamp Switch Test

1. Remove the headlight pod cover.
2. Set meter to DC Volts and probe the headlamp plug wires (Brown and Yellow) at back of connector for 12 Volts.
3. Turn ignition and headlight on. If there is no power, continue with checks to the harness and fuses.

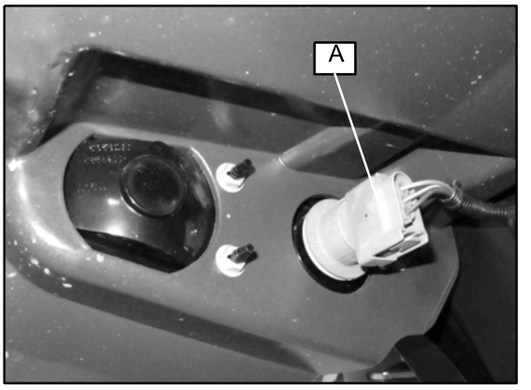


Upper Headlamp Plug Wires

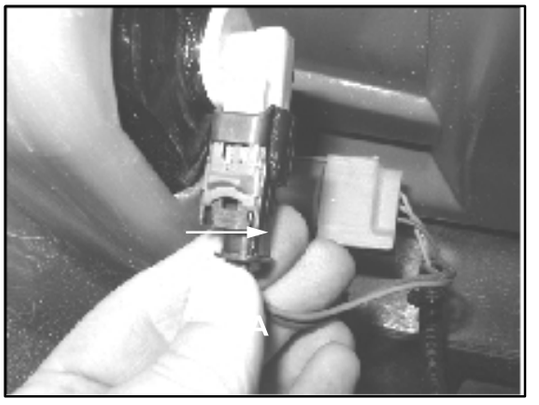


Brake Light Replacement

The brake light (A) is located in the rear tail lamp housing.



1. To remove the brake light electrical connector (A) , press in on the tab on the connector to unlock the connector and pull the connector from the bulb assembly.



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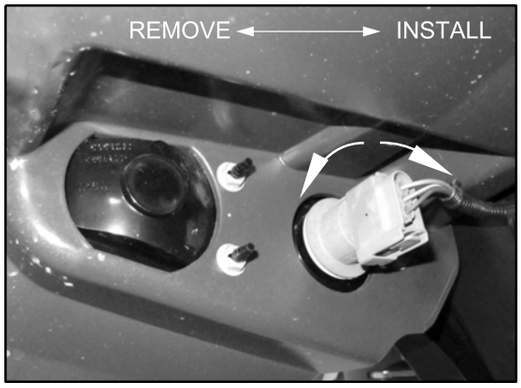
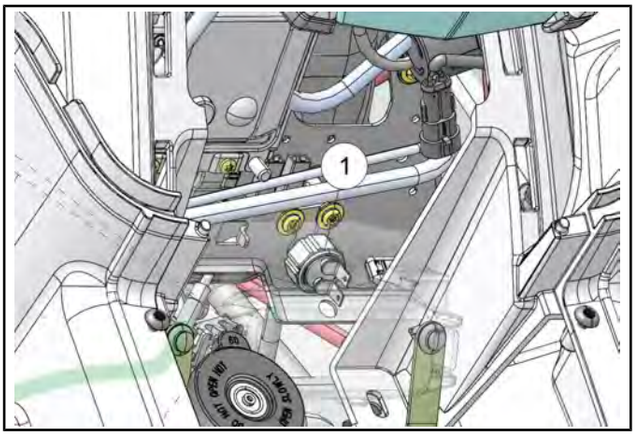
2. To replace either of the bulbs, turn the holder assembly counter-clockwise to remove and pull out. Turn the holder assembly clockwise to install. Refer to the parts manual for the correct bulb part number.



Brake Light Switch

1. Disconnect battery.
2. Remove the front rack.
3. Remove the front cover.
   The brake pressure switch is located below the ecu. THe vehicle wiring harness will need to be pushed to the side to gain access.



4. Disconnect wire harness from switch.
5. Connect an ohmmeter across switch contacts. Reading should be infinite (OL).
6. Apply brake at handlebar lever and check for continuity between switch contacts. Replace switch if there is no continuity or greater than .5 ohms resistance when the brake is applied with slight pressure.

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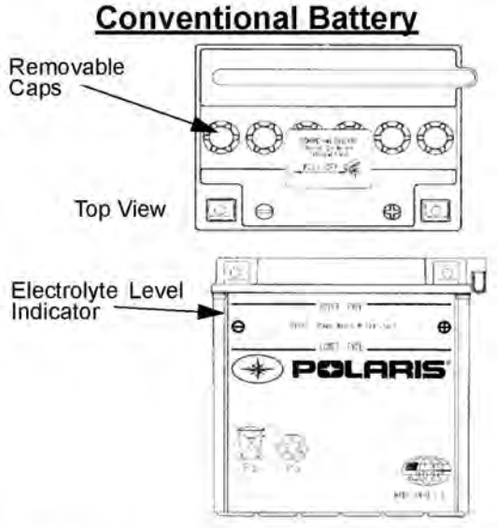
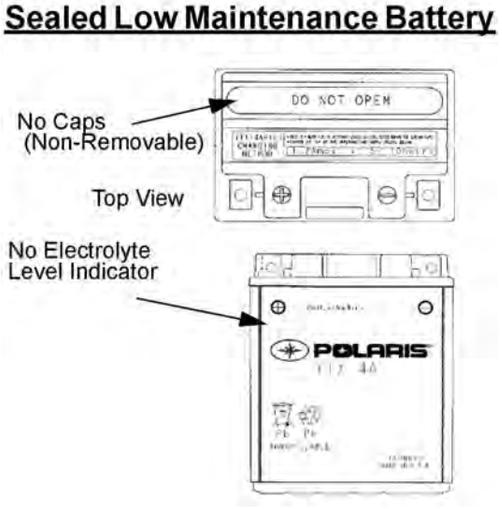
BATTERY

Battery Identification

NOTE: It is important to identify what type of battery you have installed in your ATV. Different types of batteries require different service procedures. Proper servicing and upkeep of your battery is very important for maintaining long battery life.

Your ATV may have a Conventional Battery or a Sealed Low Maintenance Battery. To identify which type of battery your ATV has, refer to the illustration below and follow the correct service and charging procedures that follow in the manual.





Battery Conductance Analyzer

Conductance describes the ability of a battery to conduct current. A conductance tester functions by sending a low frequency AC signal through the battery and a portion of the current response is captured, from this output a conductance measurement is calculated. Conductance testing is more accurate than voltage, specific gravity, or load testing.

Authorized Polaris dealers/distributors are required to use the conductance analyzer when testing 12V Polaris batteries.

Polaris MDX-610P
Conductance Analyzer

Polaris MDX-610P
SPX PN: PU-50296

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Battery Activation (Conventional)

WARNING

Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing. Antidote:

External: Flush with water.
Internal: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN.

WARNING

The gases given off by a battery are explosive. Any spark or open flame near a battery can cause an explosion which will spray battery acid on anyone close to it. Should there be contact with battery acid, wash the affected area with large quantities of cool water and seek immediate medical attention.

WARNING

CALIFORNIA PROPOSITION 65 WARNING: Batteries, battery posts, terminals and related accessories contain lead and lead compounds, and other chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. WASH HANDS AFTER HANDLING.

To ensure maximum service life and performance from a new battery, perform the following steps.

NOTE: Do not service the battery unless it will be put into regular service within 30 days. After initial service, add only distilled water to the battery. Never add electrolyte after a battery has been in service.
New Battery: Battery must be fully charged before use or battery life will be significantly reduced 10-30% of the battery's full potential.

To activate a new battery:

1. Remove vent plug from vent fitting. Remove cell caps.
2. Fill battery with electrolyte to upper level marks on case.
3. Set battery aside to allow for acid absorption and stabilization for 30 minutes.
4. Add electrolyte to bring level back to upper level mark on case.

   NOTE: This is the last time that electrolyte should be added. If the level becomes low after this point, add only distilled water.

5. Charge battery at 1/10 of its amp/hour rating. Examples: 1/10 of 9 amp battery = .9 amp; 1/10 of 14 amp battery = 1.4 amp; 1/10 of 18 amp battery = 1.8 amp (recommended charging rates).
6. Check specific gravity of each cell with a hydrometer to assure each has a reading of 1.270 or higher.

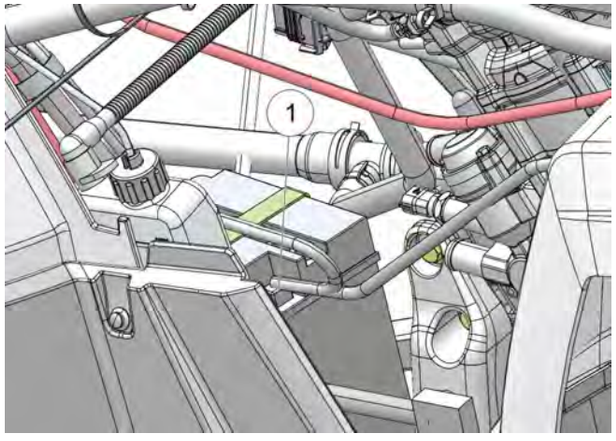
Battery Terminals/Bolts

Terminal Preparation

Use Polaris corrosion resistant Nyogel® grease (PN 2871329) on battery bolts and terminals when installing a battery. This will help to prevent corrosion and maintain good electrical connection. See “BATTERY INSTALLATION”.

Conventional Battery Inspection / Removal

The battery is located on LH front side of the vehicle, on the skid plate inside the fender ad left side panel.



Inspect the battery fluid level. When the battery fluid nears the lower level, remove the battery and fill with *distilled water only* to the upper level line. To remove the battery:

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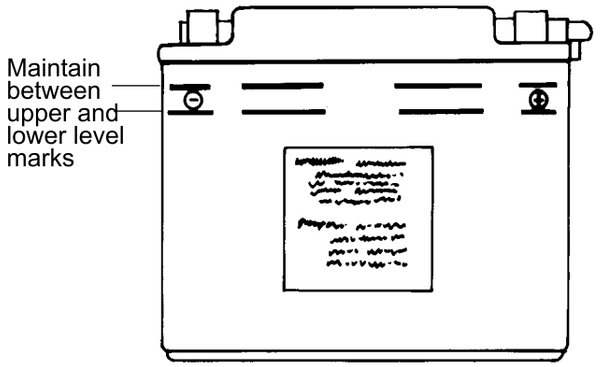

1. Disconnect holder strap and remove covers.
2. Disconnect battery negative (-) (black) cable first, followed by the positive (+) (red) cable.

CAUTION

Whenever removing or reinstalling the battery, disconnect the negative (black) cable first and reinstall the negative cable last!

3. Remove the battery.
4. Remove the filler caps and add distilled water only as needed to bring each cell to the proper level. Do not overfill the battery.

   NOTE: Refill using only distilled water. Tap water contains minerals which are harmful to a battery.

   Do not allow cleaning solution or tap water inside the battery. Battery life may be reduced.

5. Reinstall the battery caps.

Conventional Battery Installation

1. Clean battery cables and terminals with a stiff wire brush. Corrosion can be removed using a solution of one cup water and one tablespoon baking soda. Rinse well with clean water and dry thoroughly.
2. Route the cables correctly.
3. Reinstall battery, attaching positive (+) (red) cable first and then the negative (-) (black) cable. Coat terminals and bolt threads with Nyogel® Grease (PN 2871329).
4. Install clear battery vent tube from vehicle to battery vent. (if equipped).

WARNING

Vent tube must be free from obstructions and kinks and securely installed. If not, battery gases could accumulate and cause an explosion. The vent tube should be routed away from frame and body to prevent contact with Route the cables correctly.

5. Reinstall the holder strap.

Conventional Battery Testing

Whenever a service complaint is related to either the starting or charging systems, the battery should be checked first.

Following are three tests which can easily be made on a battery to determine its condition: OCV Test, Specific Gravity Test and Load Test.

Conventional Battery OCV - Open Circuit Voltage Test

Battery voltage should be checked with a digital multitester. Readings of 12.6 volts or less require further battery testing and charging. See charts and Load Test below.

NOTE: Lead-acid batteries should be kept at or near a full charge as possible. Electrolyte level should be kept between the low and full marks. If the battery is stored or used in a partially charged condition, or with low electrolyte levels, hard crystal sulfation will form on the plates, reducing the efficiency and service life of the battery.

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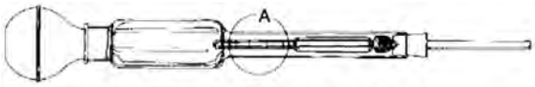
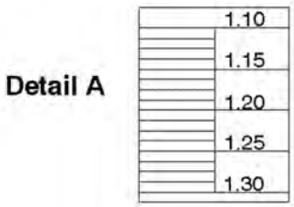
Conventional Battery Specific Gravity Test

A tool such as a Battery Hydrometer (PN 2870836) can be used to measure electrolyte strength or specific gravity. As the battery goes through the charge/discharge cycle, the electrolyte goes from a heavy (more acidic) state at full charge to a light (more water) state when discharged. The hydrometer can measure state of charge and differences between cells in a multi-cell battery. Readings of 1.270 or greater should be observed in a fully charged battery. Differences of more than .025 between the lowest and highest cell readings indicate a need to replace the battery.



Battery Hydrometer (**PN 2870836**)



STATE OF CHARGE	CONVENTIONAL LEAD - ACID	LOW MAINTE-NANCE
100%	12.60V	12.70V
Charged	12.40V	12.50V
75% Charged	12.10V	12.20V
50% Charged	11.90V	12.0V
25% Charged	less than 11.80V	Less than 11.90V
0% Charged	–	–

STATE OF CHARGE*	CONVENTIONAL LEAD - ACID	LOW MAINTENANCE
100%	1.265	1.275
Charged	1.210	1.225
75% Charged	1.160	1.175
50% Charged	1.120	1.135
25% Charged	less than 1.100	Less than 1.115
0% Charged	–	–

* Measurement at 80° F

NOTE: Subtract .01 from the specific gravity reading at 40° F

Battery Load Test

CAUTION

To prevent shock or component damage, remove spark plug high tension leads and connect securely to engine ground before proceeding.

NOTE: This test can only be performed on machines with electric starters. This test cannot be performed with an engine or starting system that is not working properly.

A battery may indicate a full charge condition in the OCV test and the specific gravity test, but still may not have the storage capacity necessary to properly function in the electrical system. For this reason, a battery capacity or load test should be conducted whenever poor battery performance is encountered. To perform this test, hook a multitester to the battery in the same manner as was done in the OCV test. The reading should be 12.6 volts or greater. Engage the starter and observe the battery voltage while cranking the engine. Continue the test for 15 seconds. During cranking the observed voltage should not drop below 9.5 volts. If the beginning voltage is 12.6 volts or higher and the cranking voltage drops below 9.5 volts during the test, replace the battery.

Off Season Storage

To prevent battery damage during extended periods of non-use, the following basic battery maintenance items must be performed:

- Remove the battery from the machine and wash the case and battery tray with a mild solution of baking soda and water. Rinse with lots of fresh water after cleaning. **NOTE:** Do not get any of the baking soda into the battery or the acid will be neutralized.
- Using a wire brush or knife, remove any corrosion from the cables and terminals.
- Make sure that the electrolyte is at the proper level. Add distilled water if necessary.
- Charge at a rate no greater than 1/10 of the battery's amp/hr capacity until the electrolyte's specific gravity reaches 1.270 or greater.
- Store the battery either in the machine with the cables disconnected, or store in a cool place.

  NOTE: Recharge to full capacity every 30 to 60 days during a non-use period. If the battery is stored during the winter months, electrolyte will freeze at higher temperatures as the battery discharges. The chart below indicates freezing points by specific gravity.

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SPECIFIC GRAVITY OF ELECTROLYTE	FREEZING POINT
1.265	-75° F
1.225	-35° F
1.200	-17° F
1.150	+5° F
1.100	+18° F
1.050	+27° F

Charging Procedure

1. Remove the battery from the ATV to prevent damage from leaking or spilled acid during charging.
2. Charge the battery with a charging output no larger than 1/10 of the battery's amp/hr rating. Charge as needed to raise the specific gravity to 1.270 or greater.
3. Install battery in vehicle with positive terminal toward the front. Coat threads of battery bolt with a corrosion resistant dielectric grease (**PN 2871329**).
4. Connect battery cables.

⚠ WARNING

To avoid the possibility of explosion, connect positive (red) cable first and negative (black) cable last.

5. After connecting the battery cables, install the cover on the battery and attach the hold down strap.
6. Install clear battery vent tube from vehicle to battery vent.

⚠ WARNING

Vent tube must be free from obstructions and kinks and securely installed. If not, battery gases could accumulate and cause an explosion. Vent should be routed away from frame and body to prevent contact with electrolyte. Avoid skin contact with electrolyte, as severe burns could result.
If electrolyte contacts the vehicle frame, corrosion will occur.

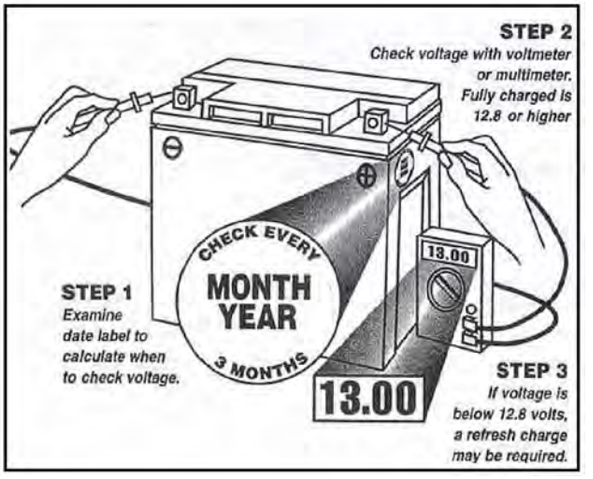
7. Route cables so they are tucked away in front and behind battery.

Low Maintenance Battery

Battery Check:

NOTE: All Low Maintenance batteries are fully charged and tested at the factory before installation. Expected shelf life varies on storage conditions. As a general rule before placing the battery into service, check the battery condition and charge accordingly.

1. Check the date label on the side of the battery to calculate when to check voltage. The battery should be checked every 3 months.
2. Check the voltage with a voltmeter or multimeter. **A fully charged battery should be 12.8 V or higher.**
3. If the voltage is below 12.8 V, the battery will need to be recharged.



NEW BATTERIES: Batteries must be fully charged before use or battery life can be reduced by 10-30% of full potential. Charge battery for 3-5 hours using a variable rate charger. Do not use the alternator to charge a new battery. A high rate battery charger can cause battery damage.

Low Maintenance batteries are permanently sealed at the time of manufacture. The use of lead-calcium and AGM technology instead of lead-antimony allows the battery acid to be fully absorbed. For this reason, a Low Maintenance battery case is dark and the cell caps are not removable, since there is no need to check electrolyte level.

NEVER attempt to add electrolyte or water to a Low Maintenance battery. Doing so will damage the case and shorten the life of the battery. Refer to the Battery Activation and Maintenance Video (**PN 9917987**) for proper instruction on servicing Low Maintenance batteries.

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NOTE: New Batteries: Batteries must be fully charged before use or battery life will be reduced by 10-30% of full potential. Charge battery for 3-5 hours at a current equivalent of 1/10 of the battery's rated amp/hour capacity. Do not use the alternator to charge a new battery. (Refer to Battery Activation and Maintenance video PN 9917987)

NEVER attempt to add electrolyte or water to a Low Maintenance battery. Doing so will damage the case and shorten the life of the battery. Refer to the Battery Maintenance Video (**PN 9917987**) for proper instruction on servicing Low Maintenance batteries.

TO SERVICE A LOW MAINTENANCE BATTERY:

1. Remove battery from the vehicle.
2. Test battery with a voltage meter or load tester to determine battery condition. This will determine the length of time required to charge the battery to full capacity. Refer to capacity table.
3. Charge battery using a variable rate charger.

Low Maintenance Battery Charging

If battery voltage is 12.8 V or less, the battery may need recharging. When using an automatic charger, refer to the charger manufacturer's instructions for recharging. When using a constant current charger, use the following guidelines for recharging.

NOTE: Always verify battery condition before and 1-2 hours after the end of charging.

⚠ WARNING

An overheated battery could explode, causing severe injury or death. Always watch charging times carefully. Stop charging if the battery becomes very warm to the touch. Allow it to cool before resuming charging.

STATE OF CHARGE	VOLTAGE	ACTION	CHARGE TIME
100%	12.8-13 V	None, check voltage at 3 mos. after manufacture date	None Required
75-100%	12.5-12.8 V	May need slight charge	3-6 Hours
50-75%	12.0-12.5 V	Needs Charge	5-11 Hours
25-50%	11.5-12.0 V	Needs Charge	At least 13 hours, verify state of charge
0-25%	11.5 V or less	Needs Charge	At least 20 hours

Low Maintenance Battery Inspection / Removal

The battery is located on the rear, left-side of the frame.

1. Remove the seat and Disconnect holder strap.
2. Disconnect battery negative (-) (black) cable first, followed by the positive (+) (red) cable.

⚠ CAUTION

Whenever removing or reinstalling the battery, disconnect the negative (black) cable first and reinstall the negative cable last!

3. Remove the battery.

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Low Maintenance Battery Installation

1. Clean battery cables and terminals with a stiff wire brush. Corrosion can be removed using a solution of one cup water and one tablespoon baking soda. Rinse well with clean water and dry thoroughly.
2. Route the cables correctly.
3. Reinstall battery, attaching positive (+) (red) cable first and then the negative (-) (black) cable. Coat terminals and bolt threads with Nyogel® Grease (**PN 2871329**).
4. Reinstall the holder strap.

Low Maintenance Battery - OCV- Open Circuit Voltage Test

Battery voltage should be checked with a digital multitester. Readings of 12.8 volts or less require further battery testing and charging. See charts and Load Test.

NOTE: Lead-acid batteries should be kept at or near a full charge as possible. If the battery is stored or used in a partially charged condition, or with low electrolyte levels, hard crystal sulfation will form on the plates, reducing the efficiency and service life of the battery.

Use a voltmeter or multimeter to test battery voltage.

STATE OF CHARGE	LOW MAINTENANCE BATTERY	CONVENTIONAL BATTERY
100 %	13.0V	12.70V
75% Charged	12.80V	12.50V
50%	12.50V	12.20V
25%	12.20V	12.0V
0% Charged	less than 12.0V	less than 11.9V

* Measurement at 80° F

NOTE: Subtract .01 from the specific gravity reading at 40° F.

Low Maintenance Battery Load Test

CAUTION

To prevent shock or component damage, remove spark plug high tension leads and connect securely to engine ground before proceeding.

NOTE: This test can only be performed on machines with electric starters. This test cannot be performed with an engine or starting system that is not working properly.

A battery may indicate a full charge condition in the OCV test and the specific gravity test, but still may not have the storage capacity necessary to properly function in the electrical system. For this reason, a battery capacity or load test should be conducted whenever poor battery performance is encountered. To perform this test:

1. Hook a multitester to the battery in the same manner as was done in the OCV test. The reading should be 12.8 volts or greater.
2. Engage the starter and observe the battery voltage while cranking the engine. Continue the test for 15 seconds.
3. During cranking the observed voltage should not drop below 9.5 volts.
4. If the beginning voltage is 12.8 volts or higher and the cranking voltage drops below 9.5 volts during the test, replace the battery.

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Low Maintenance Battery Charging Procedure

1. Remove the battery from the ATV to prevent damage from leaking or spilled acid during charging.
2. Charge the battery with a variable rate charging output. Charge as needed to raise the specific gravity to 1.270 or greater.
3. Install battery in vehicle with positive terminal toward the front. Coat threads of battery bolt with a corrosion resistant Nyogel® Grease (**PN 2871329**).
4. Route cables so they are tucked away in front and behind battery.
5. Connect battery cables.

⚠ WARNING

To avoid the possibility of sparks and explosion, connect positive (red) cable first and negative (black) cable last.

6. After connecting the battery cables, install the cover on the battery and attach the hold down strap.

Low Maintenance Battery Off-season Storage

Battery voltage should be checked with a digital multitester. Readings of 12.8 volts or less require further battery testing and charging. See charts and Load Test.

- Remove the battery from the machine and wash the case and battery tray with a mild solution of baking soda and water. Rinse with lots of fresh water after cleaning.
- Using a wire brush or knife, remove any corrosion from the cables and terminals.
- Make sure that the electrolyte is at the proper level.
- Charge at a rate no greater than 1/10 of the battery's amp/hr capacity until the electrolyte's specific gravity reaches 1.270 or greater.
- Store the battery either in the machine with the cables disconnected, or store in a cool place.

  NOTE: Stored batteries lose their charge at the rate of 1% per day. Recharge to full capacity every 30 to 60 days during a non-use period. If the battery is stored during the winter months, electrolyte will freeze at higher temperatures as the battery discharges. The chart below indicates freezing points by specific gravity.

SPECIFIC GRAVITY OF ELECTROLYTE	FREEZING POINT
1.265	-75° F
1.225	-35° F
1.200	-17° F
1.150	+5° F
1.100	+18° F
1.050	+27° F

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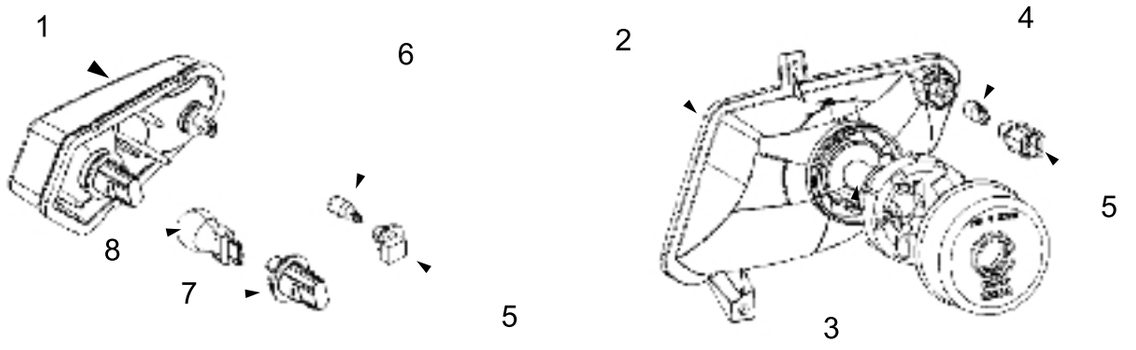
SPORTSMAN 570 EFI FOREST ELECTRICAL

Head Lamps / Tail Lamps - Exploded View



REF #	DESCRIPTION	QTY		REF #	DESCRIPTION	QTY
1	Stop, Tail, Turn lamp Housing Asm	1		5	1/4 Turn Socket	2
2	Head lamp Housing Asm	1		6	Turn Bulb	2
3	35W Head Lamp	2		7	Tail lamp Socket	2
4	Position Lamp	2		8	Tail / Stop Lamp	2

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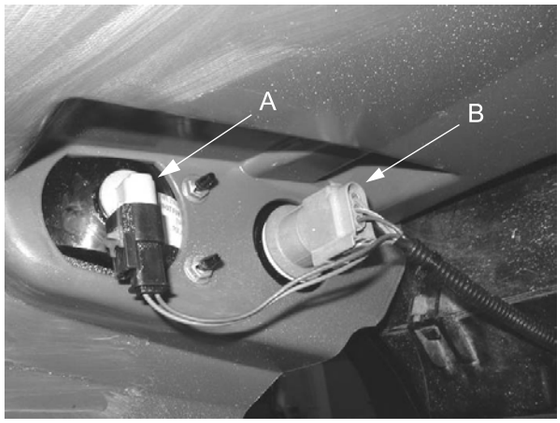
Hazard / Flasher Module

The flasher module functions directly from the battery supply. Hazard lights are functional regardless if the ignition is on or off. Switching the flash output to left or right side turn signals will flash the lights accordingly. The hazard terminal is designed for a SPST switch to connect it to the flash output. Closing this switch will connect the flasher driver output to both left and right turn signal lights via two diodes. While the ignition is on, the flash driver will be toggling on and off regardless of turn or hazard switch position. If ignition is off, the flasher driver will remain off until a lamp load is connected (turn or hazards on) to reduce current draw. Two or more lamps connected to the flash output will flash at the normal rate in turn or hazard mode. The flash rate will double when a single lamp is detected on the flash output in turn or hazard mode.

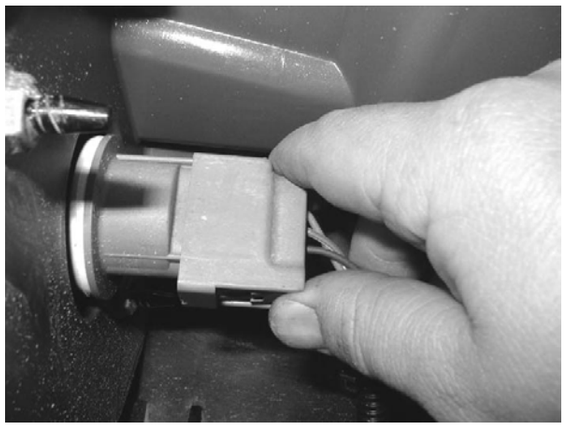
Rear Tail Lamp / Turn Signal Lamp Replacement

The turn lamp (A) and the tail lamp (B) are both located in the rear lamp housing.



1. To remove the turn lamp electrical connector (A), pull down on the connector lock and pull the connector from the bulb assembly.

2. To remove the tail lamp electrical connector (B), press in on the tab on the connector to unlock the connector and pull the connector from the bulb assembly.



3. To exchange either of the bulbs, turn the housing 1/4 turn counter-clockwise to remove and install. Turn the housing clockwise to install.

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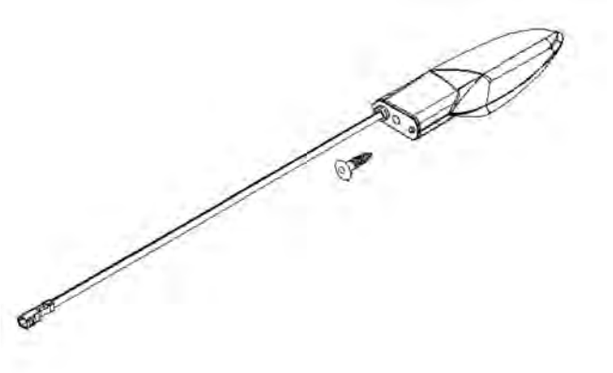
Front Turn Signal Lamp Replacement

The front blinkers are non serviceable.

1. Remove the screw retaining the front turn signal assembly.

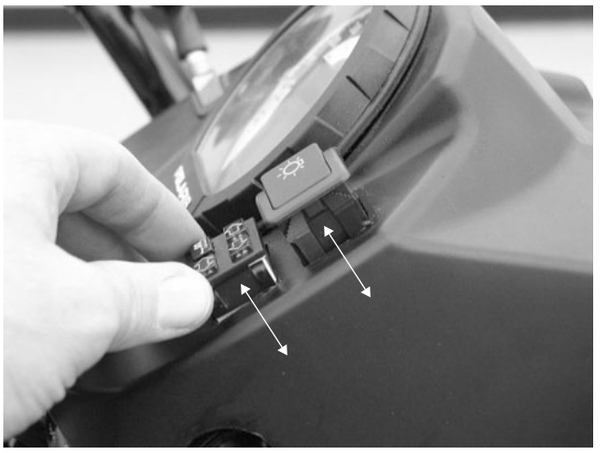


2. Test the new light assembly.
3. Install the screws and tighten sufficiently.

Pod Indicator Lamp / Switch Replacement

1. Remove the screws from the pod assembly and lift the upper pod off.

2. Disconnect the wiring harness of the assembly you wish to replace.



3. Press the retainer tabs using your fingers or a pliers and push the assembly out of the housing.
4. Insert a new assembly into the corresponding opening and install the harness.
5. Install the upper pod, screws and tighten sufficiently.

Speed Control

The speed control system utilizes the ECU, Speed Sensor, Solenoid Valve, and engine vacuum from the throttle body to operate. The ECU powers the system through the ECU/IGN/FUEL Relay. When the speed sensor signal rises over 40 Kph (25 Mph), the ECU triggers the solenoid valve to open, allowing atmospheric pressure on top of the air control body diaphragm which limits the amount of air entering the engine. Once the vehicle speed drops below 37-40 Kph (23-25 Mph), the solenoid valve is closed by the ECU and the operation repeats. Should the vehicle speed reach 67 Kph (42 Mph), the ‘check engine’ light will illuminate on the LCD gauge to indicate there is a problem with the system.

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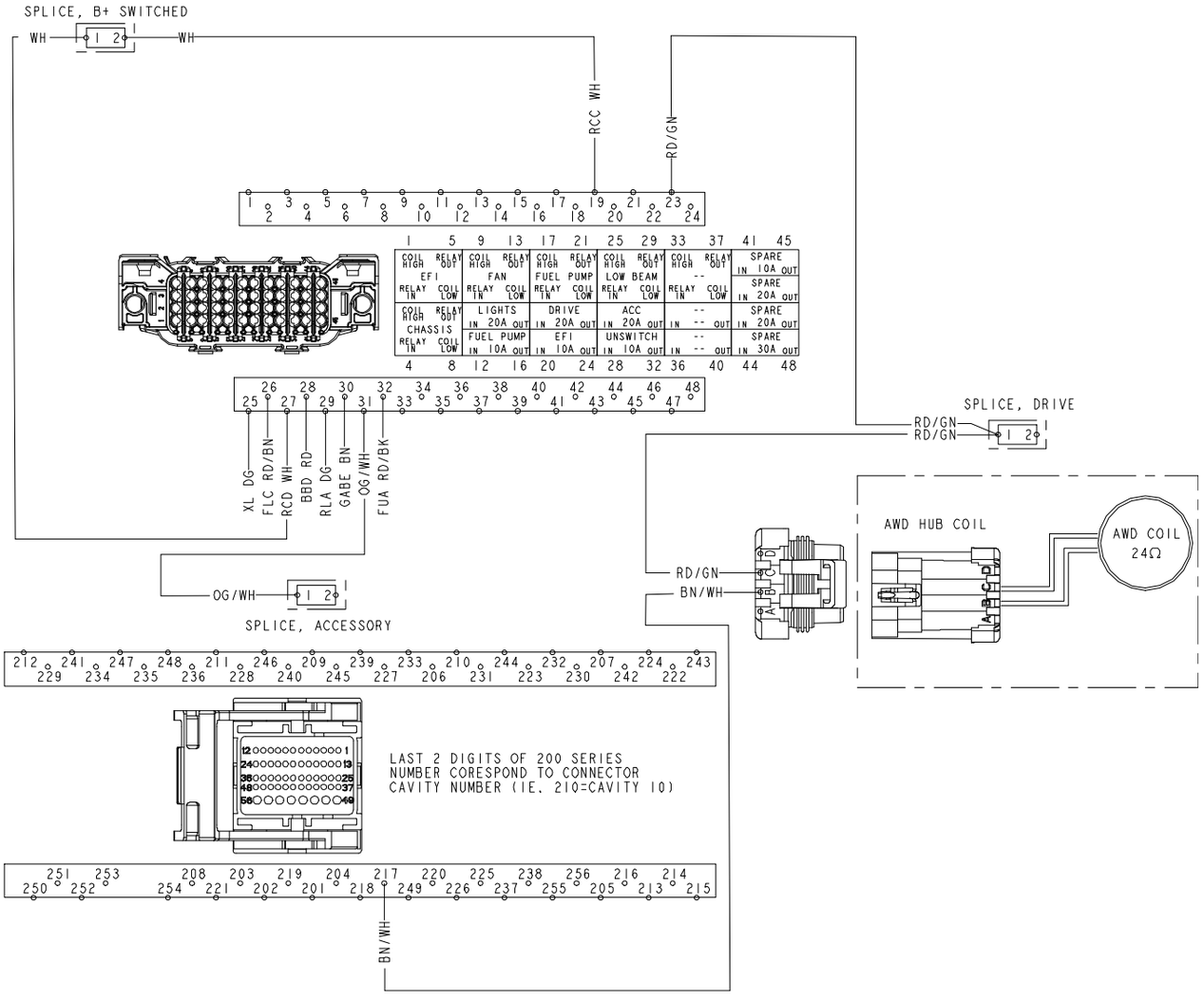
TROUBLESHOOTING DIAGRAMS

All Wheel Drive-



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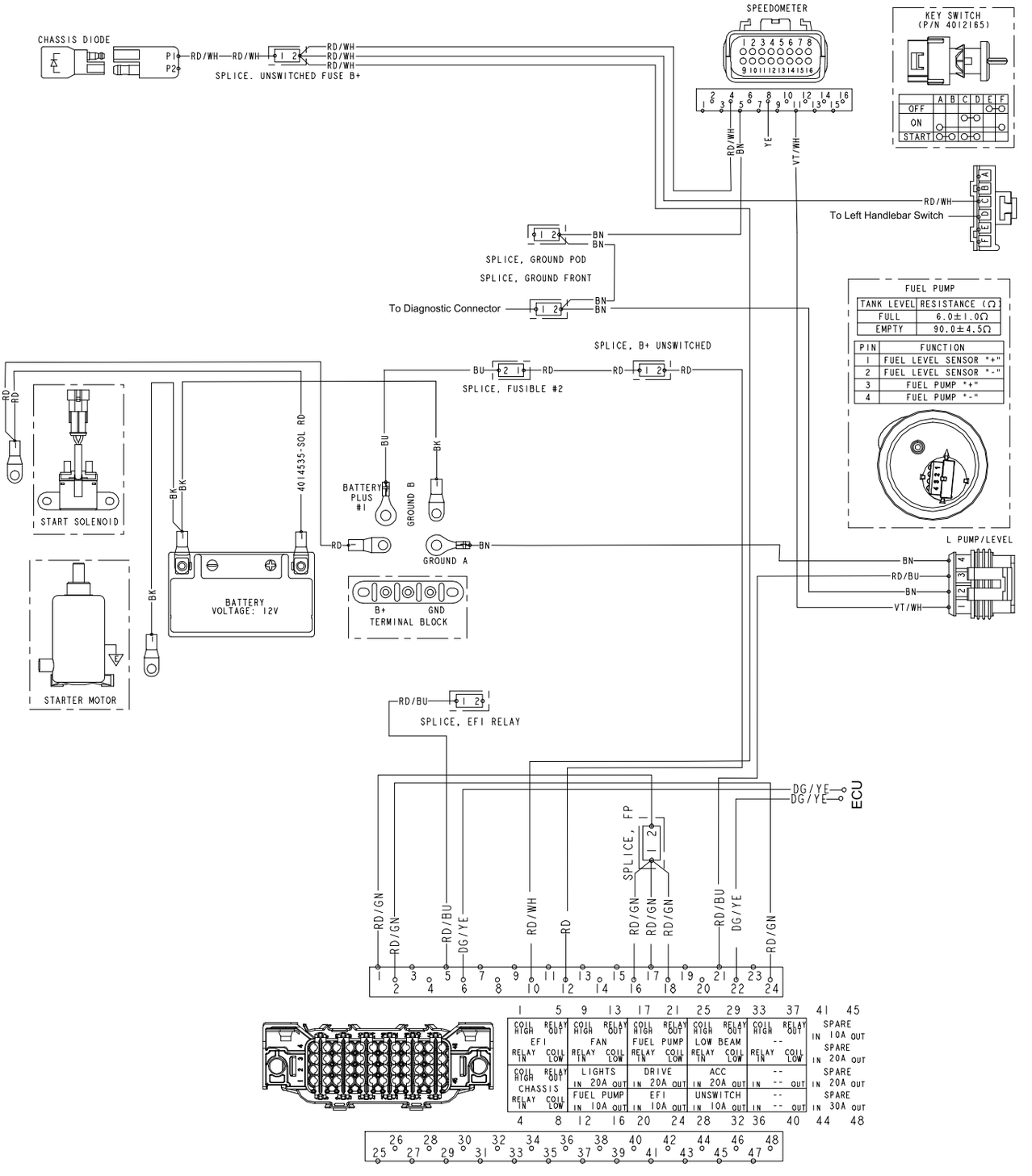
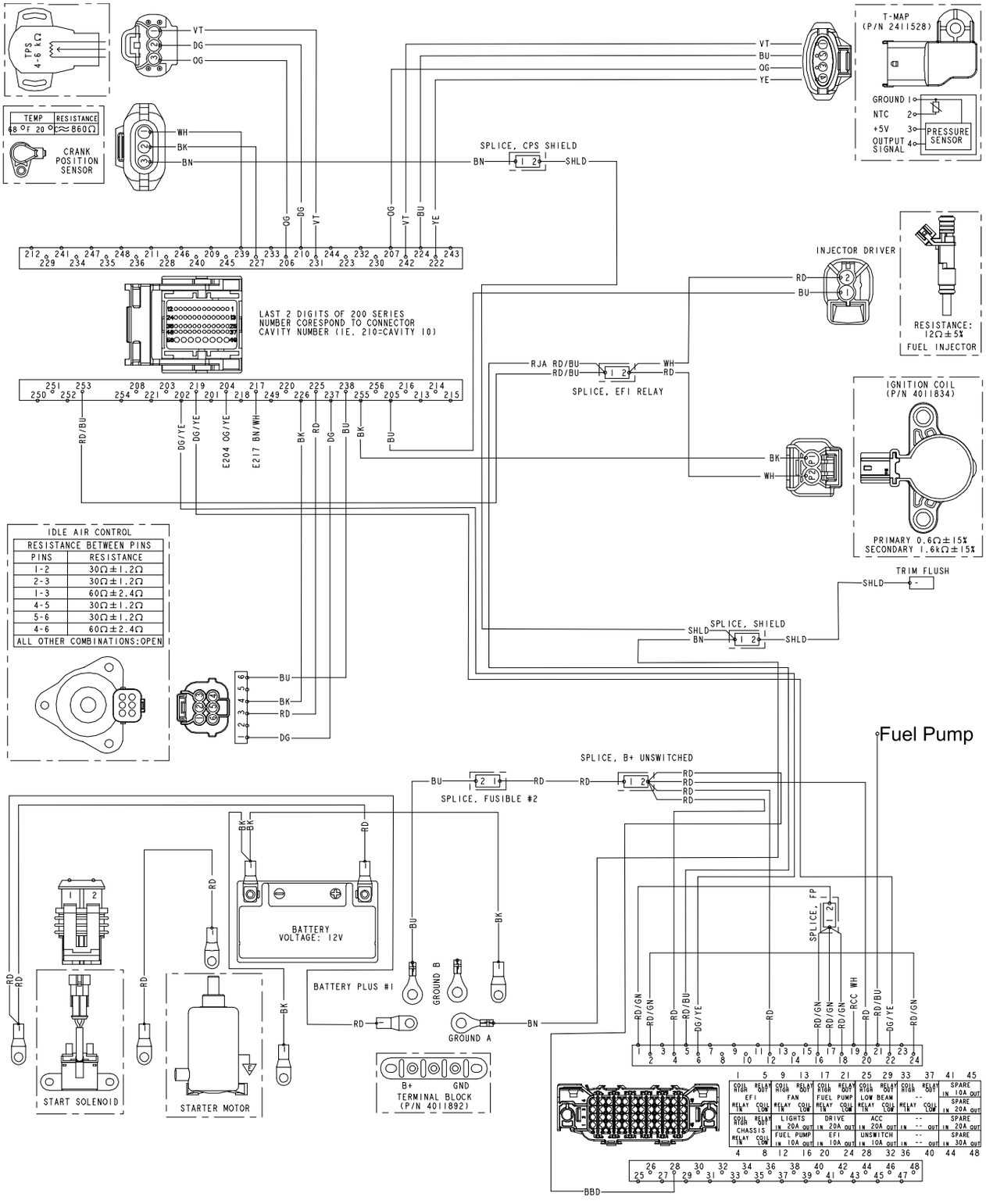
Fuel Pump-



Fuel Injection-



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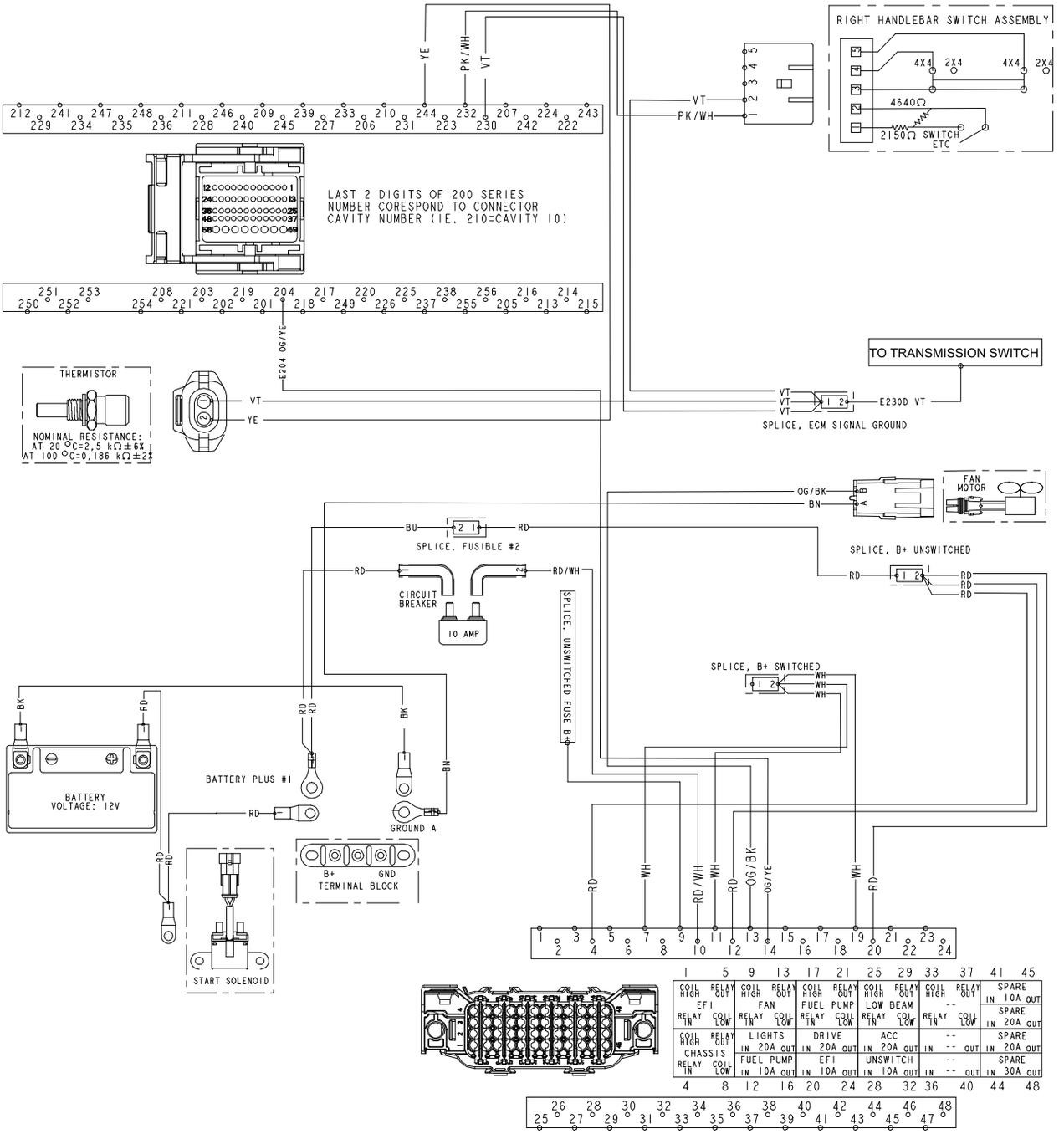
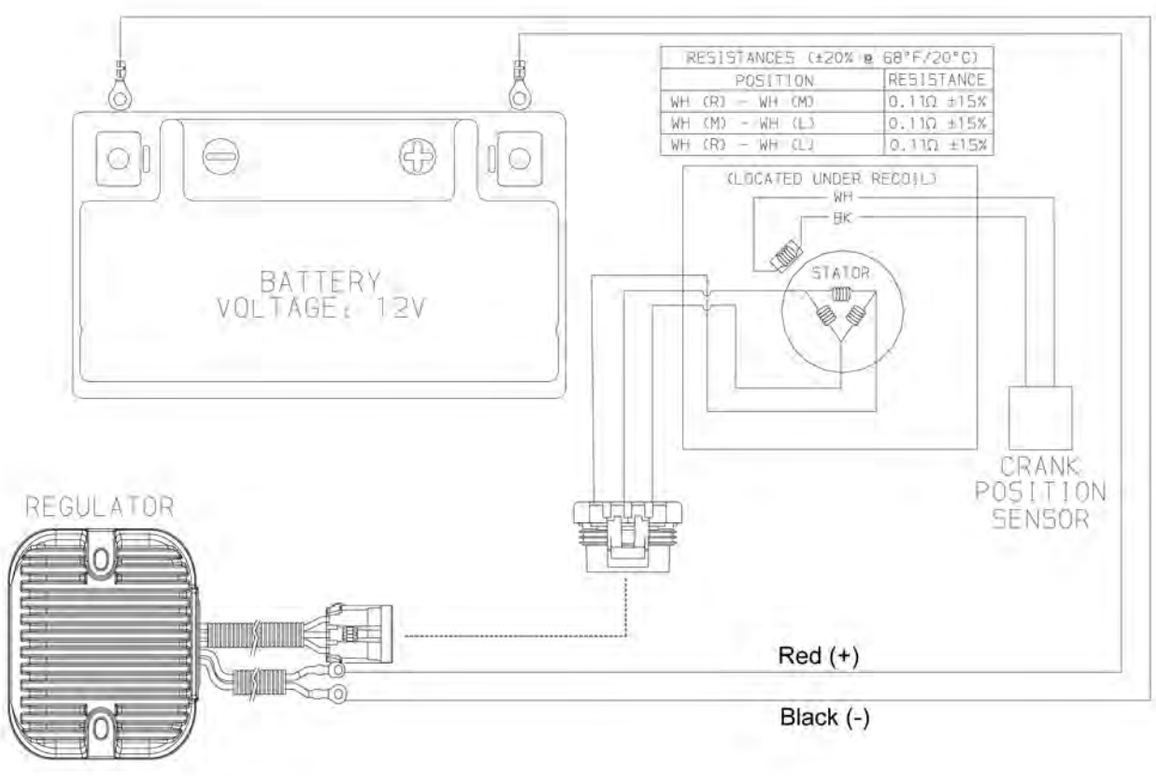
Fan Control-



Charging System-



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NOTES

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A

B

C

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D

E

F

G

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I

K

L

M

O

P

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U

V

W

HARNESS-MAIN,SPMN 570

WIRE COLOR LEGEND	
BK	BLACK (TAN)
BN	BROWN
BU	LIGHT BLUE
DB	DARK BLUE
GN	GREEN
OG	ORANGE
PK	PINK
RD	RED
VB	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CR	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN TRACE COLOR/STRIPE COLOR. EXAMPLE: BK/YE = RED WITH YELLOW STRIPE.

▽ = ENGINE GROUND

▽ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

DIAGNOSTIC

WINCH SWITCH

BULKHEAD ACCESSORY 1 B+

BULKHEAD ACCESSORY 2 B+

LH HEADLIGHT (P/N 2410615) (HEADLIGHT BULB SERVICE P/N 4010553)

POD LIGHT P/N 2410614

SPEEDOMETER

RH HEADLIGHT (P/N 2410616) (HEADLIGHT BULB SERVICE P/N 4010253)

RIGHT HANDLEBAR SWITCH ASSEMBLY

KEY SWITCH (P/N 4012163)

LEFT HANDLEBAR SWITCH ASSEMBLY (P/N 4011835)

HEADLAMP

RUN

OVERRIDE

SPEEDO/ ENGINE OVERRIDE

LHC CONN A

LHC CONN B

POD ACC GROUND

12V RECEPTACLE (P/N 4014038)

POD ACC B+

SPLICE, ACCESSORY

SPLICE, GROUND POD

SPLICE, GROUND FRONT

SPLICE, HIGH BEAM

SPLICE, CAN LOW

SPLICE, CAN HIGH

SPLICE, B+ UNSWITCHED

SPLICE, B+ SWITCHED

SPLICE, LOW BEAM

SPLICE, LIGHTS B+

SPLICE, UNSWITCHED FUSE B+

CHASSIS DIODE (P/N 2410000)

SPLICE, R/S B+

SPLICE, DRIVE

FUEL PUMP

TANK LEVEL	RESISTANCE (Ω)
FULL	6.0±1.5Ω
(MPTY	90.0±4.5Ω

PIN	FUNCTION
1	FUEL LEVEL SENSOR "+"
2	FUEL LEVEL SENSOR "-"
3	FUEL PUMP "+"
4	FUEL PUMP "-"

FUEL PUMP/LEVEL

FAN MOTOR

AWD HUB COIL

AWD COIL 24Ω

THERMISTOR (P/N 4010644)

NOMINAL RESISTANCE: AT 20 °C±2.5 Ω12.0±5% AT 100 °C±0.184 kΩ±2.2%

T-MAP (P/N 2411528)

PRESSURE SENSOR

1 GROUND
2 NTC
3 +5V
4 OUTPUT SIGNAL

TPS (P/N 4010645)

IDLE AIR CONTROL

RESISTANCE BETWEEN PINS	
PINS	RESISTANCE
1-2	35Ω±8.1.2Ω
2-3	35Ω±8.1.2Ω
1-3	65Ω±2.4Ω
4-5	35Ω±8.1.2Ω
5-6	35Ω±8.1.2Ω
4-6	65Ω±2.4Ω

ALL OTHER COMBINATIONS:OPEN

CRANK POSITION SENSOR

TEMP	RESISTANCE
68 °F, 20 °C	2.5 kΩ
266 °F, 130 °C	186 Ω

SPLICE, CPS SHIELD

CIRCUIT BREAKER 10 AMP

P/N 2410892

SPLICE, SHIELD

SPLICE, EFI RELAY

SPLICE, FUSIBLE #2

BRAKE DIODE (P/N 2411035) 6A D100E

SPEED SENSOR (LOCATED ON TRANSMISSION)

HALL SENSOR

TRANSMISSION SWITCH P/N 7461999

SPLICE, ECM SIGNAL GROUND

SPLICE, GROUND REAR

IGNITION COIL (P/N 4011834)

PRIMARY R:0.42±.15Ω SECONDARY 7.46kΩ±15%

TRIM FLUSH

INJECTOR DRIVER

RESISTANCE: 12Ω±0.5Ω FUEL INJECTOR

BATTERY PLUS #1

BATTERY VOLTAGE: 12V

GROUND A

GROUND B

GND TERMINAL BLOCK (P/N 4013892)

BRAKE SWITCH ON JUNCTION BLOCK

LH TAILLIGHT (P/N 2411153) (TAILLIGHT SOCKET SERVICE P/N 4011101) (TAILLIGHT BULB SERVICE P/N 4012764)

RH TAILLIGHT (P/N 2411541) (TAILLIGHT SOCKET SERVICE P/N 4011101) (TAILLIGHT BULB SERVICE P/N 4012764)

START SOLENOID

STARTER MOTOR

STATOR (P/N 4013970) (FLYWHEEL P/N 4013969)

REGULATOR (4014543)

TO UNIT

TO BATTERY

LAST 2 DIGITS OF 200 SERIES NUMBER CONFORMS TO CONNECTOR CAVITY NUMBER (I.E. 210=CAVITY 10)

HARNESS-MAIN,SPMN 570

WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.

E = ENGINE GROUND

C = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
4014424-680	SGT	13.0	RD	SOLENOID B+	I	SOLENOID B+	I	TBD	1
4014535-SOL	SGT	13.0	RD	B+	I	B+	I	TBD	2
4014535-TB	SGT	13.0	RD	B+	I	B+	I	TBD	3
4014546-START	SGT	13.0	BK	GND	I	GND	I	TBD	4
4014546-TB	SGT	13.0	BK	GND	I	GND	I	TBD	5
BBA	FUSIBLE LINK	0.8	BU	BATTERY PLUS #1	I	SPLICE, FUSIBLE #2	2	UNSWITCHED,B+	6
BBB	TXL	2.0	RD	SPLICE, FUSIBLE #2	I	SPLICE, B+ UNSWITCHED	I	UNSWITCHED, B+	7
BBD	TXL	2.0	RD	SPLICE, B+ UNSWITCHED	2	LOAD CENTER	28	UNSWITCHED, B+	8
BBE	TXL	0.5	RD	SPLICE, B+ UNSWITCHED	2	LOAD CENTER	20	UNSWITCHED, B+	9
BBF	TXL	2.0	RD	SPLICE, B+ UNSWITCHED	2	LOAD CENTER	4	UNSWITCHED, B+	10
BBG	TXL	0.5	RD	SPLICE, B+ UNSWITCHED	2	LOAD CENTER	12	UNSWITCHED, B+	11
BCA	TXL	1.0	RD	BATTERY PLUS #1	I	FAN CKT BKR	I	UNSWITCHED, B+	12
CBA	TXL	1.0	RD/WH	FAN CKT BKR	2	LOAD CENTER	10	UNSWITCHED FUSED, B+	13
C_A227	TXL	0.5	BK	ECM	227	CRANK POSITION SENSOR	2	CRANK -	14
C_A239	TXL	0.5	WH	ECM	239	CRANK POSITION SENSOR	I	CRANK +	15
C_AC	SHLD	0.5	SHLD	SPLICE, SHIELD	I	SPLICE, CPS SHIELD	2	CRANK POSITION SENSOR SHIELD	16
C_B255	TXL	0.5	BK	ECM	255	IGNITION COIL	P1	MAG IGNITION CONTROL	17
C_BB	TXL	0.5	WH	SPLICE, EFI RELAY	2	IGNITION COIL	P2	PTO IGNITION CONTROL	18
C_BC	SHLD	0.35	SHLD	SPLICE, SHIELD	2	TRIM FLUSH	-	PRIMARY CABLE SHIELD	19
E202	TXL	0.5	DG/YE	ECM	202	LOAD CENTER	6	EFI RELAY COIL GROUND	20
E204	TXL	0.5	OG/YE	ECM	204	LOAD CENTER	14	FAN RELAY COIL GROUND	21
E205	TFE	0.5	BU	ECM	205	INJECTOR DRIVER	I	MAG INJECTOR CONTROL	22
E206	TFE	0.5	OG	ECM	206	TPS	3	5V TO TPS	23
E207	TFE	0.5	OG	ECM	207	TMAP	3	5V B+ MAP	24
E210	TFE	0.5	DG	TPS	2	ECM	210	TPS SIGNAL	25
E211	TXL	0.5	GY/OG	ECM	211	LHC CONR B	B	REVERSE OVERRIDE	26
E217	TXL	0.5	BN/WH	ECM	217	AWD	B	AWD CONTROL	27
E219	TXL	0.5	DG/YE	ECM	219	LOAD CENTER	22	FUEL PUMP, COIL -	28
E222	TFE	0.5	YE	TMAP	4	ECM	222	PRESSURE SENSOR	29
E223A	TXL	0.5	WH	ECM	223	TRANSMISSION SWITCH	B	TRANSMISSION SIGNAL OUTPUT	30
E224	TFE	0.5	BU	TMAP	2	ECM	224	AIR TEMP SENSOR	31
E225	TFE	0.5	RD	ECM	225	IAC	3	IAC DRIVE B	32
E226	TFE	0.5	BK	ECM	226	IAC	4	IAC DRIVE A	33
E228	TXL	0.5	GY	RIGHT HAND CONTROL	4	ECM	228	AWD REQUEST	34
E230A	TXL	0.5	VT	ECM	230	SPLICE, ECM SIGNAL GROUND	I	ECM SIGNAL GROUND	35
E230B	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	I	COOLANT TEMP SENSOR	I	ECM SIGNAL GROUND	36
E230C	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	I	RIGHT HAND CONTROL	2	ECM SIGNAL GROUND	37
E230D	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	2	TRANSMISSION SWITCH	A	ECM SIGNAL GROUND	38
E231	TFE	0.5	VT	ECM	231	TPS	I	TPS GROUND	39
E232	TXL	0.5	PK/WH	RIGHT HAND CONTROL	I	ECM	232	THROTTLE SAFETY SWITCH	40
E236A	TXL	0.5TP	YE	ECM	236	SPLICE, CAN HIGH	I	CAN HIGH	41
E236B	TXL	0.5TP	YE	SPLICE, CAN HIGH	I	DIAGNOSTIC	H	CAN HIGH	42
E236C	TXL	0.5TP	YE	SPLICE, CAN HIGH	I	SPEEDOMETER	I	CAN HIGH	43
E237	TFE	0.5	DG	ECM	237	IAC	I	IAC DRIVE C	44
E238	TFE	0.5	BU	ECM	238	IAC	6	IAC DRIVE D	45
E242	TFE	0.5	VT	ECM	242	TMAP	I	SENSOR RETURN, T-MAP	46
E244	TXL	0.5	YE	COOLANT TEMP SENSOR	2	ECM	244	COOLANT TEMP SIGNAL	47
E245	TXL	0.5	GN/RD	SPEED SENSOR	C	ECM	245	GROUND SPEED SIGNAL	48
E248A	TXL	0.5TP	DG	ECM	248	SPLICE, CAN LOW	2	CAN LOW	49
E248B	TXL	0.5TP	DG	SPLICE, CAN LOW	I	DIAGNOSTIC	G	CAN LOW	50
E248C	TXL	0.5TP	DG	SPLICE, CAN LOW	I	SPEEDOMETER	2	CAN LOW	51
FAA	TXL	1.0	OG/WH	LOAD CENTER	31	SPLICE, ACCESSORY	I	ACC FUSE POWER OUT	52
FAB	TXL	1.0	OG/WH	SPLICE, ACCESSORY	I	BULKHEAD ACCESSORY 1 B+	I	FUSE ACCESSORIES, B+	53
FAC	TXL	1.0	OG/WH	SPLICE, ACCESSORY	2	BULKHEAD ACCESSORY 2 B+	I	FUSE ACCESSORIES, B+	54
FAD	TXL	0.8	OG/WH	SPLICE, ACCESSORY	2	POD ACC B+	I	FUSE ACCESSORIES, B+	55
FDA	TXL	0.8	RD/GN	LOAD CENTER	23	SPLICE, DRIVE	I	DRIVE FUSE POWER OUT	56
FDC	TXL	0.8	RD/GN	SPLICE, DRIVE	2	WINCH SWITCH	I	WINCH SWITCH POWER	57
FDD	TXL	0.5	RD/GN	SPLICE, DRIVE	I	AWD	C	SWITCHED, B+	58
FJ	TXL	1.0	RD/GN	LOAD CENTER	24	LOAD CENTER	2	EFI FUSE,EFI RELAT, B+	59
FLA	TXL	2.0	RD/BN	LOAD CENTER	15	SPLICE, LIGHTS B+	2	LIGHTS FUSE POWER OUT	60
FLB	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	KEY SWITCH	A	LIGHTS B+	61
FLC	TXL	1.0	RD/BN	SPLICE, LIGHTS B+	2	LOAD CENTER	26	LIGHTS B+, LOW BEAM	62
FLD	TXL	0.5	RD/BN	SPLICE, LIGHTS B+	2	RH TAILLIGHT	I	LIGHTS B+, TAIL LIGHT	63
FLE	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	LH TAILLIGHT	I	LIGHTS B+, TAIL LIGHT	64
FLF	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	I	LHC CONR A	D	KEY SWITCH B+, LIGHTS/START B+	65
FPA	TXL	0.5	RD/GN	LOAD CENTER	16	SPLICE, FP	I	EFI RELAY, FUSED B+	66
FPB	TXL	0.5	RD/GN	SPLICE, FP	I	LOAD CENTER	17	EFI RELAY, FUSED B+	67
FPC	TXL	0.5	RD/GN	SPLICE, FP	I	LOAD CENTER	18	EFI RELAY, FUSED B+	68
FPD	TXL	0.5	RD/GN	SPLICE, FP	2	LOAD CENTER	I	KEY SWITCH B+,EFI COIL +	69
FUA	TXL	0.8	RD/BK	CHASSIS DIODE	P2	LOAD CENTER	32	REVERSE POLARITY DIODE ANODE	70
FUB	TXL	0.5	RD/BK	CHASSIS DIODE	P2	DIAGNOSTIC	A	UNSWITCHED FUSED, B+	71
FUD	TXL	0.5	RD/WH	CHASSIS DIODE	P1	SPLICE, UNSWITCHED FUSE B+	I	REVERSE POLARITY DIODE CATHODE	72
FUE	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	SPEEDOMETER	4	UNSWITCHED FUSED, B+	73
FUF	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	KEY SWITCH	C	UNSWITCHED FUSED, B+	74
FUG	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	LOAD CENTER	9	FAN RELAY COIL +	75
GAA	TXL	0.8	BN	GROUND A	I	FUEL PUMP/LEVEL	4	GROUND	76
GABA	TXL	3.0	BN	GROUND A	I	SPLICE, GROUND FRONT	2	GROUND	77
GABB	TXL	1.0	BN	SPLICE, GROUND FRONT	2	SPLICE, GROUND POD	2	GROUND	78
GABC	TXL	0.8	BN	SPLICE, GROUND FRONT	2	RIGHT HEADLIGHT	A	GROUND	79
GABD	TXL	0.5	BN	SPLICE, GROUND FRONT	2	FUEL PUMP/LEVEL	2	GROUND	80
GABE	TXL	0.5	BN	SPLICE, GROUND FRONT	2	LOAD CENTER	30	GROUND, LOW BEAM COIL -	81
GABG	TXL	0.5	BN	SPLICE, GROUND FRONT	I	DIAGNOSTIC	D	DIAGNOSTIC, GROUND	82
GABH	TXL	0.8	BN	SPLICE, GROUND FRONT	I	LEFT HEADLIGHT	A	GROUND	83
GABJ	TXL	0.5	BN	SPLICE, GROUND POD	I	LHC CONR B	C	GROUND	84
GABK	TXL	0.8	BN	SPLICE, GROUND POD	2	POD ACC GROUND	I	GROUND	85
GABL	TXL	0.8	BN	SPLICE, GROUND POD	2	POD LIGHT	A	GROUND,POD LIGHT (OPTIONAL)	86
GABM	TXL	0.5	BN	SPLICE, GROUND POD	2	SPEEDOMETER	5	GROUND	87
GABN	TXL	0.5	BN	SPLICE, GROUND POD	2	BRAKE SWITCH	P1	LIGHTS B+	88
GABP	TXL	0.5	BN	SPLICE, GROUND POD	2	RIGHT HAND CONTROL	3	GROUND	89
GAC	TXL	0.5	BN	GROUND A	I	LOAD CENTER	8	CHASSIS RELAY COIL GROUND	90
GAD	TXL	1.0	BN	GROUND A	I	FAN	A	GROUND	91
GBA	TXL	0.5	BN	GROUND B	I	ECM	250	GROUND	92
GBB	TXL	0.5	BN	GROUND B	I	ECM	251	GROUND	93
GBC	TXL	0.5	BN	GROUND B	I	ECM	252	GROUND	94
GBD	TXL	0.5	BN	GROUND B	I	SPEED SENSOR	B	GROUND	95
GBGA	TXL	0.5	BN	GROUND B	I	SPLICE, SHIELD	I	GROUND	96

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SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
GBGB	TXL	0.5	BN	SPLICE, CPS SHIELD	I	CRANK POSITION SENSOR	3	CRANK POSITION SENSOR SHIELD	97
GBHA	TXL	0.8	BN	GROUND B	I	SPLICE, GROUND REAR	I	GROUND	98
GBHB	TXL	0.8	BN	SPLICE, GROUND REAR	2	RH TAILLIGHT	2	GROUND	99
GBHC	TXL	0.8	BN	SPLICE, GROUND REAR	2	LH TAILLIGHT	2	GROUND	100
KB	TXL	0.5	BU/YE	KEY SWITCH	B	START SOLENOID	I	START SIGNAL	101
KDA	TXL	0.5	RD/BK	KEY SWITCH	D	LHC CONR B	F	KEY SWITCH B+, RUN/STOP SUPPLY	102
KDB	TXL	0.5	OG	LHC CONR A	C	SPLICE, R/S B+	I	RUN/STOP SIGNAL, R/S SPLICE B+	103
KDC	TXL	0.5	OG	SPLICE, R/S B+	I	DIAGNOSTIC	B	KEY SWITCH B+,DIAGNOSTIC	104
KDD	TXL	0.5	OG	SPLICE, R/S B+	I	SPEEDOMETER	3	KEY SWITCH B+,SPEEDOMETER	105
KDG	TXL	0.5	OG	SPLICE, R/S B+	2	LOAD CENTER	3	CHASSIS RELAY COIL POWER	106
KDH	TXL	0.5	OG	SPLICE, R/S B+	2	SPEED SENSOR	A	KEY SWITCH B+,SPEED SENSOR	107
KDJ	TXL	0.5	OG	SPLICE, R/S B+	2	ECM	209	KEY SWITCH B+,ECM B+	108
RCA	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	7	SWITCHED, B+	109
RCB	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	11	SWITCHED, B+	110
RCC	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	19	SWITCHED, B+	111
RCD	TXL	1.0	WH	SPLICE, B+ SWITCHED	I	LOAD CENTER	27	SWITCHED, B+	112
RF	TXL	1.0	OG/BK	LOAD CENTER	13	FAN	B	FAN RELAY POWER OUT	113
RJA	TXL	1.0	RD/BU	LOAD CENTER	5	SPLICE, EFI RELAY		EFI RELAY POWER OUT	114
RJB	TXL	1.0	RD/BU	SPLICE, EFI RELAY	I	ECM	253	EFI RELAY, B+	115
RJC	TFE	0.8	RD	INJECTOR DRIVER	2	SPLICE, EFI RELAY	2	EFI RELAY, B+	116
RLA	TXL	1.0	DG	LOAD CENTER	29	SPLICE, LOW BEAM	I	LOW BEAM B+	117
RLB	TXL	0.8	DG	SPLICE, LOW BEAM	I	LEFT HEADLIGHT	B	LOW BEAM B+	118
RLC	TXL	0.8	DG	SPLICE, LOW BEAM	2	RIGHT HEADLIGHT	B	LOW BEAM B+	119
RP	TXL	0.8	RD/BU	LOAD CENTER	21	FUEL PUMP/LEVEL	3	EFI RELAY, B+	120
SII	TXL	0.5	VT/WH	FUEL PUMP/LEVEL	I	SPEEDOMETER	11	FUEL SENSOR	121
XBA	TXL	0.5	BN/WH	BRAKE SWITCH	P2	BRAKE DIODE	2	BRAKE SIGNAL	122
XBB	TXL	0.5	BN/WH	BRAKE DIODE	2	START SOLENOID	2	START RELAY ENABLE	123
XBC	TXL	0.5	BN/WH	BRAKE DIODE	I	LH TAILLIGHT	3	BRAKE SIGNAL	124
XBD	TXL	0.5	BN/WH	BRAKE DIODE	I	RH TAILLIGHT	3	BRAKE SIGNAL	125
XHA	TXL	0.5	YE	LHC CONR A	E	SPLICE, HIGH BEAM	I	HIGH BEAM SIGNAL	126
XHB	TXL	0.5	YE	SPLICE, HIGH BEAM	2	POD LIGHT	B	HIGH BEAM B+, POD LIGHT (OPTIONAL)	127
XHC	TXL	0.5	YE	SPLICE, HIGH BEAM	2	SPEEDOMETER	8	HIGH BEAM SIGNAL	128
XL	TXL	0.5	DG	LHC CONR A	F	LOAD CENTER	25	LOW BEAM SIGNAL	129

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WIRE PREFIX LEGEND	
WIRE PREFIX	FUNCTION
B	BATTERY VOLTAGE WHEN BATTERY IS CONNECTED
K	BATTERY VOLTAGE WHEN KEY AND RUN/STOP SWITCHES ARE ON
G	GROUND
F	FUSE OUTPUT
FA	ACCESSORIES
FC	CHASSIS
FD	DRIVE
FE	ECM
FJ	FUEL INJECTION
FL	LIGHTS (LOW BEAM IF SEPARATE)
FM	LIGHTS, HIGH BEAM
FP	FUEL PUMP
FS	STARTER
FT	POWER STEERING
FU	UNSWITCHED
FZ	HAZARD
R	RELAY OUTPUT
RA	ACCESSORIES
RB	BATTERY
RC	CHASSIS
RE	ECM
RF	FAN
RJ	FUEL INJECTION
RL	LIGHTS, LOW BEAM
RM	LIGHTS, HIGH BEAM
RP	FUEL PUMP
RS	STARTER
RT	POWER STEERING
X	SWITCH OUTPUT
XB	BRAKE
XC	ADC or ADC/AWD 2
XD	AWD or ADC/AWD 1
XH	HIGH BEAM
XL	LOW BEAM
XT	TURF
XWH	HANDWARMER HIGH
XWL	HANDWARMER LOW
XWT	THUMBWARMER
XN	HORN
XS	START COMMAND
XTL	TURN SIGNAL LEFT
XTR	TURN SIGNAL RIGHT
XR	REVERSE COMMAND
XV	REVERSE OVERRIDE COMMAND
XZ	HAZARD
E	ECM PIN NUMBER
S	SPEEDOMETER PIN NUMBER
CB	CIRCUIT BREAKER OUTPUT
H	HAZARD/TURN FLASHER PIN NUMBER
A	ABS ECU
BUS	INTERNAL BUSS IN THE LOAD CENTER
NUMBER	MISCELLANEOUS

HARNESS-MAIN,SPMN 570 EPS

WIRE COLOR LEGEND	
BK	BLACK (TAN)
BL	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GN	GREEN
GR	LIGHT GREEN
DG	DARK GREEN
OR	ORANGE
PK	PINK
RD	RED
RS	VIOLET (ORCHID)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN STRACE COLORS. EXAMPLE GR/YE = RED WITH YELLOW TRACE.

▽ = ENGINE GROUND

▽ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

DIAGNOSTIC

WINCH SWITCH

LH HEADLIGHT (P/N 2410615) (HEADLIGHT BULB SERVICE P/N 4010553)

POD LIGHT P/N 2410614

SPEEDOMETER

RH HEADLIGHT (P/N 2410616) (HEADLIGHT BULB SERVICE P/N 4010253)

EPS POWER (A)	
PIN	FUNCTION
A	BATTERY (+)
B	BATTERY (-)

EPS SENSOR (B)	
PIN	FUNCTION
1	ENGINE RPM (REC. REF)
2	ENGINE RPM
3	IGNITION SIGNAL
4	CAN BUS LOW
5	VEHICLE SPEED
6	VEHICLE SPEED (REC. REF)
7	EPAS SYSTEM FAULT SIGNAL
8	CAN BUS HIGH

POWER STEERING ASSEMBLY (P/N 2411530)

RIGHT HANDLEBAR SWITCH ASSEMBLY

KEY SWITCH (P/N 4012183)

LEFT HANDLEBAR SWITCH ASSEMBLY (P/N 4011835)

LHC CONN A

LHC CONN B

SPLICE, GROUND POD

SPLICE, GROUND FRONT

SPLICE, HIGH BEAM

SPLICE, CAN LOW

SPLICE, CAN HIGH

SPLICE, LOW BEAM

SPLICE, ACCESSORY

SPLICE, B+ UNSWITCHED

SPLICE, B+ SWITCHED

SPLICE, LIGHTS B+

SPLICE, UNSWITCHED FUSE B+

CHASSIS DIODE (P/N 2410000)

SPLICE, R/S B+

SPLICE, DRIVE

POD ACC B+

POD ACC GROUND

12V RECEPTACLE (P/N 4010630)

FUEL PUMP

TANK LEVEL	RESISTANCE (Ω)
FULL	6.0±1.5Ω
EMPTY	90.0±4.5Ω

PIN	FUNCTION
1	FUEL LEVEL SENSOR "+"
2	FUEL LEVEL SENSOR "-"
3	FUEL PUMP "+"
4	FUEL PUMP "-"

FUEL PUMP/LEVEL

FAN MOTOR

AWD HUB COIL

AWD COIL 24Ω

IGNITION COIL (P/N 4011834)

PRIMARY R:42Ω±15% SECONDARY R:14kΩ±15%

TRIM FLUSH

INJECTOR DRIVER

RESISTANCE: 12Ω±5% FUEL INJECTOR

SPLICE, SHIELD

SPLICE, EFI RELAY

SPEED SENSOR

HALL SENSOR

POWER IN PIN "A"

V.OUT PIN "C"

COMMON PIN "B"

(LOCATED ON TRANSMISSION)

TRANSMISSION SWITCH P/N 766199

HIGH	82Ω±3
LOW	390Ω ±3
NEU	160Ω ±3
REV	730Ω ±3
PARK	240Ω ±3

SPLICE, ECM SIGNAL GROUND

SPLICE, GROUND REAR

BRAKE DIODE (P/N 2411051) 6A DIODE

THERMISTOR (P/N 4010644)

NOMINAL RESISTANCE: AT 20 °C±2.5 kΩ±0.5% AT 100 °C±0.184 kΩ±0.2%

T-MAP (P/N 2411528)

PRESSURE SENSOR	1 GROUND 2 NTC 3 +5V 4 OUTPUT SIGNAL

TPS (P/N 4010645)

IDLE AIR CONTROL

RESISTANCE BETWEEN PINS	
PINS	RESISTANCE
1-2	35Ω±0.2Ω
2-3	35Ω±0.2Ω
1-3	65Ω±2.4Ω
4-5	35Ω±0.2Ω
5-6	35Ω±0.2Ω
4-6	65Ω±2.4Ω
ALL OTHER COMBINATIONS: OPEN	

TEMP	RESISTANCE
68.72 °F	10kΩ±5%

CRANK POSITION SENSOR

SPLICE, CPS SHIELD

CIRCUIT BREAKER P/N 2410692 10 AMP

SPLICE, FUSIBLE #1

SPLICE, FUSIBLE #2

TRANSMISSION SWITCH

BRAKE SWITCH (P/N 4011823)

LH TAILLIGHT (P/N 2411153) (TAILLIGHT SOCKET SERVICE P/N 4011101) (TAILLIGHT BULB SERVICE P/N 4010764)

RH TAILLIGHT (P/N 2411541) (TAILLIGHT SOCKET SERVICE P/N 4011101) (TAILLIGHT BULB SERVICE P/N 4010764)

STATOR (P/N 4013970) (FLYWHEEL P/N 4013969)

REGULATOR (4014543)

START SOLENOID

STARTER MOTOR

BATTERY VOLTAGE: 12V

B+ TERMINAL BLOCK (P/N 4010823)

GROUND TERMINAL BLOCK

GROUND JUNCTION BLOCK

BRAKE SWITCH

HARNESS-MAIN,SPMN 570 EPS

WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.

E = ENGINE GROUND

C = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
4014424-680	SGT	13.0	RD	SOLENOID B+	I	SOLENOID B+	I	TBD	1
4014535-SOL	SGT	13.0	RD	B+	I	B+	I	TBD	2
4014535-TB	SGT	13.0	RD	B+	I	B+	I	TBD	3
4014546-START	SGT	13.0	BK	GND	I	GND	I	TBD	4
4014546-TB	SGT	13.0	BK	GND	I	GND	I	TBD	5
BAA	FUSIBLE LINK	1.0	BK	BATTERY PLUS #1	I	SPLICE, FUSIBLE #1	I	UNSWITCHED, B+	6
BAB	TXL	3.0	RD	SPLICE, FUSIBLE #1	2	LOAD CENTER	35	UNSWITCHED, B+	7
BBA	FUSIBLE LINK	0.8	BU	BATTERY PLUS #1	I	SPLICE, FUSIBLE #2	2	UNSWITCHED,B+	8
BBB	TXL	2.0	RD	SPLICE, FUSIBLE #2	I	SPLICE, B+ UNSWITCHED	I	UNSWITCHED, B+	9
BBD	TXL	2.0	RD	LOAD CENTER	28	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	10
BBE	TXL	0.5	RD	LOAD CENTER	20	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	11
BBF	TXL	2.0	RD	LOAD CENTER	4	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	12
BBG	TXL	0.5	RD	LOAD CENTER	12	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	13
BCA	TXL	1.0	RD	BATTERY PLUS #1	I	FAN CKT BKR	I	UNSWITCHED, B+	14
CBA	TXL	1.0	RD/WH	LOAD CENTER	10	FAN CKT BKR	2	UNSWITCHED FUSED, B+	15
C_A227	TXL	0.5	BK	CRANK POSITION SENSOR	2	ECM	227	CRANK -	16
C_A239	TXL	0.5	WH	CRANK POSITION SENSOR	I	ECM	239	CRANK +	17
C_AC	SHLD	0.5	SHLD	SPLICE, SHIELD	I	SPLICE, CPS SHIELD	2	CRANK POSITION SENSOR SHIELD	18
C_B255	TXL	0.5	BK	IGNITION COIL	P1	ECM	255	MAG IGNITION CONTROL	19
C_BB	TXL	0.5	WH	IGNITION COIL	P2	SPLICE, EFI RELAY	2	PTO IGNITION CONTROL	20
C_BC	SHLD	0.35	SHLD	TRIM FLUSH	-	SPLICE, SHIELD	2	PRIMARY CABLE SHIELD	21
E202	TXL	0.5	DG/YE	ECM	202	LOAD CENTER	6	EFI RELAY COIL GROUND	22
E204	TXL	0.5	DG/YE	ECM	204	LOAD CENTER	14	FAN RELAY COIL GROUND	23
E205	TFE	0.5	BU	ECM	205	INJECTOR DRIVER	I	MAG INJECTOR CONTROL	24
E206	TFE	0.5	OG	TPS	3	ECM	206	5V TO TPS	25
E207	TFE	0.5	OG	ECM	207	TMAP	3	5V B+ MAP	26
E210	TFE	0.5	DG	TPS	2	ECM	210	TPS SIGNAL	27
E211	TXL	0.5	GY/OG	ECM	211	LHC CONR B	B	REVERSE OVERRIDE	28
E217	TXL	0.5	BN/WH	AWD	B	ECM	217	AWD CONTROL	29
E219	TXL	0.5	DG/YE	ECM	219	LOAD CENTER	22	FUEL PUMP, COIL -	30
E222	TFE	0.5	YE	TMAP	4	ECM	222	PRESSURE SENSOR	31
E223A	TXL	0.5	WH	ECM	223	TBD	B	TRANSMISSION SIGNAL OUTPUT	32
E224	TFE	0.5	BU	TMAP	2	ECM	224	AIR TEMP SENSOR	33
E225	TFE	0.5	RD	IAC	3	ECM	225	IAC DRIVE B	34
E226	TFE	0.5	BK	IAC	4	ECM	226	IAC DRIVE A	35
E228	TXL	0.5	GY	RIGHT HAND CONTROL	4	ECM	228	AWD REQUEST	36
E230A	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	I	ECM	230	ECM SIGNAL GROUND	37
E230B	TXL	0.5	VT	COOLANT TEMP SENSOR	I	SPLICE, ECM SIGNAL GROUND	I	ECM SIGNAL GROUND	38
E230C	TXL	0.5	VT	RIGHT HAND CONTROL	2	SPLICE, ECM SIGNAL GROUND	I	ECM SIGNAL GROUND	39
E230D	TXL	0.5	VT	TBD	A	SPLICE, ECM SIGNAL GROUND	2	ECM SIGNAL GROUND	40
E231	TFE	0.5	VT	TPS	I	ECM	231	TPS GROUND	41
E232	TXL	0.5	PK/WH	RIGHT HAND CONTROL	I	ECM	232	THROTTLE SAFETY SWITCH	42
E236A	TXL	0.5TP	YE	SPLICE, CAN HIGH	I	ECM	236	CAN HIGH	43
E236B	TXL	0.5TP	YE	SPLICE, CAN HIGH	I	DIAGNOSTIC	H	CAN HIGH	44
E236C	TXL	0.5TP	YE	SPEEDOMETER	I	SPLICE, CAN HIGH	I	CAN HIGH	45
E236D	TXL	0.5TP	YE	SPLICE, CAN HIGH	2	EPS SIGNAL	8	CAN HIGH, EPS	46
E237	TFE	0.5	DG	IAC	I	ECM	237	IAC DRIVE C	47
E238	TFE	0.5	BU	IAC	6	ECM	238	IAC DRIVE D	48
E242	TFE	0.5	VT	TMAP	I	ECM	242	SENSOR RETURN, T-MAP	49
E244	TXL	0.5	YE	ECM	244	COOLANT TEMP SENSOR	2	COOLANT TEMP SIGNAL	50
E245	TXL	0.5	GN/RD	SPEED SENSOR	C	ECM	245	GROUND SPEED SIGNAL	51
E248A	TXL	0.5TP	DG	SPLICE, CAN LOW	2	ECM	248	CAN LOW	52
E248B	TXL	0.5TP	DG	SPLICE, CAN LOW	I	DIAGNOSTIC	G	CAN LOW	53
E248C	TXL	0.5TP	DG	SPLICE, CAN LOW	I	SPEEDOMETER	2	CAN LOW	54
E248D	TXL	0.5TP	DG	SPLICE, CAN LOW	2	EPS SIGNAL	4	CAN LOW, EPS	55
FAA	TXL	1.0	OG/WH	SPLICE, ACCESSORY	I	LOAD CENTER	31	ACC FUSE POWER OUT	56
FAB	TXL	1.0	OG/WH	SPLICE, ACCESSORY	I	BULKHEAD ACCESSORY 1 B+	I	FUSE ACCESSORIES, B+	57
FAC	TXL	1.0	OG/WH	SPLICE, ACCESSORY	2	BULKHEAD ACCESSORY 2 B+	I	FUSE ACCESSORIES, B+	58
FAD	TXL	0.8	OG/WH	SPLICE, ACCESSORY	2	POD ACC B+	I	FUSE ACCESSORIES, B+	59
FDA	TXL	0.8	RD/GN	SPLICE, DRIVE	I	LOAD CENTER	23	DRIVE FUSE POWER OUT	60
FDC	TXL	0.8	RD/GN	WINCH SWITCH	I	SPLICE, DRIVE	2	WINCH SWITCH POWER	61
FDD	TXL	0.5	RD/GN	AWD	C	SPLICE, DRIVE	I	SWITCHED, B+	62
FJ	TXL	1.0	RD/GN	LOAD CENTER	24	LOAD CENTER	2	EFI FUSE,EFI RELAY, B+	63
FLA	TXL	2.0	RD/BN	SPLICE, LIGHTS B+	2	LOAD CENTER	15	LIGHTS FUSE POWER OUT	64
FLB	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	KEY SWITCH	A	LIGHTS B+	65
FLC	TXL	1.0	RD/BN	LOAD CENTER	26	SPLICE, LIGHTS B+	2	LIGHTS B+, LOW BEAM	66
FLD	TXL	0.5	RD/BN	SPLICE, LIGHTS B+	2	RH TAILLIGHT	3	LIGHTS B+, TAIL LIGHT	67
FLE	TXL	0.5	RD/BN	SPLICE, LIGHTS B+	2	LH TAILLIGHT	3	LIGHTS B+, TAIL LIGHT	68
FLF	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	I	LHC CONR A	D	KEY SWITCH B+, LIGHTS/START B+	69
FPA	TXL	0.5	RD/GN	LOAD CENTER	16	SPLICE, FP	I	EFI RELAY, FUSED B+	70
FPB	TXL	0.5	RD/GN	LOAD CENTER	17	SPLICE, FP	I	EFI RELAY, FUSED B+	71
FPC	TXL	0.5	RD/GN	LOAD CENTER	18	SPLICE, FP	I	EFI RELAY, FUSED B+	72
FPD	TXL	0.5	RD/GN	SPLICE, FP	2	LOAD CENTER	I	KEY SWITCH B+,EFI COIL +	73
FT	TXL	3.0	RD	LOAD CENTER	34	LOAD CENTER	39	UNSWITCHED, B+	74
FUA	TXL	0.8	RD/BK	CHASSIS DIODE	P2	LOAD CENTER	32	REVERSE POLARITY DIODE ANODE	75
FUB	TXL	0.5	RD/BK	DIAGNOSTIC	A	CHASSIS DIODE	P2	UNSWITCHED FUSED, B+	76
FUD	TXL	0.5	RD/WH	CHASSIS DIODE	P1	SPLICE, UNSWITCHED FUSE B+	I	REVERSE POLARITY DIODE CATHODE	77
FUE	TXL	0.5	RD/WH	SPEEDOMETER	4	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	78
FUF	TXL	0.5	RD/WH	KEY SWITCH	C	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	79
FUG	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	LOAD CENTER	9	FAN RELAY COIL +	80
GAA	TXL	0.8	BN	FUEL PUMP/LEVEL	4	GROUND A	I	GROUND	81
GABA	TXL	3.0	BN	SPLICE, GROUND FRONT	2	GROUND A	I	GROUND	82
GABB	TXL	1.0	BN	SPLICE, GROUND POD	2	SPLICE, GROUND FRONT	2	GROUND	83
GABC	TXL	0.8	BN	RIGHT HEADLIGHT	A	SPLICE, GROUND FRONT	2	GROUND	84
GABD	TXL	0.5	BN	SPLICE, GROUND FRONT	2	FUEL PUMP/LEVEL	2	GROUND	85
GABE	TXL	0.5	BN	LOAD CENTER	30	SPLICE, GROUND FRONT	2	GROUND, LOW BEAM COIL -	86
GABF	TXL	0.5	BN	LOAD CENTER	38	SPLICE, GROUND FRONT	2	GROUND	87
GABG	TXL	0.5	BN	DIAGNOSTIC	D	SPLICE, GROUND FRONT	I	DIAGNOSTIC, GROUND	88
GABH	TXL	0.8	BN	LEFT HEADLIGHT	A	SPLICE, GROUND FRONT	I	GROUND	89
GABJ	TXL	0.5	BN	LHC CONR B	C	SPLICE, GROUND POD	I	GROUND	90
GABK	TXL	0.8	BN	POD ACC GROUND	I	SPLICE, GROUND POD	2	GROUND	91
GABL	TXL	0.8	BN	POD LIGHT	A	SPLICE, GROUND POD	2	GROUND,POD LIGHT (OPTIONAL)	92
GABM	TXL	0.5	BN	SPLICE, GROUND POD	2	SPEEDOMETER	5	GROUND	93
GABN	TXL	0.5	BN	BRAKE SWITCH	P1	SPLICE, GROUND POD	2	LIGHTS B+	94
GABP	TXL	0.5	BN	SPLICE, GROUND POD	2	RIGHT HAND CONTROL	3	GROUND	95
GAC	TXL	0.5	BN	GROUND A	I	LOAD CENTER	8	CHASSIS RELAY COIL GROUND	96

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SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
GAD	TXL	1.0	BN	FAN	A	GROUND A	I	GROUND	97
GBA	TXL	0.5	BN	ECM	250	GROUND B	I	GROUND	98
GBB	TXL	0.5	BN	GROUND B	I	ECM	251	GROUND	99
GBC	TXL	0.5	BN	GROUND B	I	ECM	252	GROUND	100
GBD	TXL	0.5	BN	SPEED SENSOR	B	GROUND B	I	GROUND	101
GBF	TXL	3.0	BN	EPS POWER	B	GROUND B	I	GROUND	102
GBGA	TXL	0.5	BN	SPLICE, SHIELD	I	GROUND B	I	GROUND	103
GBGB	TXL	0.5	BN	CRANK POSITION SENSOR	3	SPLICE, CPS SHIELD	I	CRANK POSITION SENSOR SHIELD	104
GBHA	TXL	0.8	BN	GROUND B	I	SPLICE, GROUND REAR	I	GROUND	105
GBHB	TXL	0.8	BN	RH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	106
GBHC	TXL	0.8	BN	LH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	107
KB	TXL	0.5	BU/YE	KEY SWITCH	B	START SOLENOID	I	START SIGNAL	108
KDA	TXL	0.5	RD/BK	KEY SWITCH	D	LHC CONR B	F	KEY SWITCH B+, RUN/STOP SUPPLY	109
KDB	TXL	0.5	OG	LHC CONR A	C	SPLICE, R/S B+	I	RUN/STOP SIGNAL, R/S SPLICE B+	110
KDC	TXL	0.5	OG	SPLICE, R/S B+	I	DIAGNOSTIC	B	KEY SWITCH B+,DIAGNOSTIC	111
KDD	TXL	0.5	OG	SPEEDOMETER	3	SPLICE, R/S B+	I	KEY SWITCH B+,SPEEDOMETER	112
KDE	TXL	0.5	OG	SPLICE, R/S B+	2	EPS SIGNAL	3	KEY SWITCH B+	113
KDF	TXL	0.5	OG	SPLICE, R/S B+	2	LOAD CENTER	33	KEY SWITCH B+,EPS COIL +	114
KDG	TXL	0.5	OG	LOAD CENTER	3	SPLICE, R/S B+	2	CHASSIS RELAY COIL POWER	115
KDH	TXL	0.5	OG	SPEED SENSOR	A	SPLICE, R/S B+	2	KEY SWITCH B+,SPEED SENSOR	116
KDJ	TXL	0.5	OG	SPLICE, R/S B+	2	ECM	209	KEY SWITCH B+,ECM B+	117
RCA	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	7	SWITCHED, B+	118
RCB	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	11	SWITCHED, B+	119
RCC	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	19	SWITCHED, B+	120
RCD	TXL	1.0	WH	SPLICE, B+ SWITCHED	I	LOAD CENTER	27	SWITCHED, B+	121
RF	TXL	1.0	OG/BK	FAN	B	LOAD CENTER	13	FAN RELAY POWER OUT	122
RJA	TXL	1.0	RD/BU	SPLICE, EFI RELAY	I	LOAD CENTER	5	EFI RELAY POWER OUT	123
RJB	TXL	1.0	RD/BU	ECM	253	SPLICE, EFI RELAY	I	EFI RELAY, B+	124
RJC	TFE	0.8	RD	SPLICE, EFI RELAY	2	INJECTOR DRIVER	2	TBD	125
RLA	TXL	1.0	DG	LOAD CENTER	29	SPLICE, LOW BEAM	I	LOW BEAM B+	126
RLB	TXL	0.8	DG	LEFT HEADLIGHT	B	SPLICE, LOW BEAM	I	LOW BEAM B+	127
RLC	TXL	0.8	DG	SPLICE, LOW BEAM	2	RIGHT HEADLIGHT	B	LOW BEAM B+	128
RP	TXL	0.8	RD/BU	FUEL PUMP/LEVEL	3	LOAD CENTER	21	EFI RELAY, B+	129
RT	TXL	3.0	OG	EPS POWER	A	LOAD CENTER	37	EPS RELAY SWITCHED POWER	130
SII	TXL	0.5	VT/WH	FUEL PUMP/LEVEL	I	SPEEDOMETER	11	FUEL SENSOR	131
XBA	TXL	0.5	BN/WH	BRAKE SWITCH	P2	BRAKE DIODE	2	BRAKE SIGNAL	132
XBB	TXL	0.5	BN/WH	BRAKE DIODE	2	START SOLENOID	2	START RELAY ENABLE	133
XBC	TXL	0.5	BN/WH	BRAKE DIODE	I	LH TAILLIGHT	I	BRAKE SIGNAL	134
XBD	TXL	0.5	BN/WH	BRAKE DIODE	I	RH TAILLIGHT	I	BRAKE SIGNAL	135
XHA	TXL	0.5	YE	LHC CONR A	E	SPLICE, HIGH BEAM	I	HIGH BEAM SIGNAL	136
XHB	TXL	0.5	YE	SPLICE, HIGH BEAM	2	POD LIGHT	B	HIGH BEAM B+, POD LIGHT (OPTIONAL)	137
XHC	TXL	0.5	YE	SPLICE, HIGH BEAM	2	SPEEDOMETER	8	HIGH BEAM SIGNAL	138
XL	TXL	0.5	DG	LHC CONR A	F	LOAD CENTER	25	LOW BEAM SIGNAL	139

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WIRE PREFIX LEGEND	
WIRE PREFIX	FUNCTION
B	BATTERY VOLTAGE WHEN BATTERY IS CONNECTED
K	BATTERY VOLTAGE WHEN KEY AND RUN/STOP SWITCHES ARE ON
G	GROUND
F	FUSE OUTPUT
FA	ACCESSORIES
FC	CHASSIS
FD	DRIVE
FE	ECM
FJ	FUEL INJECTION
FL	LIGHTS (LOW BEAM IF SEPARATE)
FM	LIGHTS, HIGH BEAM
FP	FUEL PUMP
FS	STARTER
FT	POWER STEERING
FU	UNSWITCHED
FZ	HAZARD
R	RELAY OUTPUT
RA	ACCESSORIES
RB	BATTERY
RC	CHASSIS
RE	ECM
RF	FAN
RJ	FUEL INJECTION
RL	LIGHTS, LOW BEAM
RM	LIGHTS, HIGH BEAM
RP	FUEL PUMP
RS	STARTER
RT	POWER STEERING
X	SWITCH OUTPUT
XB	BRAKE
XC	ADC or ADC/AWD 2
XD	AWD or ADC/AWD 1
XH	HIGH BEAM
XL	LOW BEAM
XT	TURF
XWH	HANDWARMER HIGH
XWL	HANDWARMER LOW
XWT	THUMBWARMER
XN	HORN
XS	START COMMAND
XTL	TURN SIGNAL LEFT
XTR	TURN SIGNAL RIGHT
XR	REVERSE COMMAND
XV	REVERSE OVERRIDE COMMAND
XZ	HAZARD
E	ECM PIN NUMBER
S	SPEEDOMETER PIN NUMBER
CB	CIRCUIT BREAKER OUTPUT
H	HAZARD/TURN FLASHER PIN NUMBER
A	ABS ECU
BUS	INTERNAL BUSS IN THE LOAD CENTER
NUMBER	MISCELLANEOUS

HARNESS-MAIN,SPMN 570 INTL

WIRE COLOR LEGEND	
BK	BLACK (DARK)
BN	BROWN
BU	LIGHT BLUE
DB	DARK BLUE
GN	GREEN
GY	GRAY
LG	LIGHT GREEN
OG	DARK ORANGE
OR	ORANGE
PK	PINK
PU	PURPLE
RD	VIOLA (RED-BLUE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN TRACE COLOR1, EXAMPLE ORD/YE = RED WITH YELLOW TRACE.

▽ = ENGINE GROUND

▽ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

DIAGNOSTIC

WINCH SWITCH

LH TURN SIGNAL (P/N 2411114)

(LH HEADLIGHT/RUNNING LIGHT /P/N 2411142) (HEADLIGHT BULB SERVICE P/N 4011324) (RUNNING LIGHT BULB SERVICE P/N 4010340)

POD LIGHT P/N 2410614

SPEEDOMETER

(RH HEADLIGHT/RUNNING LIGHT P/N 2411143) (HEADLIGHT BULB SERVICE P/N 4011324) (RUNNING LIGHT BULB SERVICE P/N 4010340)

RH TURN SIGNAL (P/N 2411114)

HORN (P/N 4011578)

RIGHT HANDLEBAR SWITCH ASSEMBLY

KEY SWITCH (P/N 4012146)

LEFT HANDLEBAR SWITCH ASSY (P/N 4013433)

	A	B	C	D	E	F	G	H	J	K	L	M	N	P
LOW BEAM														
HI BEAM														
FLASH PASS														
L TURN														
R TURN														
HEV OVERRIDE														
HAZARD														
HORN														
RUN														

A=YE/DG H=BN
B=BG/RD J=DB/RD
C=RD/GN K=GY/RD
D=BO/BK L=OG
E=GY/OG M=BK
F=RD N=BU
G=DG P=YE

POD ACC GROUND

12V RECEPTACLE (P/N 4010438)

FUEL PUMP

TANK LEVEL	RESISTANCE (Ω)
FULL	6.0±1.5Ω
EMPTY	90.0±4.5Ω

PIN	FUNCTION
1	FUEL LEVEL SENSOR "+"
2	FUEL LEVEL SENSOR "-"
3	FUEL PUMP "+"
4	FUEL PUMP "-"

FUEL PUMP/LEVEL

FAN MOTOR

AWD HUB COIL

AWD COIL 24Ω

IGNITION COIL (P/N 4013834)

PRIMARY 0.6Ω±18% SECONDARY 1.6kΩ±15%

TRIM FLUSH

INJECTOR DRIVER

RESISTANCE: 12Ω±5% FUEL INJECTOR

SPEED SENSOR

HALL SENSOR

TRANSMISSION SWITCH P/N 7041999

HIGH	420Ω
LOW	302Ω
NEU	180Ω
REV	102Ω
PARK	54Ω

LICENSE PLATE

THERMISTOR (P/N 4010644)

NOMINAL RESISTANCE: 1 AT 20 °C±2.5 KΩ±5% AT 100 °C±0.184 KΩ±0.2Ω

T-MAP (P/N 2411528)

PRESSURE SENSOR	1 GROUND
	2 NTC
	3 +5V
	4 OUTPUT SIGNAL

TPS 4-6 Ω±5%

IDLE AIR CONTROL

RESISTANCE BETWEEN PINS	
PINS	RESISTANCE
1-2	35Ω±8.2Ω
2-3	35Ω±8.2Ω
1-3	65Ω±8.4Ω
4-5	35Ω±8.2Ω
5-6	35Ω±8.2Ω
4-6	65Ω±8.4Ω
ALL OTHER COMBINATIONS:OPEN	

TEMP RESISTANCE 60 °F 2k Ω 16 °C

CRANK POSITION SENSOR

LED FLASHER MODULE (P/N 4013043)

1. HAZARD
2. IGNITION SWITCH
3. DIL-RIGHT
4. DIL-LEFT
5. GROUND
6. LOAD TYPE
7. REAR RIGHT
8. FRONT RIGHT
9. RIGHT TURN
10. LEFT TURN
11. FRONT LEFT
12. REAR LEFT

STATOR (P/N 4013970) (P/N 4013969)

REGULATOR (4014543)

START SOLENOID

STARTER MOTOR

BATTERY VOLTAGE: 12V

B+ TERMINAL BLOCK (P/N 4013982)

BRAKE SWITCH (P/N 4010723)

LH STOP/TAIL/TURN LIGHT (P/N 2410528) (STOP/TAIL LIGHT SOCKET SERVICE P/N 4011132) (TURN LIGHT SOCKET SERVICE P/N 4011133) (TAIL/STOP LIGHT BULB SERVICE P/N 4011344) (TURN LIGHT BULB SERVICE P/N 4011173)

RH STOP/TAIL/TURN LIGHT (P/N 2410529) (STOP/TAIL LIGHT SOCKET SERVICE P/N 4011132) (TURN LIGHT SOCKET SERVICE P/N 4011133) (TAIL/STOP LIGHT BULB SERVICE P/N 4011344) (TURN LIGHT BULB SERVICE P/N 4011173)

SPLICE, GROUND POD

SPLICE, GROUND FRONT

SPLICE, LOW BEAM

SPLICE, HIGH BEAM

SPLICE, GROUND HEADLIGHT

SPLICE, CAN LOW

SPLICE, CAN HIGH

SPLICE, ACCESSORY

SPLICE, B+ UNSWITCHED

SPLICE, B+ SWITCHED

SPLICE, UNSWITCHED FUSE B+

SPLICE, LIGHTS B+

CHASSIS DIODE (P/N 2410000)

SPLICE, R/S B+

SPLICE, SHIELD

SPLICE, EFI RELAY

SPLICE, CPS SHIELD

CIRCUIT BREAKER 10 AMP P/N 2410692

SPLICE, FUSIBLE #2

BRAKE DIODE (P/N 2411035) 6A 0100E

SPLICE, ECM SIGNAL GROUND

SPLICE, GROUND REAR

HARNESS-MAIN,SPMN 570 INTL

WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.

(E) = ENGINE GROUND

(C) = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
4014424-680	SGT	13.0	RD	SOLENOID B+	1	SOLENOID B+	1	TBD	1
4014535-SOL	SGT	13.0	RD	B+	1	B+	1	TBD	2
4014535-TB	SGT	13.0	BK	B+	1	B+	1	TBD	3
4014546-START	SGT	13.0	BK	GND	1	GND	1	TBD	4
4014546-TB	SGT	13.0	BK	GND	1	GND	1	TBD	5
BBA	FUSIBLE LINK	0.8	BU	BATTERY PLUS #1	1	SPLICE, FUSIBLE #2	2	UNSWITCHED,B+	6
BBB	TXL	2.0	RD	SPLICE, FUSIBLE #2	1	SPLICE, B+ UNSWITCHED	1	UNSWITCHED, B+	7
BBC	TXL	0.8	RD	LOAD CENTER	36	SPLICE, B+ UNSWITCHED	1	UNSWITCHED B+, HAZARD FUSE	8
BBD	TXL	2.0	RD	LOAD CENTER	28	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	9
BBE	TXL	0.5	RD	LOAD CENTER	20	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	10
BBF	TXL	2.0	RD	LOAD CENTER	4	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	11
BBG	TXL	0.5	RD	LOAD CENTER	12	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	12
BCA	TXL	1.0	RD	BATTERY PLUS #1	1	FAN CKT BKR	1	UNSWITCHED, B+	13
CBA	TXL	1.0	RD/WH	LOAD CENTER	10	FAN CKT BKR	2	UNSWITCHED FUSED, B+	14
C_A227	TXL	0.5	BK	CRANK POSITION SENSOR	2	ECM	227	CRANK -	15
C_A239	TXL	0.5	WH	CRANK POSITION SENSOR	1	ECM	239	CRANK +	16
C_AC	SHLD	0.5	SHLD	SPLICE, SHIELD	1	SPLICE, CPS SHIELD	2	PRIMARY CABLE SHIELD	17
C_B255	TXL	0.5	BK	IGNITION COIL	P1	ECM	255	MAG IGNITION CONTROL	18
C_BB	TXL	0.5	WH	IGNITION COIL	P2	SPLICE, EFI RELAY	2	PTO IGNITION CONTROL	19
C_BC	SHLD	0.35	SHLD	TRIM FLUSH	-	SPLICE, SHIELD	2	PRIMARY CABLE SHIELD	20
E202	TXL	0.5	DG/YE	ECM	202	LOAD CENTER	6	EFI RELAY COIL GROUND	21
E204	TXL	0.5	OG/YE	ECM	204	LOAD CENTER	14	FAN RELAY COIL GROUND	22
E205	TFE	0.5	BU	ECM	205	INJECTOR DRIVER		MAG INJECTOR CONTROL	23
E206	TFE	0.5	OG	TPS	3	ECM	206	5V TO TPS	24
E207	TFE	0.5	OG	ECM	207	TMAP	3	5V B+ MAP	25
E210	TFE	0.5	DG	TPS	2	ECM	210	TPS SIGNAL	26
E211	TXL	0.5	GY/OG	ECM	211	LEFT HAND CONTROL	L	REVERSE OVERRIDE	27
E217	TXL	0.5	BN/WH	AWD	B	ECM	217	AWD CONTROL	28
E219	TXL	0.5	DG/YE	ECM	219	LOAD CENTER	22	FUEL PUMP, COIL -	29
E222	TFE	0.5	YE	TMAP	4	ECM	222	PRESSURE SENSOR	30
E223	TXL	0.5	WH	ECM	223	TRANSMISSION SWITCH	B	TRANSMISSION SIGNAL OUTPUT	31
E224	TFE	0.5	BU	TMAP	2	ECM	224	AIR TEMP SENSOR	32
E225	TFE	0.5	RD	IAC	3	ECM	225	IAC DRIVE B	33
E226	TFE	0.5	BK	IAC	4	ECM	226	IAC DRIVE A	34
E228	TXL	0.5	GY	RIGHT HAND CONTROL	4	ECM	228	AWD REQUEST	35
E230A	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	1	ECM	230	ECM SIGNAL GROUND	36
E230B	TXL	0.5	VT	COOLANT TEMP SENSOR	1	SPLICE, ECM SIGNAL GROUND	1	ECM SIGNAL GROUND	37
E230C	TXL	0.5	VT	RIGHT HAND CONTROL	2	SPLICE, ECM SIGNAL GROUND	1	ECM SIGNAL GROUND	38
E230D	TXL	0.5	VT	TRANSMISSION SWITCH	A	SPLICE, ECM SIGNAL GROUND	2	ECM SIGNAL GROUND	39
E231	TFE	0.5	VT	TPS	1	ECM	231	TPS GROUND	40
E232	TXL	0.5	PK/WH	RIGHT HAND CONTROL	1	ECM	232	THROTTLE SAFETY SWITCH	41
E236A	TXL	0.5TP	YE	SPLICE, CAN HIGH	1	ECM	236	CAN HIGH	42
E236B	TXL	0.5TP	YE	SPLICE, CAN HIGH	1	DIAGNOSTIC	H	CAN HIGH	43
E236C	TXL	0.5TP	YE	SPEEDOMETER	1	SPLICE, CAN HIGH		CAN HIGH	44
E237	TFE	0.5	DG	IAC	1	ECM	237	IAC DRIVE C	45
E238	TFE	0.5	BU	IAC	6	ECM	238	IAC DRIVE D	46
E242	TFE	0.5	VT	TMAP	1	ECM	242	SENSOR RETURN, T-MAP	47
E244	TXL	0.5	YE	ECM	244	COOLANT TEMP SENSOR	2	COOLANT TEMP SIGNAL	48
E245	TXL	0.5	GN/RD	SPEED SENSOR	C	ECM	245	GROUND SPEED SIGNAL	49
E248A	TXL	0.5TP	DG	SPLICE, CAN LOW	2	ECM	248	CAN LOW	50
E248B	TXL	0.5TP	DG	SPLICE, CAN LOW	1	DIAGNOSTIC	G	CAN LOW	51
E248C	TXL	0.5TP	DG	SPLICE, CAN LOW	1	SPEEDOMETER	2	CAN LOW	52
FAA	TXL	1.0	OG/WH	SPLICE, ACCESSORY	1	LOAD CENTER	31	ACC FUSE POWER OUT	53
FAB	TXL	1.0	OG/WH	SPLICE, ACCESSORY	1	BULKHEAD ACCESSORY 1 B+	1	FUSE ACCESSORIES, B+	54
FAC	TXL	1.0	OG/WH	SPLICE, ACCESSORY	2	BULKHEAD ACCESSORY 2 B+	1	FUSE ACCESSORIES, B+	55
FAD	TXL	0.8	OG/WH	SPLICE, ACCESSORY	2	POD ACC B+	1	FUSE ACCESSORIES, B+	56
FDA	TXL	0.8	RD/GN	SPLICE, DRIVE	1	LOAD CENTER	23	DRIVE FUSE POWER OUT	57
FDC	TXL	0.8	RD/GN	WINCH SWITCH	1	SPLICE, DRIVE	2	WINCH SWITCH POWER	58
FDD	TXL	0.5	RD/GN	AWD	C	SPLICE, DRIVE	1	SWITCHED, B+	59
FDE	TXL	0.5	RD/GN	SPLICE, DRIVE	2	LEFT HAND CONTROL	C	B+ SWITCHED, HORN SUPPLY	60
FJ	TXL	1.0	RD/GN	LOAD CENTER	24	LOAD CENTER	2	EFI FUSE EFI RELAY, B+	61
FLA	TXL	2.0	RD/BN	SPLICE, LIGHTS B+	2	LOAD CENTER	15	LIGHTS FUSE POWER OUT	62
FLB	TXL	0.5	RD/BN	RH FRONT RUNNING LIGHT	1	SPLICE, LIGHTS B+	2	LIGHTS B+, RH RUNNING LIGHT	63
FLC	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	KEY SWITCH	A	LIGHTS B+	64
FLD	TXL	0.5	RD/BN	LICENSE PLATE	1	SPLICE, LIGHTS B+	2	LIGHTS B+	65
FLE	TXL	1.0	RD/BN	LOAD CENTER	26	SPLICE, LIGHTS B+	2	LIGHTS B+, LOW BEAM	66
FLF	TXL	0.5	RD/BN	SPLICE, LIGHTS B+	2	RH TAILLIGHT	1	LIGHTS B+, TAIL LIGHT	67
FLG	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	LH TAILLIGHT	1	LIGHTS B+, TAIL LIGHT	68
FLH	TXL	1.0	RD/BN	LOAD CENTER	42	SPLICE, LIGHTS B+	1	LIGHTS B+, HIGH BEAM	69
FLJ	TXL	0.5	RD/BN	HAZARD FLASHER	2	SPLICE, LIGHTS B+	1	LIGHTS B+, HAZARD IGN. INPUT	70
FLK	TXL	0.5	RD/BN	LH FRONT RUNNING LIGHT	1	SPLICE, LIGHTS B+	1	LIGHTS B+, LH RUNNING LIGHT	71
FPA	TXL	0.5	RD/GN	LOAD CENTER	16	SPLICE, FP	1	EFI RELAY, FUSED B+	72
FPB	TXL	0.5	RD/GN	LOAD CENTER	17	SPLICE, FP	1	EFI RELAY, FUSED B+	73
FPC	TXL	0.5	RD/GN	LOAD CENTER	18	SPLICE, FP	1	EFI RELAY, FUSED B+	74
FPD	TXL	0.5	RD/GN	SPLICE, FP	2	LOAD CENTER		KEY SWITCH B+,EFI COIL +	75
FUA	TXL	0.8	RD/BK	CHASSIS DIODE	P2	LOAD CENTER	32	REVERSE POLARITY DIODE ANODE	76
FUB	TXL	0.5	RD/BK	DIAGNOSTIC	A	CHASSIS DIODE	P2	UNSWITCHED FUSED, B+	77
FUD	TXL	0.5	RD/WH	CHASSIS DIODE	P1	SPLICE, UNSWITCHED FUSE B+	1	REVERSE POLARITY DIODE CATHODE	78
FUE	TXL	0.5	RD/WH	SPEEDOMETER	4	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	79
FUF	TXL	0.5	RD/WH	KEY SWITCH	C	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	80
FUG	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	C	LOAD CENTER	9	FAN RELAY COIL +	81
FZ	TXL	0.8	RD	LOAD CENTER	40	LEFT HAND CONTROL	F	FUSED B+, HAZARD FUSE	82
GAAA	TXL	1.0	BN	SPLICE, GROUND HEADLIGHT	2	GROUND A	1	GROUND, LEFT HEADLIGHT SPLICE	83
GAAB	TXL	0.8	BN	LEFT HEADLIGHT	P2	SPLICE, GROUND HEADLIGHT	1	GROUND	84
GAAD	TXL	0.8	BN	RIGHT HEADLIGHT	P2	SPLICE, GROUND HEADLIGHT	2	GROUND	85
GAAE	TXL	0.35	BN	LEFT FRONT TURN LAMP	2	SPLICE, GROUND HEADLIGHT	1	GROUND, LEFT FRONT TURN LIGHT	86
GAAF	TXL	0.5	BN	LH FRONT RUNNING LIGHT	2	SPLICE, GROUND HEADLIGHT	1	GROUND	87
GAAG	TXL	0.5	BN	RH FRONT RUNNING LIGHT	2	SPLICE, GROUND HEADLIGHT	2	GROUND	88
GAAH	TXL	0.35	BN	RIGHT FRONT TURN LAMP	2	SPLICE, GROUND HEADLIGHT	2	GROUND, RIGHT FRONT TURN LIGHT	89
GABA	TXL	3.0	BN	SPLICE, GROUND FRONT	2	GROUND A	1	GROUND	90
GABB	TXL	1.0	BN	SPLICE, GROUND POD	2	SPLICE, GROUND FRONT	2	GROUND	91
GABC	TXL	0.5	BN	HORN, GROUND	1	SPLICE, GROUND FRONT	2	GROUND, HORN	92
GABD	TXL	0.5	BN	SPLICE, GROUND FRONT	2	FUEL PUMP/LEVEL	2	GROUND	93
GABE	TXL	0.5	BN	LOAD CENTER	30	SPLICE, GROUND FRONT	2	GROUND, LOW BEAM COIL -	94
GABF	TXL	0.5	BN	BRAKE SWITCH	1	SPLICE, GROUND FRONT	2	LIGHTS B+	95
GABH	TXL	0.5	BN	LOAD CENTER	46	SPLICE, GROUND FRONT	1	GROUND, HIGH BEAM COIL -	96

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SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
GABJ	TXL	0.5	BN	SPLICE, GROUND FRONT	1	HAZARD FLASHER	5	GROUND, HAZARD FLASHER	97
GABK	TXL	0.5	BN	SPLICE, GROUND FRONT	1	HAZARD FLASHER	6	GROUND, REAR TURN SIGNAL TYPE	98
GABL	TXL	0.5	BN	DIAGNOSTIC	D	SPLICE, GROUND FRONT	1	DIAGNOSTIC, GROUND	99
GABM	TXL	0.5	BN	LEFT HAND CONTROL	M	SPLICE, GROUND POD	1	GROUND	100
GABN	TXL	0.5	BN	SPLICE, GROUND POD	1	LEFT HAND CONTROL	H	GROUND, TURN SIGNAL SUPPLY	101
GABP	TXL	0.8	BN	POD LIGHT	A	SPLICE, GROUND POD	2	GROUND,POD LIGHT (OPTIONAL)	102
GABQ	TXL	0.5	BN	SPLICE, GROUND POD	2	SPEEDOMETER	5	GROUND	103
GABR	TXL	0.8	BN	POD ACC GROUND	1	SPLICE, GROUND POD	2	GROUND	104
GABS	TXL	0.5	BN	SPLICE, GROUND POD	2	RIGHT HAND CONTROL	3	GROUND	105
GAC	TXL	0.5	BN	GROUND A	1	LOAD CENTER	8	CHASSIS RELAY COIL GROUND	106
GAD	TXL	1.0	BN	FAN	A	GROUND A	1	GROUND	107
GBA	TXL	0.5	BN	ECM	250	GROUND B	1	GROUND	108
GBB	TXL	0.5	BN	GROUND B	1	ECM	251	GROUND	109
GBC	TXL	0.5	BN	GROUND B	1	ECM	252	GROUND	110
GBD	TXL	0.5	BN	SPEED SENSOR	B	GROUND B	1	GROUND	111
GBE	TXL	0.8	BN	FUEL PUMP/LEVEL	4	GROUND B	1	GROUND	112
GBGA	TXL	0.5	BN	SPLICE, SHIELD	1	GROUND B	1	GROUND	113
GBGB	TXL	0.5	BN	CRANK POSITION SENSOR	3	SPLICE, CPS SHIELD	1	CRANK POSITION SENSOR SHIELD	114
GBHA	TXL	1.0	BN	GROUND B	1	SPLICE, GROUND REAR	1	GROUND	115
GBHB	TXL	0.5	BN	LICENSE PLATE	2	SPLICE, GROUND REAR	2	GROUND, LICENSE PLATE	116
GBHC	TXL	0.35	BN	RIGHT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND, RIGHT REAR TURN LIGHT	117
GBHD	TXL	0.8	BN	RH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	118
GBHE	TXL	0.8	BN	LH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	119
GBHF	TXL	0.35	BN	LEFT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND, LEFT REAR TURN LAMP	120
H01	TXL	0.5	BU	LEFT HAND CONTROL	N	HAZARD FLASHER	1	HAZARD INPUT	121
H03	TXL	0.5	DB/WH	HAZARD FLASHER	3	SPEEDOMETER	6	RIGHT TURN INDICATOR	122
H04	TXL	0.5	BU/WH	HAZARD FLASHER	4	SPEEDOMETER	7	LEFT TURN INDICATOR	123
H07	TXL	0.35	DB/YE	HAZARD FLASHER	7	RIGHT REAR TURN LAMP	1	RIGHT REAR TURN SIGNAL	124
H08	TXL	0.35	DB/OG	HAZARD FLASHER	8	RIGHT FRONT TURN LAMP	1	RIGHT FRONT TURN SIGNAL	125
H09	TXL	0.5	DB/RD	LEFT HAND CONTROL	J	HAZARD FLASHER	9	LEFT TURN SIGNAL COMMAND	126
H10	TXL	0.5	BU/RD	LEFT HAND CONTROL	B	HAZARD FLASHER	10	LEFT TURN SIGNAL COMMAND	127
H11	TXL	0.35	BU/OG	HAZARD FLASHER	11	LEFT FRONT TURN LAMP	1	LEFT FRONT TURN SIGNAL	128
H12	TXL	0.35	BU/YE	HAZARD FLASHER	12	LEFT REAR TURN LAMP	1	LEFT REAR TURN SIGNAL	129
KB	TXL	0.5	BU/YE	KEY SWITCH	B	START SOLENOID	1	START SIGNAL	130
KDA	TXL	0.5	RD/BK	KEY SWITCH	D	LEFT HAND CONTROL	D	KEY SWITCH B+, RUN/STOP SUPPLY	131
KDB	TXL	0.5	OG	LEFT HAND CONTROL	L	SPLICE, R/S B+	1	RUN/STOP SIGNAL, R/S SPLICE B+	132
KDC	TXL	0.5	OG	SPLICE, R/S B+	1	DIAGNOSTIC	B	KEY SWITCH B+,DIAGNOSTIC	133
KDD	TXL	0.5	OG	SPEEDOMETER	3	SPLICE, R/S B+	1	KEY SWITCH B+,SPEEDOMETER	134
KDG	TXL	0.5	OG	LOAD CENTER	3	SPLICE, R/S B+	2	CHASSIS RELAY COIL POWER	135
KDH	TXL	0.5	OG	SPEED SENSOR	A	SPLICE, R/S B+	2	KEY SWITCH B+,SPEED SENSOR	136
KDJ	TXL	0.5	OG	SPLICE, R/S B+	2	ECM	209	KEY SWITCH B+,ECM B+	137
KE	TXL	0.5	YE/DG	KEY SWITCH	E	LEFT HAND CONTROL	A	KEY SWITCH B+, LIGHTS/START B+	138
RCA	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	7	SWITCHED, B+	139
RCB	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	11	SWITCHED, B+	140
RCC	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	19	SWITCHED, B+	141
RCD	TXL	1.0	WH	SPLICE, B+ SWITCHED	1	LOAD CENTER	27	SWITCHED, B+	142
RF	TXL	1.0	OG/BK	FAN	B	LOAD CENTER	13	FAN RELAY POWER OUT	143
RJA	TXL	1.0	RD/BU	SPLICE, EFI RELAY	1	LOAD CENTER	5	EFI RELAY POWER OUT	144
RJB	TXL	1.0	RD/BU	ECM	253	SPLICE, EFI RELAY	1	EFI RELAY, B+	145
RJC	TFE	0.8	RD	INJECTOR DRIVER	2	SPLICE, EFI RELAY	2	TBD	146
RLA	TXL	1.0	DG	LOAD CENTER	29	SPLICE, LOW BEAM	1	LOW BEAM B+	147
RLB	TXL	0.8	DG	LEFT HEADLIGHT	P3	SPLICE, LOW BEAM	1	LOW BEAM B+	148
RLC	TXL	0.8	DG	SPLICE, LOW BEAM	2	RIGHT HEADLIGHT	P3	LOW BEAM B+	149
RMA	TXL	1.0	RD	LOAD CENTER	45	SPLICE, HIGH BEAM	1	HIGH BEAM B+	150
RMB	TXL	0.8	YE	SPLICE, HIGH BEAM	2	POD LIGHT	B	HIGH BEAM B+, POD LIGHT (OPTIONAL)	151
RMC	TXL	0.8	YE	RIGHT HEADLIGHT	P1	SPLICE, HIGH BEAM	2	HIGH BEAM B+, RIGHT HEADLIGHT	152
RMD	TXL	0.5	YE	SPLICE, HIGH BEAM	2	SPEEDOMETER	8	HIGH BEAM SIGNAL	153
RME	TXL	0.8	YE	SPLICE, HIGH BEAM	1	LEFT HEADLIGHT	P1	HIGH BEAM B+, LEFT HEADLIGHT	154
RP	TXL	0.8	RD/BU	FUEL PUMP/LEVEL	3	LOAD CENTER	21	EFI RELAY, B+	155
S11	TXL	0.5	VT/WH	FUEL PUMP/LEVEL	1	SPEEDOMETER	11	FUEL SENSOR	156
XBA	TXL	0.5	BN/WH	BRAKE SWITCH	2	BRAKE DIODE	2	BRAKE SIGNAL	157
XBB	TXL	0.5	BN/WH	BRAKE DIODE	2	START SOLENOID	2	START RELAY ENABLE	158
XBC	TXL	0.5	BN/WH	BRAKE DIODE	1	LH TAILLIGHT	3	BRAKE SIGNAL	159
XBD	TXL	0.5	BN/WH	BRAKE DIODE	1	RH TAILLIGHT	3	BRAKE SIGNAL	160
XH	TXL	0.5	YE	LEFT HAND CONTROL	P	LOAD CENTER	41	HIGH BEAM SIGNAL	161
XL	TXL	0.5	DG	LEFT HAND CONTROL	G	LOAD CENTER	25	LOW BEAM SIGNAL	162
XN	TXL	0.8	GY/RD	LEFT HAND CONTROL	K	HORN SIGNAL	1	HORN SUPPLY	163

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WIRE PREFIX LEGEND	
WIRE PREFIX	FUNCTION
B	BATTERY VOLTAGE WHEN BATTERY IS CONNECTED
K	BATTERY VOLTAGE WHEN KEY AND RUN/STOP SWITCHES ARE ON
G	GROUND
F	FUSE OUTPUT
FA	ACCESSORIES
FC	CHASSIS
FD	DRIVE
FE	ECM
FJ	FUEL INJECTION
FL	LIGHTS (LOW BEAM IF SEPARATE)
FM	LIGHTS, HIGH BEAM
FP	FUEL PUMP
FS	STARTER
FT	POWER STEERING
FU	UNSWITCHED
FZ	HAZARD
R	RELAY OUTPUT
RA	ACCESSORIES
RB	BATTERY
RC	CHASSIS
RE	ECM
RF	FAN
RJ	FUEL INJECTION
RL	LIGHTS, LOW BEAM
RM	LIGHTS, HIGH BEAM
RP	FUEL PUMP
RS	STARTER
RT	POWER STEERING
X	SWITCH OUTPUT
XB	BRAKE
XC	ADC or ADC/AWD 2
XD	AWD or ADC/AWD 1
XH	HIGH BEAM
XL	LOW BEAM
XT	TURF
XWH	HANDWARMER HIGH
XWL	HANDWARMER LOW
XWT	THUMBWARMER
XN	HORN
XS	START COMMAND
XTL	TURN SIGNAL LEFT
XTR	TURN SIGNAL RIGHT
XR	REVERSE COMMAND
XV	REVERSE OVERRIDE COMMAND
XZ	HAZARD
E	ECM PIN NUMBER
S	SPEEDOMETER PIN NUMBER
CB	CIRCUIT BREAKER OUTPUT
H	HAZARD/TURN FLASHER PIN NUMBER
A	ABS ECU
BUS NUMBER	INTERNAL BUSS IN THE LOAD CENTER
	MISCELLANEOUS

HARNESS-MAIN,SPMN 570 EPS INTL

WIRE COLOR LEGEND	
BK	BLACK (TAN)
BN	BROWN
BU	LIGHT BLUE
DB	DARK BLUE
GN	GREEN
GY	GRAY
LG	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN STRACE COLORS. EXAMPLE ORD/YE = RED WITH YELLOW TRACE.

▽ = ENGINE GROUND

▽ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

DIAGNOSTIC

WINCH SWITCH

BULKHEAD ACCESSORY 1 A+

BULKHEAD ACCESSORY 2 A+

LH TURN SIGNAL (P/N 2411143)

LH HEADLIGHT/RUNNING LIGHT /(P/N 2411142) (HEADLIGHT BULB SERVICE P/N 4011324) (RUNNING LIGHT BULB SERVICE P/N 4010340)

POD LIGHT P/N 2410614

SPEEDOMETER (PT "MT")

RH HEADLIGHT/RUNNING LIGHT (P/N 2411143) (HEADLIGHT BULB SERVICE P/N 4011324) (RUNNING LIGHT BULB SERVICE P/N 4010340)

RH TURN SIGNAL (P/N 2411144)

HORN (P/N 4011578)

EPS POWER (A)	
PIN	FUNCTION
A	BATTERY (+)
B	BATTERY (-)

EPS SENSOR (B)	
PIN	FUNCTION
1	ENGINE RPM (NEG. REF.)
2	ENGINE RPM
3	IGNITION SIGNAL
4	CAN BUS LOW
5	VEHICLE SPEED
6	VEHICLE SPEED (NEG. REF.)
7	EPAS SYSTEM FAULT SIGNAL
8	CAN BUS HIGH

POWER STEERING ASSEMBLY (P/N 2411530)

RIGHT HANDLEBAR SWITCH ASSEMBLY

KEY SWITCH (P/N 4012166)

	A	B	C	D	E	F
OFF						
ON LIGHTS						
ON						
START						

POD ACC GROUND

12V RECEPTACLE (P/N 4010438)

POD ACC B+

LEFT HANDLEBAR SWITCH ASSY (P/N 4012455)

	A	B	C	D	E	F	G	H	J	K	L	M	N	P
LOW BEAM														
HI BEAM														
FLASH PASS														
L TURN														
R TURN														
REV OVERRIDE														
HAZARD														
HORN														
RUN														

LED FLASHER MODULE (P/N 4013943)

1. HAZARD
2. IGNITION
3. DRL-RIGHT
4. DRL-LEFT
5. GROUND
6. LOAD TYPE
7. REAR RIGHT
8. FRONT RIGHT
9. RIGHT TURN
10. LEFT TURN
11. FRONT LEFT
12. REAR LEFT

SPLICE, GROUND HEADLIGHT

SPLICE, ACCESSORY

SPLICE, CAN LOW

SPLICE, CAN HIGH

SPLICE, GROUND POD

SPLICE, GROUND FRONT

SPLICE, HIGH BEAM

SPLICE, LOW BEAM

SPLICE, UNSWITCHED FUSE B+

CHASSIS DIODE (P/N 2410000)

SPLICE, LIGHTS B+

SPLICE, R/S B+

SPLICE, B+ UNSWITCHED

SPLICE, B+ SWITCHED

SPLICE, DRIVE

FUEL PUMP

TANK LEVEL	RESISTANCE (Ω)
FULL	6.0±1.5Ω
EMPTY	90.0±4.5Ω

PIN	FUNCTION
1	FUEL LEVEL SENSOR "+"
2	FUEL LEVEL SENSOR "-"
3	FUEL PUMP "+"
4	FUEL PUMP "-"

FUEL PUMP/LEVEL

FAN MOTOR

AMO HUB COIL

AMO COIL 24Ω

THERMISTOR (P/N 4010644)

NOMINAL RESISTANCE: AT 20 °C±2.5 KΩ±5% AT 100 °C±0.184 KΩ±2%

T-MAP (P/N 2411528)

PRESSURE SENSOR	1 GROUND 2 NTC 3 +5V 4 OUTPUT SIGNAL

TPS 4-6 Ω±5%

IGNITION COIL (P/N 4011834)

PRIMARY 0.62Ω±15%
SECONDARY 1.6KΩ±15%

TRIM FLUSH

IDLE AIR CONTROL

RESISTANCE BETWEEN PINS	
PINS	RESISTANCE
1-2	35Ω±8.2Ω
2-3	35Ω±8.2Ω
1-3	65Ω±8.4Ω
4-5	35Ω±8.2Ω
5-6	35Ω±8.2Ω
4-6	65Ω±8.4Ω
ALL OTHER COMBINATIONS:OPEN	

INJECTOR DRIVER

RESISTANCE: 12Ω±0.5Ω FUEL INJECTOR

TEMP	RESISTANCE
68 °F, 25 °C	2.5KΩ

CRANK POSITION SENSOR

SPLICE, CPS SHIELD

CIRCUIT BREAKER P/N 2410492 10 AMP

SPLICE, FUSIBLE #1

SPLICE, FUSIBLE #2

SPLICE, SHIELD

SPLICE, EFI RELAY

SPEED SENSOR (LOCATED ON TRANSMISSION)

HALL SENSOR: POWER IN PIN "A"; V OUT PIN "C"; COMMON PIN "B"

BRAKE DIODE (P/N 2411535) 6A DIODE

SPLICE, ECM SIGNAL GROUND

TRANSMISSION SWITCH P/N 7661995

HIGH	620Ω
LOW	350Ω
NEU	160Ω
REV	75Ω
PARK	24Ω

SPLICE, GROUND REAR

STATOR (P/N 4013970) (P/N 4013969)

TO UNIT

YELLOW
YELLOW
YELLOW

REG

Battery

REGULATOR (4014543)

START SOLENOID

STARTER MOTOR

BATTERY VOLTAGE: 12V

B+ TERMINAL BLOCK (P/N 4013852)

GROUND A

GROUND B

BRAKE SWITCH (P/N 4010372)

LH STOP/TAIL/TURN LIGHT (P/N 2410528) (BULB/LIGHT SOCKET SERVICE P/N 4011122) (TURN LIGHT BULB SERVICE P/N 4011173)

RH STOP/TAIL/TURN LIGHT (P/N 2410529) (BULB/LIGHT SOCKET SERVICE P/N 4011122) (TURN LIGHT BULB SERVICE P/N 4011173)

LICENSE PLATE

HARNESS-MAIN,SPMN 570 EPS INTL

WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.

E = ENGINE GROUND

C = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
4014424-680	SGT	13.0	RD	SOLENOID B+	1	SOLENOID B+	1	TBD	1
4014535-SOL	SGT	13.0	RD	B+	1	B+	1	TBD	2
4014535-TB	SGT	13.0	BK	B+	1	B+	1	TBD	3
4014546-START	SGT	13.0	BK	GND	1	GND	1	TBD	4
4014546-TB	SGT	13.0	BK	GND	1	GND	1	TBD	5
BAA	FUSIBLE LINK	1.0	BK	BATTERY PLUS #1	1	SPLICE, FUSIBLE #1	1	UNSWITCHED, B+	6
BAB	TXL	3.0	RD	SPLICE, FUSIBLE #1	2	LOAD CENTER	35	UNSWITCHED, B+	7
BBA	FUSIBLE LINK	0.8	BU	BATTERY PLUS #1	1	SPLICE, FUSIBLE #2	2	UNSWITCHED,B+	8
BBB	TXL	2.0	RD	SPLICE, FUSIBLE #2	1	SPLICE, B+ UNSWITCHED	1	UNSWITCHED, B+	9
BBC	TXL	0.8	RD	LOAD CENTER	36	SPLICE, B+ UNSWITCHED	1	UNSWITCHED B+, HAZARD FUSE	10
BBD	TXL	2.0	RD	LOAD CENTER	28	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	11
BBE	TXL	0.5	RD	LOAD CENTER	20	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	12
BBF	TXL	2.0	RD	LOAD CENTER	4	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	13
BBG	TXL	0.5	RD	LOAD CENTER	12	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	14
BCA	TXL	1.0	RD	BATTERY PLUS #1	1	FAN CKT BKR	1	UNSWITCHED, B+	15
CBA	TXL	1.0	RD/WH	LOAD CENTER	10	FAN CKT BKR	2	UNSWITCHED FUSED, B+	16
C_A227	TXL	0.5	BK	CRANK POSITION SENSOR	2	ECM	227	CRANK -	17
C_A239	TXL	0.5	WH	CRANK POSITION SENSOR	1	ECM	239	CRANK +	18
C_AC	SHLD	0.5	SHLD	SPLICE, SHIELD	1	SPLICE, CPS SHIELD	2	PRIMARY CABLE SHIELD	19
C_B255	TXL	0.5	BK	IGNITION COIL	P1	ECM	255	MAG IGNITION CONTROL	20
C_BB	TXL	0.5	WH	IGNITION COIL	P2	SPLICE, EFI RELAY	2	PTO IGNITION CONTROL	21
C_BC	SHLD	0.35	SHLD	TRIM FLUSH	-	SPLICE, SHIELD	2	PRIMARY CABLE SHIELD	22
E202	TXL	0.5	DG/YE	ECM	202	LOAD CENTER	6	EFI RELAY COIL GROUND	23
E204	TXL	0.5	OG/YE	ECM	204	LOAD CENTER	14	FAN RELAY COIL GROUND	24
E205	TFE	0.5	BU	ECM	205	INJECTOR DRIVER	1	MAG INJECTOR CONTROL	25
E206	TFE	0.5	OG	TPS	3	ECM	206	5V TO TPS	26
E207	TFE	0.5	OG	ECM	207	TMAP	3	5V B+ MAP	27
E210	TFE	0.5	DG	TPS	2	ECM	210	TPS SIGNAL	28
E211	TXL	0.5	GY/OG	ECM	211	LEFT HAND CONTROL	E	REVERSE OVERRIDE	29
E217	TXL	0.5	BN/WH	AWD	B	ECM	217	AWD CONTROL	30
E219	TXL	0.5	DG/YE	ECM	219	LOAD CENTER	22	FUEL PUMP, COIL -	31
E222	TFE	0.5	YE	TMAP	4	ECM	222	PRESSURE SENSOR	32
E223	TXL	0.5	WH	ECM	223	TRANSMISSION SWITCH	B	TRANSMISSION SIGNAL OUTPUT	33
E224	TFE	0.5	BU	TMAP	2	ECM	224	AIR TEMP SENSOR	34
E225	TFE	0.5	RD	ECM	225	IAC	3	IAC DRIVE B	35
E226	TFE	0.5	BK	IAC	4	ECM	226	IAC DRIVE A	36
E228	TXL	0.5	GY	RIGHT HAND CONTROL	4	ECM	228	AWD REQUEST	37
E230A	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	1	ECM	230	ECM SIGNAL GROUND	38
E230B	TXL	0.5	VT	COOLANT TEMP SENSOR	1	SPLICE, ECM SIGNAL GROUND	1	ECM SIGNAL GROUND	39
E230C	TXL	0.5	VT	RIGHT HAND CONTROL	2	SPLICE, ECM SIGNAL GROUND	1	ECM SIGNAL GROUND	40
E230D	TXL	0.5	VT	TRANSMISSION SWITCH	A	SPLICE, ECM SIGNAL GROUND	2	ECM SIGNAL GROUND	41
E231	TFE	0.5	VT	TPS	1	ECM	231	TPS GROUND	42
E232	TXL	0.5	PK/WH	RIGHT HAND CONTROL	1	ECM	232	THROTTLE SAFETY SWITCH	43
E236A	TXL	0.5TP	YE	SPLICE, CAN HIGH	1	ECM	236	CAN HIGH	44
E236B	TXL	0.5TP	YE	SPLICE, CAN HIGH	1	DIAGNOSTIC	H	CAN HIGH	45
E236C	TXL	0.5TP	YE	SPEEDOMETER	1	SPLICE, CAN HIGH	1	CAN HIGH	46
E236D	TXL	0.5TP	YE	SPLICE, CAN HIGH	2	EPS SIGNAL	B	CAN HIGH, EPS	47
E237	TFE	0.5	DG	IAC	1	ECM	237	IAC DRIVE C	48
E238	TFE	0.5	BU	IAC	6	ECM	238	IAC DRIVE D	49
E242	TFE	0.5	VT	TMAP	1	ECM	242	SENSOR RETURN, T-MAP	50
E244	TXL	0.5	YE	ECM	244	COOLANT TEMP SIGNAL	2	COOLANT TEMP SIGNAL	51
E245	TXL	0.5	GN/RD	SPEED SENSOR	C	ECM	245	GROUND SPEED SIGNAL	52
E248A	TXL	0.5TP	DG	SPLICE, CAN LOW	2	ECM	248	CAN LOW	53
E248B	TXL	0.5TP	DG	SPLICE, CAN LOW	1	DIAGNOSTIC	G	CAN LOW	54
E248C	TXL	0.5TP	DG	SPLICE, CAN LOW	1	SPEEDOMETER	2	CAN LOW	55
E248D	TXL	0.5TP	DG	SPLICE, CAN LOW	2	EPS SIGNAL	A	CAN LOW, EPS	56
FAA	TXL	1.0	OG/WH	SPLICE, ACCESSORY	1	LOAD CENTER	31	ACC FUSE POWER OUT	57
FAB	TXL	1.0	OG/WH	SPLICE, ACCESSORY	1	BULKHEAD ACCESSORY 1 B+	1	FUSE ACCESSORIES, B+	58
FAC	TXL	1.0	OG/WH	SPLICE, ACCESSORY	2	BULKHEAD ACCESSORY 2 B+	1	FUSE ACCESSORIES, B+	59
FAD	TXL	0.8	OG/WH	SPLICE, ACCESSORY	2	POD ACC B+	1	FUSE ACCESSORIES, B+	60
FDA	TXL	0.8	RD/GN	SPLICE, DRIVE	1	LOAD CENTER	23	DRIVE FUSE POWER OUT	61
FDC	TXL	0.8	RD/GN	WINCH SWITCH	1	SPLICE, DRIVE	2	WINCH SWITCH POWER	62
FDD	TXL	0.5	RD/GN	AWD	C	SPLICE, DRIVE	1	SWITCHED, B+	63
FDE	TXL	0.5	RD/GN	SPLICE, DRIVE	2	LEFT HAND CONTROL	C	B+ SWITCHED, HORN SUPPLY	64
FJ	TXL	1.0	RD/GN	LOAD CENTER	24	LOAD CENTER	2	EFI FUSE EFI RELAY, B+	65
FLA	TXL	2.0	RD/BN	SPLICE, LIGHTS B+	2	LOAD CENTER	15	LIGHTS FUSE POWER OUT	66
FLB	TXL	0.5	RD/BN	RH FRONT RUNNING LIGHT	1	SPLICE, LIGHTS B+	2	LIGHTS B+, RH RUNNING LIGHT	67
FLC	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	KEY SWITCH	A	LIGHTS B+	68
FLD	TXL	0.5	RD/BN	LICENSE PLATE	1	SPLICE, LIGHTS B+	2	LIGHTS B+	69
FLE	TXL	1.0	RD/BN	LOAD CENTER	26	SPLICE, LIGHTS B+	2	LIGHTS B+, LOW BEAM	70
FLF	TXL	0.5	RD/BN	SPLICE, LIGHTS B+	2	RH TAILLIGHT	1	LIGHTS B+, TAIL LIGHT	71
FLG	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	LH TAILLIGHT	1	LIGHTS B+, TAIL LIGHT	72
FLH	TXL	1.0	RD/BN	LOAD CENTER	42	SPLICE, LIGHTS B+	1	LIGHTS B+, HIGH BEAM	73
FLJ	TXL	0.5	RD/BN	HAZARD FLASHER	2	SPLICE, LIGHTS B+	1	LIGHTS B+, HAZARD IGN. INPUT	74
FLK	TXL	0.5	RD/BN	LH FRONT RUNNING LIGHT	1	SPLICE, LIGHTS B+	1	LIGHTS B+, LH RUNNING LIGHT	75
FPA	TXL	0.5	RD/GN	LOAD CENTER	16	SPLICE, FP	1	EFI RELAY, FUSED B+	76
FPB	TXL	0.5	RD/GN	LOAD CENTER	17	SPLICE, FP	1	EFI RELAY, FUSED B+	77
FPC	TXL	0.5	RD/GN	LOAD CENTER	18	SPLICE, FP	1	EFI RELAY, FUSED B+	78
FPD	TXL	0.5	RD/GN	SPLICE, FP	2	LOAD CENTER	1	KEY SWITCH B+,EFI COIL +	79
FT	TXL	3.0	RD	LOAD CENTER	34	LOAD CENTER	39	UNSWITCHED, B+	80
FUA	TXL	0.8	RD/BK	CHASSIS DIODE	P2	LOAD CENTER	32	REVERSE POLARITY DIODE ANODE	81
FUB	TXL	0.5	RD/BK	DIAGNOSTIC	A	CHASSIS DIODE	P2	UNSWITCHED FUSED, B+	82
FUD	TXL	0.5	RD/WH	CHASSIS DIODE	P1	SPLICE, UNSWITCHED FUSE B+	1	REVERSE POLARITY DIODE CATHODE	83
FUE	TXL	0.5	RD/WH	SPEEDOMETER	4	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	84
FUF	TXL	0.5	RD/WH	KEY SWITCH	C	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	85
FUG	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	LOAD CENTER	9	FAN RELAY COIL +	86
FZ	TXL	0.8	RD	LOAD CENTER	40	LEFT HAND CONTROL	F	FUSED B+, HAZARD FUSE	87
GAAA	TXL	1.0	BN	SPLICE, GROUND HEADLIGHT	2	GROUND A	1	GROUND, LEFT HEADLIGHT SPLICE	88
GAAB	TXL	0.8	BN	LEFT HEADLIGHT	P2	SPLICE, GROUND HEADLIGHT	1	GROUND	89
GAAD	TXL	0.8	BN	RIGHT HEADLIGHT	P2	SPLICE, GROUND HEADLIGHT	2	GROUND	90
GAAE	TXL	0.35	BN	LEFT FRONT TURN LAMP	2	SPLICE, GROUND HEADLIGHT	1	GROUND, LEFT FRONT TURN LIGHT	91
GAAF	TXL	0.5	BN	LH FRONT RUNNING LIGHT	2	SPLICE, GROUND HEADLIGHT	1	GROUND	92
GAAG	TXL	0.5	BN	RH FRONT RUNNING LIGHT	2	SPLICE, GROUND HEADLIGHT	2	GROUND	93
GAAH	TXL	0.35	BN	RIGHT FRONT TURN LAMP	2	SPLICE, GROUND HEADLIGHT	2	GROUND, RIGHT FRONT TURN LIGHT	94
GABA	TXL	3.0	BN	SPLICE, GROUND FRONT	2	GROUND A	1	GROUND	95
GABB	TXL	1.0	BN	SPLICE, GROUND POD	2	SPLICE, GROUND FRONT	2	GROUND	96

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SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
GABC	TXL	0.5	BN	HORN, GROUND	1	SPLICE, GROUND FRONT	2	GROUND, HORN	97
GABD	TXL	0.5	BN	SPLICE, GROUND FRONT	2	FUEL PUMP/LEVEL	2	GROUND	98
GABE	TXL	0.5	BN	LOAD CENTER	30	SPLICE, GROUND FRONT	2	GROUND, LOW BEAM COIL -	99
GABF	TXL	0.5	BN	BRAKE SWITCH	1	SPLICE, GROUND FRONT	2	LIGHTS B+	100
GABG	TXL	0.5	BN	LOAD CENTER	38	SPLICE, GROUND FRONT	2	GROUND	101
GABH	TXL	0.5	BN	LOAD CENTER	46	SPLICE, GROUND FRONT	1	GROUND, HIGH BEAM COIL -	102
GABJ	TXL	0.5	BN	SPLICE, GROUND FRONT	1	HAZARD FLASHER	5	GROUND, HAZARD FLASHER	103
GABK	TXL	0.5	BN	SPLICE, GROUND FRONT	1	HAZARD FLASHER	6	GROUND, REAR TURN SIGNAL TYPE	104
GABL	TXL	0.5	BN	DIAGNOSTIC	D	SPLICE, GROUND FRONT	1	DIAGNOSTIC, GROUND	105
GABM	TXL	0.5	BN	LEFT HAND CONTROL	M	SPLICE, GROUND POD	1	GROUND	106
GABN	TXL	0.5	BN	SPLICE, GROUND POD	1	LEFT HAND CONTROL	H	GROUND, TURN SIGNAL SUPPLY	107
GABP	TXL	0.8	BN	POD LIGHT	A	SPLICE, GROUND POD	2	GROUND,POD LIGHT (OPTIONAL)	108
GABQ	TXL	0.5	BN	SPLICE, GROUND POD	2	SPEEDOMETER	5	GROUND	109
GABR	TXL	0.8	BN	POD ACC GROUND	1	SPLICE, GROUND POD	2	GROUND	110
GABS	TXL	0.5	BN	SPLICE, GROUND POD	2	RIGHT HAND CONTROL	3	GROUND	111
GAC	TXL	0.5	BN	GROUND A	1	LOAD CENTER	8	CHASSIS RELAY COIL GROUND	112
GAD	TXL	1.0	BN	FAN	A	GROUND A	1	GROUND	113
GBA	TXL	0.5	BN	ECM	250	GROUND B	1	GROUND	114
GBB	TXL	0.5	BN	GROUND B	1	ECM	251	GROUND	115
GBC	TXL	0.5	BN	GROUND B	1	ECM	252	GROUND	116
GBD	TXL	0.5	BN	SPEED SENSOR	B	GROUND B	1	GROUND	117
GBE	TXL	0.8	BN	FUEL PUMP/LEVEL	4	GROUND B	1	GROUND	118
GBF	TXL	3.0	BN	EPS POWER	B	GROUND B	1	GROUND	119
GBGA	TXL	0.5	BN	SPLICE, SHIELD	1	GROUND B	1	GROUND	120
GBGB	TXL	0.5	BN	CRANK POSITION SENSOR	3	SPLICE, CPS SHIELD	1	CRANK POSITION SENSOR SHIELD	121
GBHA	TXL	1.0	BN	GROUND B	1	SPLICE, GROUND REAR	1	GROUND	122
GBHB	TXL	0.5	BN	LICENSE PLATE	2	SPLICE, GROUND REAR	2	GROUND, LICENSE PLATE	123
GBHC	TXL	0.35	BN	RIGHT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND, RIGHT REAR TURN LIGHT	124
GBHD	TXL	0.8	BN	RH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	125
GBHE	TXL	0.8	BN	LH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	126
GBHF	TXL	0.35	BN	LEFT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND, LEFT REAR TURN LAMP	127
H01	TXL	0.5	BU	LEFT HAND CONTROL	N	HAZARD FLASHER	1	HAZARD INPUT	128
H03	TXL	0.5	DB/WH	HAZARD FLASHER	3	SPEEDOMETER	6	RIGHT TURN INDICATOR	129
H04	TXL	0.5	BU/WH	HAZARD FLASHER	4	SPEEDOMETER	7	LEFT TURN INDICATOR	130
H07	TXL	0.35	DB/YE	HAZARD FLASHER	7	RIGHT REAR TURN LAMP	1	RIGHT REAR TURN SIGNAL	131
H08	TXL	0.35	DB/OG	HAZARD FLASHER	8	RIGHT FRONT TURN LAMP	1	RIGHT FRONT TURN SIGNAL	132
H09	TXL	0.5	DB/RD	LEFT HAND CONTROL	J	HAZARD FLASHER	9	LEFT TURN SIGNAL COMMAND	133
H10	TXL	0.5	BU/RD	LEFT HAND CONTROL	B	HAZARD FLASHER	10	LEFT TURN SIGNAL COMMAND	134
H11	TXL	0.35	BU/OG	HAZARD FLASHER	11	LEFT FRONT TURN LAMP	1	LEFT FRONT TURN SIGNAL	135
H12	TXL	0.35	BU/YE	HAZARD FLASHER	12	LEFT REAR TURN LAMP	1	LEFT REAR TURN SIGNAL	136
KB	TXL	0.5	BU/YE	KEY SWITCH	B	START SOLENOID	1	START SIGNAL	137
KDA	TXL	0.5	RD/BK	KEY SWITCH	D	LEFT HAND CONTROL	D	KEY SWITCH B+, RUN/STOP SUPPLY	138
KDB	TXL	0.5	OG	LEFT HAND CONTROL	L	SPLICE, R/S B+	1	RUN/STOP SIGNAL, R/S SPLICE B+	139
KDC	TXL	0.5	OG	SPLICE, R/S B+	1	DIAGNOSTIC	B	KEY SWITCH B+,DIAGNOSTIC	140
KDD	TXL	0.5	OG	SPEEDOMETER	3	SPLICE, R/S B+	1	KEY SWITCH B+,SPEEDOMETER	141
KDE	TXL	0.5	OG	SPLICE, R/S B+	2	EPS SIGNAL	3	KEY SWITCH B+	142
KDF	TXL	0.5	OG	SPLICE, R/S B+	2	LOAD CENTER	33	KEY SWITCH B+,EPS COIL +	143
KDG	TXL	0.5	OG	LOAD CENTER	3	SPLICE, R/S B+	2	CHASSIS RELAY COIL POWER	144
KDH	TXL	0.5	OG	SPEED SENSOR	A	SPLICE, R/S B+	2	KEY SWITCH B+,SPEED SENSOR	145
KDJ	TXL	0.5	OG	SPLICE, R/S B+	2	ECM	209	KEY SWITCH B+,ECM B+	146
KE	TXL	0.5	YE/DG	KEY SWITCH	E	LEFT HAND CONTROL	A	KEY SWITCH B+, LIGHTS/START B+	147
RCA	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	7	SWITCHED, B+	148
RCB	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	11	SWITCHED, B+	149
RCC	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	19	SWITCHED, B+	150
RCD	TXL	1.0	WH	SPLICE, B+ SWITCHED	1	LOAD CENTER	27	SWITCHED, B+	151
RF	TXL	1.0	OG/BK	FAN	B	LOAD CENTER	13	FAN RELAY POWER OUT	152
RJA	TXL	1.0	RD/BU	SPLICE, EFI RELAY	1	LOAD CENTER	5	EFI RELAY POWER OUT	153
RJB	TXL	1.0	RD/BU	ECM	253	SPLICE, EFI RELAY	1	EFI RELAY, B+	154
RJC	TFE	0.8	RD	INJECTOR DRIVER	2	SPLICE, EFI RELAY	2	EFI RELAY, B+	155
RLA	TXL	1.0	DG	LOAD CENTER	29	SPLICE, LOW BEAM	1	LOW BEAM B+	156
RLB	TXL	0.8	DG	LEFT HEADLIGHT	P3	SPLICE, LOW BEAM	1	LOW BEAM B+	157
RLC	TXL	0.8	DG	SPLICE, LOW BEAM	2	RIGHT HEADLIGHT	P3	LOW BEAM B+	158
RMA	TXL	1.0	RD	LOAD CENTER	45	SPLICE, HIGH BEAM	1	HIGH BEAM B+	159
RMB	TXL	0.8	YE	SPLICE, HIGH BEAM	2	POD LIGHT	B	HIGH BEAM B+, POD LIGHT (OPTIONAL)	160
RMC	TXL	0.8	YE	RIGHT HEADLIGHT	P1	SPLICE, HIGH BEAM	2	HIGH BEAM B+, RIGHT HEADLIGHT	161
RMD	TXL	0.5	YE	SPLICE, HIGH BEAM	2	SPEEDOMETER	B	HIGH BEAM SIGNAL	162
RME	TXL	0.8	YE	SPLICE, HIGH BEAM	1	LEFT HEADLIGHT	P1	HIGH BEAM B+, LEFT HEADLIGHT	163
RP	TXL	0.8	RD/BU	FUEL PUMP/LEVEL	3	LOAD CENTER	21	EFI RELAY, B+	164
RT	TXL	3.0	OG	EPS POWER	A	LOAD CENTER	37	EPS RELAY SWITCHED POWER	165
S11	TXL	0.5	VT/WH	FUEL PUMP/LEVEL	1	SPEEDOMETER	11	FUEL SENSOR	166
XBA	TXL	0.5	BN/WH	BRAKE SWITCH	2	BRAKE DIODE	2	BRAKE SIGNAL	167
XBB	TXL	0.5	BN/WH	BRAKE DIODE	2	START SOLENOID	2	START RELAY ENABLE	168
XBC	TXL	0.5	BN/WH	BRAKE DIODE	1	LH TAILLIGHT	3	BRAKE SIGNAL	169
XBD	TXL	0.5	BN/WH	BRAKE DIODE	1	RH TAILLIGHT	3	BRAKE SIGNAL	170
XH	TXL	0.5	YE	LEFT HAND CONTROL	P	LOAD CENTER	41	HIGH BEAM SIGNAL	171
XL	TXL	0.5	DG	LEFT HAND CONTROL	G	LOAD CENTER	25	LOW BEAM SIGNAL	172
XN	TXL	0.8	GY/RD	LEFT HAND CONTROL	K	HORN SIGNAL	1	HORN SUPPLY	173

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WIRE PREFIX LEGEND	
WIRE PREFIX	FUNCTION
B	BATTERY VOLTAGE WHEN BATTERY IS CONNECTED
K	BATTERY VOLTAGE WHEN KEY AND RUN/STOP SWITCHES ARE ON
G	GROUND
F	FUSE OUTPUT
FA	ACCESSORIES
FC	CHASSIS
FD	DRIVE
FE	ECM
FJ	FUEL INJECTION
FL	LIGHTS (LOW BEAM IF SEPARATE)
FM	LIGHTS, HIGH BEAM
FP	FUEL PUMP
FS	STARTER
FT	POWER STEERING
FU	UNSWITCHED
FZ	HAZARD
R	RELAY OUTPUT
RA	ACCESSORIES
RB	BATTERY
RC	CHASSIS
RE	ECM
RF	FAN
RJ	FUEL INJECTION
RL	LIGHTS, LOW BEAM
RM	LIGHTS, HIGH BEAM
RP	FUEL PUMP
RS	STARTER
RT	POWER STEERING
X	SWITCH OUTPUT
XB	BRAKE
XC	ADC or ADC/AWD 2
XD	AWD or ADC/AWD 1
XH	HIGH BEAM
XL	LOW BEAM
XT	TURF
XWH	HANDWARMER HIGH
XWL	HANDWARMER LOW
XWT	THUMBWARMER
XN	HORN
XS	START COMMAND
XTL	TURN SIGNAL LEFT
XTR	TURN SIGNAL RIGHT
XR	REVERSE COMMAND
XV	REVERSE OVERRIDE COMMAND
XZ	HAZARD
E	ECM PIN NUMBER
S	SPEEDOMETER PIN NUMBER
CB	CIRCUIT BREAKER OUTPUT
H	HAZARD/TURN FLASHER PIN NUMBER
A	ABS ECU
BUS	INTERNAL BUSS IN THE LOAD CENTER
NUMBER	MISCELLANEOUS

HARNESS-MAIN,SPMN 570 TOUR

WIRE COLOR LEGEND	
BK	BLACK (TAN)
BL	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
GN	GRAY
OR	ORANGE
PK	LIGHT GREEN
DG	DARK GREEN
RD	RED
PR	PINK
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN STRACE COLORS. EXAMPLE CBD/YE = RED WITH YELLOW TRACE.

▽ = ENGINE GROUND

▽ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

DIAGNOSTIC

WINCH SWITCH

BULKHEAD ACCESSORY 1 8+

BULKHEAD ACCESSORY 2 8+

LH HEADLIGHT (P/N 2410615) (HEADLIGHT BULB SERVICE P/N 4010553)

POD LIGHT P/N 2410614

SPEEDOMETER

RH HEADLIGHT (P/N 2410616) (HEADLIGHT BULB SERVICE P/N 4010553)

RIGHT HANDLEBAR SWITCH ASSEMBLY

KEY SWITCH (P/N 4012683)

POD ACC GROUND

12V RECEPTACLE (P/N 4010438)

POD ACC B+

SPLICE, ACCESSORY

LEFT HANDLEBAR SWITCH ASSEMBLY (P/N 4011835)

LHC CONN A

LHC CONN B

SPLICE, GROUND FRONT

SPLICE, GROUND POD

SPLICE, CAN LOW

SPLICE, CAN HIGH

SPLICE, HIGH BEAM

SPLICE, LOW BEAM

SPLICE, B+ UNSWITCHED

SPLICE, B+ SWITCHED

SPLICE, LIGHTS B+

SPLICE, UNSWITCHED FUSE B+

CHASSIS DIODE (P/N 2410000)

SPLICE, R/S B+

SPLICE, DRIVE

FUEL PUMP

TANK LEVEL	RESISTANCE (Ω)
FULL	6.2@1.3Ω
EMPTY	90.2@4.3Ω

PIN	FUNCTION
1	FUEL LEVEL SENSOR "+"
2	FUEL LEVEL SENSOR "-"
3	FUEL PUMP "+"
4	FUEL PUMP "-"

FUEL PUMP/LEVEL

FAN MOTOR

THERMISTOR (P/N 4010644)

NOMINAL RESISTANCE: 1 AT 20 °C±2.5 KΩ±5% AT 100 °C±0.184 KΩ±2%

T-MAP (P/N 2411528)

PRESSURE SENSOR

1 GROUND
2 NTC
3 +5V
4 OUTPUT SIGNAL

TPS (P/N 4010645)

IDLE AIR CONTROL

RESISTANCE BETWEEN PINS	
PINS	RESISTANCE
1-2	35Ω±0.1Ω
2-3	35Ω±0.1Ω
1-3	60Ω±2.4Ω
4-5	35Ω±0.1Ω
5-6	35Ω±0.1Ω
4-6	60Ω±2.4Ω
ALL OTHER COMBINATIONS OPEN	

TEMP RESISTANCE
-40 °F 32 °F 212 °F
CRANK POSITION SENSOR

CIRCUIT BREAKER 10 AMP P/N 2410692

SPLICE, CPS SHIELD

SPLICE, FUSIBLE #2

SPLICE, SHIELD

SPLICE, EFI RELAY

IGNITION COIL (P/N 4011834)

PRIMARY R:0.42Ω±15% SECONDARY 7.46Ω±15%

TRIM FLUSH

INJECTOR DRIVER

RESISTANCE: 12Ω@5V FUEL INJECTOR

SPEED SENSOR

HALL SENSOR
POWER IN PIN "A"
V-OUT PIN "C"
COMMON PIN "B"

(LOCATED ON TRANSMISSION)

BRAKE DIODE (P/N 2411035) 6A 5100E

SPLICE, ECM SIGNAL GROUND

TRANSMISSION SWITCH P/N 7661999

HIGH	420Ω
LOW	302Ω
NEU	180Ω
REV	76Ω
PARK	24Ω

SPLICE, GROUND REAR

AMD HUB COIL

AMD COIL 24Ω

STATOR (P/N 4013970) (FLYWHEEL P/N 4013969)

TO UNIT

YELLOW
YELLOW
YELLOW

REG

BATTERY

REGULATOR (4014405)

START SOLENOID

STARTER MOTOR

BATTERY VOLTAGE: 12V

B+ TERMINAL BLOCK (P/N 4013982)

GND TERMINAL BLOCK (P/N 4013982)

BRAKE SWITCH ON JUNCTION BLOCK

LH TAILLIGHT (P/N 2411153) (TAILLIGHT SOCKET SERVICE P/N 4011101) (TAILLIGHT BULB SERVICE P/N 4012764)

RH TAILLIGHT (P/N 2411154) (TAILLIGHT SOCKET SERVICE P/N 4011101) (TAILLIGHT BULB SERVICE P/N 4012764)

REAR ACCESSORY

HARNESS-MAIN,SPMN 570 TOUR

WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.

E = ENGINE GROUND

C = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
4014424-820	SGT	13.0	RD	SOLENOID B+	1	SOLENOID B+	1	TBD	1
4014535-SOL	SGT	13.0	RD	B+	1	B+	1	TBD	2
4014535-TB	SGT	13.0	RD	B+	1	B+	1	TBD	3
4014547-START	SGT	13.0	BK	GND	1	GND	1	TBD	4
4014547-TB	SGT	13.0	BK	GND	1	GND	1	TBD	5
BBA	FUSIBLE LINK	0.8	BU	BATTERY PLUS #1	1	SPLICE, FUSIBLE #2	2	UNSWITCHED,B+	6
BBB	TXL	2.0	RD	SPLICE, FUSIBLE #2	1	SPLICE, B+ UNSWITCHED	1	UNSWITCHED, B+	7
BBD	TXL	2.0	RD	LOAD CENTER	28	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	8
BBE	TXL	0.5	RD	LOAD CENTER	20	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	9
BBF	TXL	2.0	RD	LOAD CENTER	4	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	10
BBG	TXL	0.5	RD	LOAD CENTER	12	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	11
BCA	TXL	1.0	RD	BATTERY PLUS #1	1	FAN CKT BKR	1	UNSWITCHED, B+	12
CBA	TXL	1.0	RD/WH	LOAD CENTER	10	FAN CKT BKR	2	UNSWITCHED FUSED, B+	13
C_A227	TXL	0.5	BK	CRANK POSITION SENSOR	2	ECM	227	CRANK -	14
C_A239	TXL	0.5	WH	CRANK POSITION SENSOR	1	ECM	239	CRANK +	15
C_AC	SHLD	0.5	SHLD	SPLICE, SHIELD	1	SPLICE, CPS SHIELD	2	CRANK POSITION SENSOR SHIELD	16
C_B255	TXL	0.5	BK	IGNITION COIL	P1	ECM	255	MAG IGNITION CONTROL	17
C_BB	TXL	0.5	WH	IGNITION COIL	P2	SPLICE, EFI RELAY	2	PTO IGNITION CONTROL	18
C_BC	SHLD	0.35	SHLD	TRIM FLUSH	-	SPLICE, SHIELD	2	PRIMARY CABLE SHIELD	19
E202	TXL	0.5	DG/YE	ECM	202	LOAD CENTER	6	EFI RELAY COIL GROUND	20
E204	TXL	0.5	OG/YE	ECM	204	LOAD CENTER	14	FAN RELAY COIL GROUND	21
E205	TFE	0.5	BU	ECM	205	INJECTOR DRIVER	1	MAG INJECTOR CONTROL	22
E206	TFE	0.5	OG	TPS	3	ECM	206	5V TO TPS	23
E207	TFE	0.5	OG	ECM	207	TMAP	3	5V B+ MAP	24
E210	TFE	0.5	DG	TPS	2	ECM	210	TPS SIGNAL	25
E211	TXL	0.5	GY/OG	ECM	211	LHC CONR B	B	REVERSE OVERRIDE	26
E217	TXL	0.5	BN/WH	AWD	B	ECM	217	AWD CONTROL	27
E219	TXL	0.5	DG/YE	ECM	219	LOAD CENTER	22	FUEL PUMP, COIL -	28
E222	TFE	0.5	YE	TMAP	4	ECM	222	PRESSURE SENSOR	29
E223	TXL	0.5	WH	ECM	223	TRANSMISSION SWITCH	B	TRANSMISSION SIGNAL OUTPUT	30
E224	TFE	0.5	BU	TMAP	2	ECM	224	AIR TEMP SENSOR	31
E225	TFE	0.5	RD	IAC	3	ECM	225	IAC DRIVE B	32
E226	TFE	0.5	BK	IAC	4	ECM	226	IAC DRIVE A	33
E228	TXL	0.5	GY	RIGHT HAND CONTROL	4	ECM	228	AWD REQUEST	34
E230A	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	1	ECM	230	ECM SIGNAL GROUND	35
E230B	TXL	0.5	VT	COOLANT TEMP SENSOR	1	SPLICE, ECM SIGNAL GROUND	1	ECM SIGNAL GROUND	36
E230C	TXL	0.5	VT	RIGHT HAND CONTROL	2	SPLICE, ECM SIGNAL GROUND	1	ECM SIGNAL GROUND	37
E230D	TXL	0.5	VT	TRANSMISSION SWITCH	A	SPLICE, ECM SIGNAL GROUND	2	ECM SIGNAL GROUND	38
E231	TFE	0.5	VT	TPS	1	ECM	231	TPS GROUND	39
E232	TXL	0.5	PK/WH	RIGHT HAND CONTROL	1	ECM	232	THROTTLE SAFETY SWITCH	40
E236A	TXL	0.5TP	YE	SPLICE, CAN HIGH	1	ECM	236	CAN HIGH	41
E236B	TXL	0.5TP	YE	SPLICE, CAN HIGH	1	DIAGNOSTIC	H	CAN HIGH	42
E236C	TXL	0.5TP	YE	SPEEDOMETER	1	SPLICE, CAN HIGH	1	CAN HIGH	43
E237	TFE	0.5	DG	IAC	1	ECM	237	IAC DRIVE C	44
E238	TFE	0.5	BU	IAC	6	ECM	238	IAC DRIVE D	45
E242	TFE	0.5	VT	TMAP	1	ECM	242	SENSOR RETURN, T-MAP	46
E244	TXL	0.5	YE	ECM	244	COOLANT TEMP SENSOR	2	COOLANT TEMP SIGNAL	47
E245	TXL	0.5	GN/RD	SPEED SENSOR	C	ECM	245	GROUND SPEED SIGNAL	48
E248A	TXL	0.5TP	DG	SPLICE, CAN LOW	1	ECM	248	CAN LOW	49
E248B	TXL	0.5TP	DG	SPLICE, CAN LOW	1	DIAGNOSTIC	G	CAN LOW	50
E248C	TXL	0.5TP	DG	SPLICE, CAN LOW	1	SPEEDOMETER	2	CAN LOW	51
FAA	TXL	1.0	OG/WH	SPLICE, ACCESSORY	1	LOAD CENTER	31	ACC FUSE POWER OUT	52
FAB	TXL	1.0	OG/WH	SPLICE, ACCESSORY	1	BULKHEAD ACCESSORY 1 B+	1	FUSE ACCESSORIES, B+	53
FAC	TXL	1.0	OG/WH	SPLICE, ACCESSORY	2	BULKHEAD ACCESSORY 2 B+	1	FUSE ACCESSORIES, B+	54
FAD	TXL	0.8	OG/WH	SPLICE, ACCESSORY	2	POD ACC B+	1	FUSE ACCESSORIES, B+	55
FAE	TXL	0.8	OG/WH	SPLICE, ACCESSORY	2	REAR ACCESSORY	P1	FUSE ACCESSORIES, B+	56
FDA	TXL	0.8	RD/GN	SPLICE, DRIVE	1	LOAD CENTER	23	DRIVE FUSE POWER OUT	57
FDC	TXL	0.8	RD/GN	WINCH SWITCH	1	SPLICE, DRIVE	2	WINCH SWITCH POWER	58
FDD	TXL	0.5	RD/GN	AWD	C	SPLICE, DRIVE	1	SWITCHED, B+	59
FJ	TXL	1.0	RD/GN	LOAD CENTER	24	LOAD CENTER	2	EFI FUSE EFI RELAY, B+	60
FLA	TXL	2.0	RD/BN	SPLICE, LIGHTS B+	2	LOAD CENTER	15	LIGHTS FUSE POWER OUT	61
FLB	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	KEY SWITCH	A	LIGHTS B+	62
FLC	TXL	1.0	RD/BN	LOAD CENTER	26	SPLICE, LIGHTS B+	2	LIGHTS B+, LOW BEAM	63
FLD	TXL	0.5	RD/BN	SPLICE, LIGHTS B+	2	RH TAILLIGHT	1	LIGHTS B+, TAIL LIGHT	64
FLE	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	LH TAILLIGHT	1	LIGHTS B+, TAIL LIGHT	65
FLF	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	1	LHC CONR A	D	KEY SWITCH B+, LIGHTS/START B+	66
FPA	TXL	0.5	RD/GN	LOAD CENTER	16	SPLICE, FP	1	EFI RELAY, FUSED B+	67
FPB	TXL	0.5	RD/GN	LOAD CENTER	17	SPLICE, FP	1	EFI RELAY, FUSED B+	68
FPC	TXL	0.5	RD/GN	LOAD CENTER	18	SPLICE, FP	1	EFI RELAY, FUSED B+	69
FPD	TXL	0.5	RD/GN	SPLICE, FP	2	LOAD CENTER	1	KEY SWITCH B+,EFI COIL +	70
FUA	TXL	0.8	RD/BK	CHASSIS DIODE	P2	LOAD CENTER	32	REVERSE POLARITY DIODE ANODE	71
FUB	TXL	0.5	RD/BK	DIAGNOSTIC	A	CHASSIS DIODE	P2	UNSWITCHED FUSED, B+	72
FUD	TXL	0.5	RD/WH	CHASSIS DIODE	P1	SPLICE, UNSWITCHED FUSE B+	1	REVERSE POLARITY DIODE CATHODE	73
FUE	TXL	0.5	RD/WH	SPEEDOMETER	4	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	74
FUF	TXL	0.5	RD/WH	KEY SWITCH	C	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	75
FUG	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	LOAD CENTER	9	FAN RELAY COIL +	76
GAA	TXL	0.8	BN	FUEL PUMP/LEVEL	4	GROUND A	1	GROUND	77
GABA	TXL	3.0	BN	SPLICE, GROUND FRONT	2	GROUND A	1	GROUND	78
GABB	TXL	1.0	BN	SPLICE, GROUND POD	2	SPLICE, GROUND FRONT	2	GROUND	79
GABC	TXL	0.8	BN	RIGHT HEADLIGHT	A	SPLICE, GROUND FRONT	2	GROUND	80
GABD	TXL	0.5	BN	SPLICE, GROUND FRONT	2	FUEL PUMP/LEVEL	2	GROUND	81
GABE	TXL	0.5	BN	LOAD CENTER	30	SPLICE, GROUND FRONT	2	GROUND, LOW BEAM COIL -	82
GABG	TXL	0.5	BN	DIAGNOSTIC	D	SPLICE, GROUND FRONT	1	DIAGNOSTIC, GROUND	83
GABH	TXL	0.8	BN	LEFT HEADLIGHT	A	SPLICE, GROUND FRONT	1	GROUND	84
GABJ	TXL	0.5	BN	LHC CONR B	C	SPLICE, GROUND POD	1	GROUND	85
GABK	TXL	1.0	BN	POD ACC GROUND	1	SPLICE, GROUND POD	2	GROUND	86
GABL	TXL	0.8	BN	POD LIGHT	A	SPLICE, GROUND POD	2	GROUND,POD LIGHT (OPTIONAL)	87
GABM	TXL	0.5	BN	SPLICE, GROUND POD	2	SPEEDOMETER	5	GROUND	88
GABN	TXL	0.5	BN	BRAKE SWITCH	P1	SPLICE, GROUND POD	2	LIGHTS B+	89
GABP	TXL	0.5	BN	SPLICE, GROUND POD	2	RIGHT HAND CONTROL	3	GROUND	90
GAC	TXL	0.5	BN	GROUND A	1	LOAD CENTER	8	CHASSIS RELAY COIL GROUND	91
GAD	TXL	1.0	BN	FAN	A	GROUND A	1	GROUND	92
GBA	TXL	0.5	BN	ECM	250	GROUND B	1	GROUND	93
GBB	TXL	0.5	BN	GROUND B	1	ECM	251	GROUND	94
GBC	TXL	0.5	BN	GROUND B	1	ECM	252	GROUND	95
GBD	TXL	0.5	BN	SPEED SENSOR	B	GROUND B	1	GROUND	96

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SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
GBGA	TXL	0.5	BN	SPLICE, SHIELD	1	GROUND B	1	GROUND	97
GBGB	TXL	0.5	BN	CRANK POSITION SENSOR	3	SPLICE, CPS SHIELD	1	CRANK POSITION SENSOR SHIELD	98
GBHA	TXL	1.0	BN	GROUND B	1	SPLICE, GROUND REAR	1	GROUND	99
GBHB	TXL	0.8	BN	REAR ACCESSORY	P2	SPLICE, GROUND REAR	2	GROUND	100
GBHC	TXL	0.8	BN	RH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	101
GBHD	TXL	0.8	BN	LH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	102
KB	TXL	0.5	BU/YE	KEY SWITCH	B	START SOLENOID	1	START SIGNAL	103
KDA	TXL	0.5	RD/BK	KEY SWITCH	D	LHC CONR B	F	KEY SWITCH B+, RUN/STOP SUPPLY	104
KDB	TXL	0.5	OG	LHC CONR A	C	SPLICE, R/S B+	1	RUN/STOP SIGNAL, R/S SPLICE B+	105
KDC	TXL	0.5	OG	SPLICE, R/S B+	1	DIAGNOSTIC	B	KEY SWITCH B+,DIAGNOSTIC	106
KDD	TXL	0.5	OG	SPEEDOMETER	3	SPLICE, R/S B+	1	KEY SWITCH B+,SPEEDOMETER	107
KDG	TXL	0.5	OG	LOAD CENTER	3	SPLICE, R/S B+	2	CHASSIS RELAY COIL POWER	108
KDH	TXL	0.5	OG	SPEED SENSOR	A	SPLICE, R/S B+	2	KEY SWITCH B+,SPEED SENSOR	109
KDJ	TXL	0.5	OG	SPLICE, R/S B+	2	ECM	209	KEY SWITCH B+,ECM B+	110
RCA	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	7	SWITCHED, B+	111
RCB	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	11	SWITCHED, B+	112
RCC	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	19	SWITCHED, B+	113
RCD	TXL	1.0	WH	SPLICE, B+ SWITCHED	1	LOAD CENTER	27	SWITCHED, B+	114
RF	TXL	1.0	OG/BK	FAN	B	LOAD CENTER	13	FAN RELAY POWER OUT	115
RJA	TXL	1.0	RD/BU	SPLICE, EFI RELAY	1	LOAD CENTER	5	EFI RELAY POWER OUT	116
RJB	TXL	1.0	RD/BU	ECM	253	SPLICE, EFI RELAY	1	EFI RELAY, B+	117
RJC	TFE	0.8	RD	INJECTOR DRIVER	2	SPLICE, EFI RELAY	2	EFI RELAY, B+	118
RLA	TXL	1.0	DG	LOAD CENTER	29	SPLICE, LOW BEAM	1	LOW BEAM B+	119
RLB	TXL	0.8	DG	LEFT HEADLIGHT	B	SPLICE, LOW BEAM	1	LOW BEAM B+	120
RLC	TXL	0.8	DG	SPLICE, LOW BEAM	2	RIGHT HEADLIGHT	B	LOW BEAM B+	121
RP	TXL	0.8	RD/BU	FUEL PUMP/LEVEL	3	LOAD CENTER	21	EFI RELAY, B+	122
SII	TXL	0.5	VT/WH	FUEL PUMP/LEVEL	1	SPEEDOMETER	11	FUEL SENSOR	123
XBA	TXL	0.5	BN/WH	BRAKE SWITCH	P2	BRAKE DIODE	2	BRAKE SIGNAL	124
XBB	TXL	0.5	BN/WH	BRAKE DIODE	2	START SOLENOID	2	START RELAY ENABLE	125
XBC	TXL	0.5	BN/WH	BRAKE DIODE	1	LH TAILLIGHT	3	BRAKE SIGNAL	126
XBD	TXL	0.5	BN/WH	BRAKE DIODE	1	RH TAILLIGHT	3	BRAKE SIGNAL	127
XHA	TXL	0.5	YE	LHC CONR A	E	SPLICE, HIGH BEAM	1	HIGH BEAM SIGNAL	128
XHB	TXL	0.5	YE	SPLICE, HIGH BEAM	2	POD LIGHT	B	HIGH BEAM B+, POD LIGHT (OPTIONAL)	129
XHC	TXL	0.5	YE	SPLICE, HIGH BEAM	2	SPEEDOMETER	8	HIGH BEAM SIGNAL	130
XL	TXL	0.5	DG	LHC CONR A	F	LOAD CENTER	25	LOW BEAM SIGNAL	131

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WIRE PREFIX LEGEND	
WIRE PREFIX	FUNCTION
B	BATTERY VOLTAGE WHEN BATTERY IS CONNECTED
K	BATTERY VOLTAGE WHEN KEY AND RUN/STOP SWITCHES ARE ON
G	GROUND
F	FUSE OUTPUT
FA	ACCESSORIES
FC	CHASSIS
FD	DRIVE
FE	ECM
FJ	FUEL INJECTION
FL	LIGHTS (LOW BEAM IF SEPARATE)
FM	LIGHTS, HIGH BEAM
FP	FUEL PUMP
FS	STARTER
FT	POWER STEERING
FU	UNSWITCHED
FZ	HAZARD
R	RELAY OUTPUT
RA	ACCESSORIES
RB	BATTERY
RC	CHASSIS
RE	ECM
RF	FAN
RJ	FUEL INJECTION
RL	LIGHTS, LOW BEAM
RM	LIGHTS, HIGH BEAM
RP	FUEL PUMP
RS	STARTER
RT	POWER STEERING
X	SWITCH OUTPUT
XB	BRAKE
XC	ADC or ADC/AWD 2
XD	AWD or ADC/AWD 1
XH	HIGH BEAM
XL	LOW BEAM
XT	TURF
XWH	HANDWARMER HIGH
XWL	HANDWARMER LOW
XWT	THUMBWARMER
XN	HORN
XS	START COMMAND
XTL	TURN SIGNAL LEFT
XTR	TURN SIGNAL RIGHT
XR	REVERSE COMMAND
XV	REVERSE OVERRIDE COMMAND
XZ	HAZARD
E	ECM PIN NUMBER
S	SPEEDOMETER PIN NUMBER
CB	CIRCUIT BREAKER OUTPUT
H	HAZARD/TURN FLASHER PIN NUMBER
A	ABS ECU
BUS	INTERNAL BUSS IN THE LOAD CENTER
NUMBER	MISCELLANEOUS

HARNESS-MAIN,SPMN 570 TOUR INTL

WIRE COLOR LEGEND	
BK	BLACK (DARK)
BL	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GN	GREEN
LG	LIGHT GREEN
DG	DARK GREEN
OR	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN STRACE COLORS. EXAMPLE (RD/YE = RED WITH YELLOW TRACE.

▽ = ENGINE GROUND

▽ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

DIAGNOSTIC

WINCH SWITCH

BULKHEAD ACCESSORY 1 B+

BULKHEAD ACCESSORY 2 B+

LH TURN SIGNAL (P/N 2411143)

LH HEADLIGHT/RUNNING LIGHT (P/N 2411142) (HEADLIGHT BULB SERVICE P/N 4011324) (RUNNING LIGHT BULB SERVICE P/N 4010340)

POD LIGHT P/N 2410614

SPEEDOMETER

RH HEADLIGHT/RUNNING LIGHT (P/N 2411143) (HEADLIGHT BULB SERVICE P/N 4011324) (RUNNING LIGHT BULB SERVICE P/N 4010340)

RH TURN SIGNAL (P/N 2411144)

HORN (P/N 4011578)

RIGHT HANDLEBAR SWITCH ASSEMBLY

KEY SWITCH (P/N 4011496)

	A	B	C	D	E
OFF					
RUN LIGHTS					
RUN					
START					

POD ACC GROUND

12V RECEPTACLE (P/N 4010383)

LEFT HANDLEBAR SWITCH ASSY (P/N 4012455)

	A	B	C	D	E	F	G	H	J	K	L	M	N	P
LOW BEAM														
HI BEAM														
FLASH PASS														
L TURN														
R TURN														
KEY OVERRIDE														
HAZARD														
HORN														
RUN														

LED FLASHER MODULE (P/N 4013043)

1. HAZARD
2. IGNITION SWITCH
3. DIL-RIGHT
4. DIL-LEFT
5. GROUND
6. LOAD TYPE
7. REAR RIGHT
8. FRONT RIGHT
9. RIGHT TURN
10. LEFT TURN
11. FRONT LEFT
12. REAR LEFT

FUEL PUMP

TANK LEVEL	RESISTANCE (Ω)
FULL	6.0±1.5Ω
EMPTY	90.0±4.5Ω

PIN	FUNCTION
1	FUEL LEVEL SENSOR "+"
2	FUEL LEVEL SENSOR "-"
3	FUEL PUMP "+"
4	FUEL PUMP "-"

FUEL PUMP/LEVEL

FAN MOTOR

THERMISTOR (P/N 4010644)

NOMINAL RESISTANCE: 1 AT 20 °C±2.5 Ω(3.0 kΩ) AT 100 °C±10.18Ω Ω(2.2

T-MAP (P/N 2411528)

PRESSURE SENSOR	1 GROUND 2 NTC 3 +5V 4 OUTPUT SIGNAL

TPS 4-6 Ω±5%

IDLE AIR CONTROL

RESISTANCE BETWEEN PINS	
PINS	RESISTANCE
1-2	35Ω±1.2Ω
2-3	35Ω±1.2Ω
1-3	65Ω±2.4Ω
4-5	35Ω±1.2Ω
5-6	35Ω±1.2Ω
4-6	65Ω±2.4Ω
ALL OTHER COMBINATIONS OPEN	

CRANK POSITION SENSOR

TEMP	RESISTANCE
70 °F 21 °C	2.5 kΩ±5%

SPLICE, CPS SHIELD

SPLICE, GROUND POD

SPLICE, GROUND FRONT

SPLICE, LOW BEAM

SPLICE, HIGH BEAM

SPLICE, GROUND HEADLIGHT

SPLICE, CAN LOW

SPLICE, CAN HIGH

SPLICE, B+ UNSWITCHED

SPLICE, ACCESSORY

SPLICE, B+ SWITCHED

SPLICE, UNSWITCHED FUSE B+

SPLICE, LIGHTS B+

SPLICE, R/S B+

CHASSIS DIODE (P/N 2410000)

SPLICE, FUSIBLE #2

SPLICE, GROUND REAR

SPLICE, SHIELD

SPLICE, EFI RELAY

SPLICE, ECM SIGNAL GROUND

SPLICE, DRIVE

CIRCUIT BREAKER 10 AMP (P/N 2410692)

BRAKE DIODE (P/N 2411035) 6A DIODE

SPEED SENSOR (LOCATED ON TRANSMISSION)

HALL SENSOR

TRANSMISSION SWITCH P/N 7661095

HIGH	420Ω ±5%
LOW	350Ω ±5%
NEU	160Ω ±5%
REV	75Ω ±5%
PARK	34Ω ±5%

AMO HUB COIL

AMO COIL 24Ω

IGNITION COIL (P/N 4011894)

PRIMARY 0.6Ω±15%
SECONDARY 1.6kΩ±15%

TRIM FLUSH

INJECTOR DRIVER

RESISTANCE: 12Ω±5%
FUEL INJECTOR

STATOR (P/N 4013970) (P/N 4013969)

TO BATTERY

REGULATOR (4014405)

START SOLENOID

STARTER MOTOR

BATTERY VOLTAGE: 12V

B+ TERMINAL BLOCK (P/N 4011892)

BRAKE SWITCH (P/N 4010723)

LH STOP/TAIL/TURN LIGHT (P/N 2410528) (STOP/TAIL LIGHT SOCKET SERVICE P/N 4011102) (TURN LIGHT SOCKET SERVICE P/N 4011173) (STOP/TAIL LIGHT BULB SERVICE P/N 4011174) (TURN LIGHT BULB SERVICE P/N 4011175)

RH STOP/TAIL/TURN LIGHT (P/N 2410529) (STOP/TAIL LIGHT SOCKET SERVICE P/N 4011102) (TURN LIGHT SOCKET SERVICE P/N 4011173) (STOP/TAIL LIGHT BULB SERVICE P/N 4011174) (TURN LIGHT BULB SERVICE P/N 4011175)

LICENSE PLATE

REAR ACCESSORY

HARNESS-MAIN,SPMN 570 TOUR INTL

WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR
TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.	

E = ENGINE GROUND

C = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
4014424-B20	SGT	13.0	RD	SOLENOID B+	I	SOLENOID B+	I	TBD	I
4014535-SOL	SGT	13.0	RD	B+	I	B+	I	TBD	2
4014535-TB	SGT	13.0	RD	B+	I	B+	I	TBD	3
4014547-START	SGT	13.0	BK	GND	I	GND	I	TBD	4
4014547-TB	SGT	13.0	BK	GND	I	GND	I	TBD	5
BBA	FUSIBLE LINK	0.8	BU	BATTERY PLUS #1	I	SPLICE, FUSIBLE #2	2	UNSWITCHED,B+	6
BBB	TXL	2.0	RD	SPLICE, FUSIBLE #2	I	SPLICE, B+ UNSWITCHED	I	UNSWITCHED, B+	7
BBC	TXL	0.8	RD	LOAD CENTER	36	SPLICE, B+ UNSWITCHED	I	UNSWITCHED B+, HAZARD FUSE	8
BBD	TXL	2.0	RD	LOAD CENTER	28	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	9
BBE	TXL	0.5	RD	LOAD CENTER	20	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	I0
BBF	TXL	2.0	RD	LOAD CENTER	4	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	II
BBG	TXL	0.5	RD	LOAD CENTER	I2	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	I2
BCA	TXL	I.0	RD	BATTERY PLUS #1	I	FAN CKT BKR	I	UNSWITCHED, B+	I3
CBA	TXL	I.0	RD/WH	LOAD CENTER	I0	FAN CKT BKR	2	UNSWITCHED FUSED, B+	I4
C_A227	TXL	0.5	BK	CRANK POSITION SENSOR	2	ECM	227	CRANK -	I5
C_A239	TXL	0.5	WH	CRANK POSITION SENSOR	I	ECM	239	CRANK +	I6
C_AC	SHLD	0.5	SHLD	SPLICE, SHIELD	I	SPLICE, CPS SHIELD	2	PRIMARY CABLE SHIELD	I7
C_B255	TXL	0.5	BK	IGNITION COIL	P1	ECM	255	MAG IGNITION CONTROL	I8
C_BB	TXL	0.5	WH	IGNITION COIL	P2	SPLICE, EFI RELAY	2	PTO IGNITION CONTROL	I9
C_BC	SHLD	0.35	SHLD	TRIM FLUSH	-	SPLICE, SHIELD	2	PRIMARY CABLE SHIELD	20
E202	TXL	0.5	DG/YE	ECM	202	LOAD CENTER	6	EFI RELAY COIL GROUND	21
E204	TXL	0.5	OG/YE	ECM	204	LOAD CENTER	I4	FAN RELAY COIL GROUND	22
E205	TFE	0.5	BU	ECM	205	INJECTOR DRIVER		MAG INJECTOR CONTROL	23
E206	TFE	0.5	OG	TPS	3	ECM	206	5V TO TPS	24
E207	TFE	0.5	OG	ECM	207	TMAP	3	5V B+ MAP	25
E210	TFE	0.5	DG	TPS	2	ECM	210	TPS SIGNAL	26
E211	TXL	0.5	GY/OG	ECM	211	LEFT HAND CONTROL	E	REVERSE OVERRIDE	27
E217	TXL	0.5	BN/WH	AWD	B	ECM	217	AWD CONTROL	28
E219	TXL	0.5	DG/YE	ECM	219	LOAD CENTER	22	FUEL PUMP, COIL -	29
E222	TFE	0.5	YE	TMAP	4	ECM	222	PRESSURE SENSOR	30
E223	TXL	0.5	WH	ECM	223	TRANSMISSION SWITCH	B	TRANSMISSION SIGNAL OUTPUT	31
E224	TFE	0.5	BU	TMAP	2	ECM	224	AIR TEMP SENSOR	32
E225	TFE	0.5	RD	ECM	225	IAC	3	IAC DRIVE B	33
E226	TFE	0.5	BK	IAC	4	ECM	226	IAC DRIVE A	34
E228	TXL	0.5	GY	RIGHT HAND CONTROL	4	ECM	228	AWD REQUEST	35
E230A	TXL	0.5	VT	SPLICE, ECM SIGNAL GROUND	I	ECM	230	ECM SIGNAL GROUND	36
E230B	TXL	0.5	VT	COOLANT TEMP SENSOR	I	SPLICE, ECM SIGNAL GROUND	I	ECM SIGNAL GROUND	37
E230C	TXL	0.5	VT	RIGHT HAND CONTROL	2	SPLICE, ECM SIGNAL GROUND	I	ECM SIGNAL GROUND	38
E230D	TXL	0.5	VT	TRANSMISSION SWITCH	A	SPLICE, ECM SIGNAL GROUND	2	ECM SIGNAL GROUND	39
E231	TFE	0.5	VT	TPS	I	ECM	231	TPS GROUND	40
E232	TXL	0.5	PK/WH	RIGHT HAND CONTROL	I	ECM	232	THROTTLE SAFETY SWITCH	41
E236A	TXL	0.5TP	YE	SPLICE, CAN HIGH	I	ECM	236	CAN HIGH	42
E236B	TXL	0.5TP	YE	SPLICE, CAN HIGH	I	DIAGNOSTIC	H	CAN HIGH	43
E236C	TXL	0.5TP	YE	SPEEDOMETER	I	SPLICE, CAN HIGH		CAN HIGH	44
E237	TFE	0.5	DG	IAC	I	ECM	237	IAC DRIVE C	45
E238	TFE	0.5	BU	IAC	6	ECM	238	IAC DRIVE D	46
E242	TFE	0.5	VT	TMAP	I	ECM	242	SENSOR RETURN, T-MAP	47
E244	TXL	0.5	YE	ECM	244	COOLANT TEMP SENSOR	2	COOLANT TEMP SIGNAL	48
E245	TXL	0.5	GN/RD	SPEED SENSOR	C	ECM	245	GROUND SPEED SIGNAL	49
E248A	TXL	0.5TP	DG	SPLICE, CAN LOW	2	ECM	248	CAN LOW	50
E248B	TXL	0.5TP	DG	SPLICE, CAN LOW	I	DIAGNOSTIC	G	CAN LOW	51
E248C	TXL	0.5TP	DG	SPLICE, CAN LOW	I	SPEEDOMETER	2	CAN LOW	52
FAA	TXL	I.0	OG/WH	SPLICE, ACCESSORY	I	LOAD CENTER	31	ACC FUSE POWER OUT	53
FAB	TXL	I.0	OG/WH	SPLICE, ACCESSORY	I	BULKHEAD ACCESSORY 1 B+	I	FUSE ACCESSORIES, B+	54
FAC	TXL	I.0	OG/WH	SPLICE, ACCESSORY	2	BULKHEAD ACCESSORY 2 B+	I	FUSE ACCESSORIES, B+	55
FAD	TXL	0.8	OG/WH	SPLICE, ACCESSORY	2	POD ACC B+	I	FUSE ACCESSORIES, B+	56
FAE	TXL	0.8	OG/WH	REAR ACCESSORY	P1	SPLICE, ACCESSORY	2	GROUND, LICENSE PLATE	57
FDA	TXL	0.8	RD/GN	SPLICE, DRIVE	I	LOAD CENTER	23	DRIVE FUSE POWER OUT	58
FDC	TXL	0.8	RD/GN	WINCH SWITCH	I	SPLICE, DRIVE	2	WINCH SWITCH POWER	59
FDD	TXL	0.5	RD/GN	AWD	C	SPLICE, DRIVE	I	SWITCHED, B+	60
FDE	TXL	0.5	RD/GN	SPLICE, DRIVE	2	LEFT HAND CONTROL	C	B+ SWITCHED, HORN SUPPLY	61
FJ	TXL	I.0	RD/GN	LOAD CENTER	24	LOAD CENTER	2	EFI FUSE EFI RELAY, B+	62
FLA	TXL	2.0	RD/BN	SPLICE, LIGHTS B+	2	LOAD CENTER	I5	LIGHTS FUSE POWER OUT	63
FLB	TXL	0.5	RD/BN	RH FRONT RUNNING LIGHT	I	SPLICE, LIGHTS B+	2	LIGHTS B+, RH RUNNING LIGHT	64
FLC	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	KEY SWITCH	A	LIGHTS B+	65
FLD	TXL	0.5	RD/BN	LICENSE PLATE	I	SPLICE, LIGHTS B+	2	LIGHTS B+	66
FLE	TXL	I.0	RD/BN	LOAD CENTER	26	SPLICE, LIGHTS B+	2	LIGHTS B+, LOW BEAM	67
FLF	TXL	0.5	RD/BN	SPLICE, LIGHTS B+	2	RH TAILLIGHT	I	LIGHTS B+, TAIL LIGHT	68
FLG	TXL	0.8	RD/BN	SPLICE, LIGHTS B+	2	LH TAILLIGHT	I	LIGHTS B+, TAIL LIGHT	69
FLH	TXL	I.0	RD/BN	LOAD CENTER	42	SPLICE, LIGHTS B+	I	LIGHTS B+, HIGH BEAM	70
FLJ	TXL	0.5	RD/BN	HAZARD FLASHER	2	SPLICE, LIGHTS B+	I	LIGHTS B+, HAZARD IGN. INPUT	71
FLK	TXL	0.5	RD/BN	LH FRONT RUNNING LIGHT	I	SPLICE, LIGHTS B+	I	LIGHTS B+, LH RUNNING LIGHT	72
FPA	TXL	0.5	RD/GN	LOAD CENTER	I6	SPLICE, FP	I	EFI RELAY, FUSED B+	73
FPB	TXL	0.5	RD/GN	LOAD CENTER	I7	SPLICE, FP	I	EFI RELAY, FUSED B+	74
FPC	TXL	0.5	RD/GN	LOAD CENTER	I8	SPLICE, FP	I	EFI RELAY, FUSED B+	75
FPD	TXL	0.5	RD/GN	SPLICE, FP	2	LOAD CENTER	I	KEY SWITCH B+,EFI COIL +	76
FUA	TXL	0.8	RD/BK	CHASSIS DIODE	P2	LOAD CENTER	32	REVERSE POLARITY DIODE ANODE	77
FUB	TXL	0.5	RD/BK	DIAGNOSTIC	A	CHASSIS DIODE	P2	UNSWITCHED FUSED, B+	78
FUD	TXL	0.5	RD/WH	CHASSIS DIODE	P1	SPLICE, UNSWITCHED FUSE B+	I	REVERSE POLARITY DIODE CATHODE	79
FUE	TXL	0.5	RD/WH	SPEEDOMETER	4	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	80
FUF	TXL	0.5	RD/WH	KEY SWITCH	C	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	81
FUG	TXL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	LOAD CENTER	9	FAN RELAY COIL +	82
FZ	TXL	0.8	RD	LOAD CENTER	40	LEFT HAND CONTROL	F	FUSED B+, HAZARD FUSE	83
GAAA	TXL	I.0	BN	SPLICE, GROUND HEADLIGHT	2	GROUND A	I	GROUND, LEFT HEADLIGHT SPLICE	84
GAAB	TXL	0.8	BN	LEFT HEADLIGHT	P2	SPLICE, GROUND HEADLIGHT	I	GROUND	85
GAAD	TXL	0.8	BN	RIGHT HEADLIGHT	P2	SPLICE, GROUND HEADLIGHT	2	GROUND	86
GAAE	TXL	0.35	BN	LEFT FRONT TURN LAMP	2	SPLICE, GROUND HEADLIGHT	I	GROUND, LEFT FRONT TURN LIGHT	87
GAAF	TXL	0.5	BN	LH FRONT RUNNING LIGHT	2	SPLICE, GROUND HEADLIGHT	I	GROUND	88
GAAG	TXL	0.5	BN	RH FRONT RUNNING LIGHT	2	SPLICE, GROUND HEADLIGHT	2	GROUND	89
GAAH	TXL	0.35	BN	RIGHT FRONT TURN LAMP	2	SPLICE, GROUND HEADLIGHT	2	GROUND, RIGHT FRONT TURN LIGHT	90
GABA	TXL	3.0	BN	SPLICE, GROUND FRONT	2	GROUND A	I	GROUND	91
GABB	TXL	I.0	BN	SPLICE, GROUND POD	2	SPLICE, GROUND FRONT	2	GROUND	92
GABC	TXL	0.5	BN	HORN, GROUND	I	SPLICE, GROUND FRONT	2	GROUND, HORN	93
GABD	TXL	0.5	BN	SPLICE, GROUND FRONT	2	FUEL PUMP/LEVEL	2	GROUND	94
GABE	TXL	0.5	BN	LOAD CENTER	30	SPLICE, GROUND FRONT	2	GROUND, LOW BEAM COIL -	95
GABF	TXL	0.5	BN	BRAKE SWITCH	I	SPLICE, GROUND FRONT	2	LIGHTS B+	96

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SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
GABH	TXL	0.5	BN	LOAD CENTER	46	SPLICE, GROUND FRONT	I	GROUND, HIGH BEAM COIL -	97
GABJ	TXL	0.5	BN	SPLICE, GROUND FRONT	I	HAZARD FLASHER	5	GROUND, HAZARD FLASHER	98
GABK	TXL	0.5	BN	SPLICE, GROUND FRONT	I	HAZARD FLASHER	6	GROUND, REAR TURN SIGNAL TYPE	99
GABL	TXL	0.5	BN	DIAGNOSTIC	D	SPLICE, GROUND FRONT	I	DIAGNOSTIC, GROUND	I00
GABM	TXL	0.5	BN	LEFT HAND CONTROL	M	SPLICE, GROUND POD	I	GROUND	I0I
GABN	TXL	0.5	BN	SPLICE, GROUND POD	I	LEFT HAND CONTROL	H	GROUND, TURN SIGNAL SUPPLY	I02
GABP	TXL	0.8	BN	POD LIGHT	A	SPLICE, GROUND POD	2	GROUND,POD LIGHT (OPTIONAL)	I03
GABQ	TXL	0.5	BN	SPLICE, GROUND POD	2	SPEEDOMETER	5	GROUND	I04
GABR	TXL	0.8	BN	POD ACC GROUND	I	SPLICE, GROUND POD	2	GROUND	I05
GABS	TXL	0.5	BN	SPLICE, GROUND POD	2	RIGHT HAND CONTROL	3	GROUND	I06
GAC	TXL	0.5	BN	GROUND A	I	LOAD CENTER	8	CHASSIS RELAY COIL GROUND	I07
GAD	TXL	I.0	BN	FAN	A	GROUND A	I	GROUND	I08
GBA	TXL	0.5	BN	ECM	250	GROUND B	I	GROUND	I09
GBB	TXL	0.5	BN	GROUND B	I	ECM	25I	GROUND	II0
GBC	TXL	0.5	BN	GROUND B	I	ECM	252	GROUND	III
GBD	TXL	0.5	BN	SPEED SENSOR	B	GROUND B	I	GROUND	II2
GBE	TXL	0.8	BN	FUEL PUMP/LEVEL	4	GROUND B	I	GROUND	II3
GBGA	TXL	0.5	BN	SPLICE, SHIELD	I	GROUND B	I	GROUND	II4
GBGB	TXL	0.5	BN	CRANK POSITION SENSOR	3	SPLICE, CPS SHIELD	I	CRANK POSITION SENSOR SHIELD	II5
GBHA	TXL	I.0	BN	GROUND B	I	SPLICE, GROUND REAR	I	GROUND	II6
GBHB	TXL	0.8	BN	REAR ACCESSORY	P2	SPLICE, GROUND REAR	2	GROUND, LICENSE PLATE	II7
GBHC	TXL	0.5	BN	LICENSE PLATE	2	SPLICE, GROUND REAR	2	GROUND, LICENSE PLATE	II8
GBHD	TXL	0.35	BN	RIGHT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND, RIGHT REAR TURN LIGHT	II9
GBHE	TXL	0.8	BN	RH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	I20
GBHF	TXL	0.8	BN	LH TAILLIGHT	2	SPLICE, GROUND REAR	2	GROUND	I2I
GBHG	TXL	0.35	BN	LEFT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND, LEFT REAR TURN LAMP	I22
H01	TXL	0.5	BU	LEFT HAND CONTROL	N	HAZARD FLASHER	I	HAZARD INPUT	I23
H03	TXL	0.5	DB/WH	HAZARD FLASHER	3	SPEEDOMETER	6	RIGHT TURN INDICATOR	I24
H04	TXL	0.5	BU/WH	HAZARD FLASHER	4	SPEEDOMETER	7	LEFT TURN INDICATOR	I25
H07	TXL	0.35	DB/YE	HAZARD FLASHER	7	RIGHT REAR TURN LAMP	I	RIGHT REAR TURN SIGNAL	I26
H08	TXL	0.35	DB/OG	HAZARD FLASHER	8	RIGHT FRONT TURN LAMP	I	RIGHT FRONT TURN SIGNAL	I27
H09	TXL	0.5	DB/RD	LEFT HAND CONTROL	J	HAZARD FLASHER	9	LEFT TURN SIGNAL COMMAND	I28
H10	TXL	0.5	BU/RD	LEFT HAND CONTROL	B	HAZARD FLASHER	I0	LEFT TURN SIGNAL COMMAND	I29
H11	TXL	0.35	BU/OG	HAZARD FLASHER	II	LEFT FRONT TURN LAMP	I	LEFT FRONT TURN SIGNAL	I30
H12	TXL	0.35	BU/YE	HAZARD FLASHER	I2	LEFT REAR TURN LAMP	I	LEFT REAR TURN SIGNAL	I3I
KB	TXL	0.5	BU/YE	KEY SWITCH	B	START SOLENOID	I	START SIGNAL	I32
KDA	TXL	0.5	RD/BK	KEY SWITCH	D	LEFT HAND CONTROL	D	KEY SWITCH B+, RUN/STOP SUPPLY	I33
KDB	TXL	0.5	OG	LEFT HAND CONTROL	L	SPLICE, R/S B+	I	RUN/STOP SIGNAL, R/S SPLICE B+	I34
KDC	TXL	0.5	OG	SPLICE, R/S B+	I	DIAGNOSTIC	B	KEY SWITCH B+,DIAGNOSTIC	I35
KDD	TXL	0.5	OG	SPEEDOMETER	3	SPLICE, R/S B+	I	KEY SWITCH B+,SPEEDOMETER	I36
KDG	TXL	0.5	OG	LOAD CENTER	3	SPLICE, R/S B+	2	CHASSIS RELAY COIL POWER	I37
KDH	TXL	0.5	OG	SPEED SENSOR	A	SPLICE, R/S B+	2	KEY SWITCH B+,SPEED SENSOR	I38
KDJ	TXL	0.5	OG	SPLICE, R/S B+	2	ECM	209	KEY SWITCH B+,ECM B+	I39
KE	TXL	0.5	YE/OG	KEY SWITCH	E	LEFT HAND CONTROL	A	KEY SWITCH B+, LIGHTS/START B+	I40
RCA	TXL	I.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	7	SWITCHED, B+	I4I
RCB	TXL	I.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	II	SWITCHED, B+	I42
RCC	TXL	I.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	I9	SWITCHED, B+	I43
RCD	TXL	I.0	WH	SPLICE, B+ SWITCHED	I	LOAD CENTER	27	SWITCHED, B+	I44
RF	TXL	I.0	OG/BK	FAN	B	LOAD CENTER	I3	FAN RELAY POWER OUT	I45
RJA	TXL	I.0	RD/BU	SPLICE, EFI RELAY	I	LOAD CENTER	5	EFI RELAY POWER OUT	I46
RJB	TXL	I.0	RD/BU	ECM	Z53	SPLICE, EFI RELAY	I	EFI RELAY, B+	I47
RJC	TFE	0.8	RD	INJECTOR DRIVER	2	SPLICE, EFI RELAY	2	TBD	I48
RLA	TXL	I.0	DG	LOAD CENTER	Z9	SPLICE, LOW BEAM	I	LOW BEAM B+	I49
RLB	TXL	0.8	DG	LEFT HEADLIGHT	P3	SPLICE, LOW BEAM	I	LOW BEAM B+	I50
RLC	TXL	0.8	DG	SPLICE, LOW BEAM	2	RIGHT HEADLIGHT	P3	LOW BEAM B+	I5I
RMA	TXL	I.0	RD	LOAD CENTER	45	SPLICE, HIGH BEAM	I	HIGH BEAM B+	I52
RMB	TXL	0.8	YE	SPLICE, HIGH BEAM	2	POD LIGHT	B	HIGH BEAM B+, POD LIGHT (OPTIONAL)	I53
RMC	TXL	0.8	YE	RIGHT HEADLIGHT	P1	SPLICE, HIGH BEAM	2	HIGH BEAM B+, RIGHT HEADLIGHT	I54
RMD	TXL	0.5	YE	SPLICE, HIGH BEAM	2	SPEEDOMETER	8	HIGH BEAM SIGNAL	I55
RME	TXL	0.8	YE	SPLICE, HIGH BEAM	I	LEFT HEADLIGHT	P1	HIGH BEAM B+, LEFT HEADLIGHT	I56
RP	TXL	0.8	RD/BU	FUEL PUMP/LEVEL	3	LOAD CENTER	2I	EFI RELAY, B+	I57
SII	TXL	0.5	VT/WH	FUEL PUMP/LEVEL	I	SPEEDOMETER	II	FUEL SENSOR	I58
XBA	TXL	0.5	BN/WH	BRAKE SWITCH	2	BRAKE DIODE	2	BRAKE SIGNAL	I59
XBB	TXL	0.5	BN/WH	BRAKE DIODE	2	START SOLENOID	2	START RELAY ENABLE	I60
XBC	TXL	0.5	BN/WH	BRAKE DIODE	I	LH TAILLIGHT	3	BRAKE SIGNAL	I6I
XBD	TXL	0.5	BN/WH	BRAKE DIODE	I	RH TAILLIGHT	3	BRAKE SIGNAL	I62
XH	TXL	0.5	YE	LEFT HAND CONTROL	P	LOAD CENTER	4I	HIGH BEAM SIGNAL	I63
XL	TXL	0.5	DG	LEFT HAND CONTROL	G	LOAD CENTER	25	LOW BEAM SIGNAL	I64
XN	TXL	0.8	GY/RD	LEFT HAND CONTROL	K	HORN SIGNAL	I	HORN SUPPLY	I65

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WIRE PREFIX LEGEND	
WIRE PREFIX	FUNCTION
B	BATTERY VOLTAGE WHEN BATTERY IS CONNECTED
K	BATTERY VOLTAGE WHEN KEY AND RUN/STOP SWITCHES ARE ON
G	GROUND
F	FUSE OUTPUT
FA	ACCESSORIES
FC	CHASSIS
FD	DRIVE
FE	ECM
FJ	FUEL INJECTION
FL	LIGHTS (LOW BEAM IF SEPARATE)
FM	LIGHTS, HIGH BEAM
FP	FUEL PUMP
FS	STARTER
FT	POWER STEERING
FU	UNSWITCHED
FZ	HAZARD
R	RELAY OUTPUT
RA	ACCESSORIES
RB	BATTERY
RC	CHASSIS
RE	ECM
RF	FAN
RJ	FUEL INJECTION
RL	LIGHTS, LOW BEAM
RM	LIGHTS, HIGH BEAM
RP	FUEL PUMP
RS	STARTER
RT	POWER STEERING
X	SWITCH OUTPUT
XB	BRAKE
XC	ADC or ADC/AWD 2
XD	AWD or ADC/AWD 1
XH	HIGH BEAM
XL	LOW BEAM
XT	TURF
XWH	HANDWARMER HIGH
XWL	HANDWARMER LOW
XWT	THUMBWARMER
XN	HORN
XS	START COMMAND
XTL	TURN SIGNAL LEFT
XTR	TURN SIGNAL RIGHT
XR	REVERSE COMMAND
XV	REVERSE OVERRIDE COMMAND
XZ	HAZARD
E	ECM PIN NUMBER
S	SPEEDOMETER PIN NUMBER
CB	CIRCUIT BREAKER OUTPUT
H	HAZARD/TURN FLASHER PIN NUMBER
A	ABS ECU
BUS NUMBER	INTERNAL BUSS IN THE LOAD CENTER
	MISCELLANEOUS

HARNESS-MAIN,570 EFI,UTE,INTL

WIRE COLOR LEGEND	
BA	BEIGE (TAN)
BL	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BR	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OR	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
TR	TRANSP.

TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.

▽ = ENGINE GROUND

▽ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

DIAGNOSTIC

WINCH SWITCH

LH TURN SIGNAL (P/N 2411147)

LH HEADLIGHT (P/N 2410615) (HEADLIGHT BULB SERVICE P/N 4010253)

POD LIGHT P/N 2410614

SPEEDOMETER

RH HEADLIGHT (P/N 2410616) (HEADLIGHT BULB SERVICE P/N 4010253)

RH TURN SIGNAL (P/N 2411148)

HORN (P/N 4011578)

EPS POWER (A)	
PIN	FUNCTION
A	BATTERY (+)
B	BATTERY (+)

EPS SENSOR (B)	
PIN	FUNCTION
1	ENGINE RPM (NEG. REF.)
2	ENGINE RPM
3	IGNITION SIGNAL
4	CAN BUS LOW
5	VEHICLE SPEED
6	VEHICLE SPEED (NEG. REF.)
7	EPAS SYSTEM FAULT SIGNAL
8	CAN BUS HIGH

POWER STEERING ASSEMBLY (P/N 2411530)

RIGHT HANDLEBAR SWITCH ASSEMBLY

KEY SWITCH (P/N 4012168)

	RUN	ACC
OFF		
ON LIGHTS	●	●
RUN	●	●
START	●	

POD ACC GROUND

12V RECEPTACLE (P/N 4010638)

POD ACC B+

LEFT HANDLEBAR SWITCH ASSY (P/N 4012435)

	A	B	C	D	E	F	G	H	J	K	L	M	N	P
LOW BEAM														
HIGH BEAM														
FLASH PASS														
L TURN														
R TURN														
KEY OVERRIDE														
HAZARD														
HORN														
RUN														

A:YE/DG B:BU/RD C:RD/GN D:RD/BK E:RD/OG F:RD/YE G:DG

H:BN J:DB/RD K:GY/RD L:OG M:BN N:WH P:YE

SPLICE, GROUND POD

SPLICE, GROUND FRONT

SPLICE, HIGH BEAM

SPLICE, LOW BEAM

SPLICE, LIGHTS B+

SPLICE, CAN LOW

SPLICE, CAN HIGH

SPLICE, ACCESSORY

SPLICE, B+ UNSWITCHED

SPLICE, B+ SWITCHED

SPLICE, R/S B+

SPLICE, UNSWITCHED FUSE B+

CHASSIS DIODE (P/N 2410000)

SPLICE, DRIVE

FUEL PUMP

TANK LEVEL	RESISTANCE (Ω)
FULL	9.0±1.5Ω
EMPTY	90.0±4.5Ω

PIN	FUNCTION
1	FUEL LEVEL SENSOR "+"
2	FUEL LEVEL SENSOR "-"
3	FUEL PUMP "+"
4	FUEL PUMP "-"

FUEL PUMP/LEVEL

FAN MOTOR

AMD/ADC HUB COIL

AMD COIL (2Ω)

ADC COIL (2Ω)

IGNITION COIL (P/N 4011834)

PRIMARY 0.62Ω±15%
SECONDARY 1.64Ω±15%

TRIM FLUSH

1. HAZARD
2. IGNITION SWITCH
3. DIR-RIGHT
4. DIR-LEFT
5. LOAD TYPE
6. LOAD TYPE
7. REAR RIGHT
8. FRONT RIGHT
9. RIGHT TURN
10. LEFT TURN
11. FRONT LEFT
12. REAR LEFT

LED FLASHER MODULE (P/N 4013043)

THERMISTOR (P/N 4010644)

NOMINAL RESISTANCE:
AT 20°C±2.5 KΩ±8%
AT 100°C±2.186 KΩ±2%

T-MAP (P/N 2411528)

1. GROUND
2. NTC
3. +5V
4. OUTPUT SIGNAL

PRESSURE SENSOR

TPS (P/N 4012436)

IDLE AIR CONTROL	
RESISTANCE BETWEEN PINS	
PINS	RESISTANCE
1-2	36Ω±8(±1.2Ω)
2-3	36Ω±8(±1.2Ω)
1-3	68Ω±2.4Ω
4-5	36Ω±8(±1.2Ω)
5-6	36Ω±8(±1.2Ω)
4-6	68Ω±2.4Ω
ALL OTHER COMBINATIONS:OPEN	

TEMP	RESISTANCE
0°F 25°C	2252-2460Ω

CRANK POSITION SENSOR

SPLICE, CPS SHIELD

CIRCUIT BREAKER 10 AMP

P/N 2410692

SPLICE, FUSIBLE #1

SPLICE, FUSIBLE #2

BRAKE DIODE (P/N 2411035) 8A DIODE

SPLICE, GROUND REAR

SPLICE, ECM SIGNAL GROUND

SPEED SENSOR (LOCATED ON TRANSMISSION)

HALL SENSOR

POWER IN PIN "A"

V OUT PIN "C"

COMMON PIN "B"

TRANSMISSION SWITCH P/N 7661999

HIGH	620Ω
LOW	350Ω
NEU	160Ω
REV	730Ω
PARK	240Ω

SPLICE, SHIELD

SPLICE, EFI RELAY

INJECTOR DRIVER

RESISTANCE: 12Ω±0.5Ω

FUEL INJECTOR

STATOR (P/N 4013970) (FLYWHEEL P/N 4013969)

REGULATOR (4014405)

START SOLENOID

STARTER MOTOR

BATTERY VOLTAGE: 12V

B+ TERMINAL BLOCK (P/N 4011892)

GROUND A

GROUND B

BRAKE SWITCH (ON JUNCTION BLOCK)

LH TAILLIGHT (P/N 2410787)

RH TAILLIGHT (P/N 2410788)

REAR ACCESSORY

HARNESS-MAIN,570 EFI,UTE,INTL

WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
CL	CLEAR

TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE:RD/YE = RED WITH YELLOW TRACE.

⏚ = ENGINE GROUND

⏚ = CHASSIS GROUND

NC = SWITCH NORMALLY CLOSED

NO = SWITCH NORMALLY OPEN

SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
4014424-B20	SGT	13.0	RD	SOLENOID B+	I	SOLENOID B+	I	TBD	1
4014535-SOL	SGT	13.0	RD	B+	I	B+	I	TBD	2
4014535-TB	SGT	13.0	RD	B+	I	B+	I	TBD	3
4014547-START	SGT	13.0	BK	GND	I	GND	I	TBD	4
4014547-TB	SGT	13.0	BK	GND	I	GND	I	TBD	5
BAA	FUSIBLE LINK	1.0	BK	BATTERY PLUS #1	I	SPLICE, FUSIBLE #1	I	UNSWITCHED, B+	6
BAB	TEL	3.0	RD	SPLICE, FUSIBLE #1	2	LOAD CENTER	35	UNSWITCHED, B+	7
BBA	FUSIBLE LINK	0.8	BU	BATTERY PLUS #1	I	SPLICE, FUSIBLE #2	2	UNSWITCHED,B+	8
BBB	TEL	2.0	RD	SPLICE, FUSIBLE #2	I	SPLICE, B+ UNSWITCHED	I	UNSWITCHED, B+	9
BBC	TEL	0.8	RD	SPLICE, B+ UNSWITCHED	I	LOAD CENTER	36	UNSWITCHED, B+	10
BBD	TEL	2.0	RD	LOAD CENTER	28	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	11
BBE	TEL	0.5	RD	LOAD CENTER	20	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	12
BBF	TEL	2.0	RD	LOAD CENTER	4	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	13
BBG	TEL	0.5	RD	LOAD CENTER	12	SPLICE, B+ UNSWITCHED	2	UNSWITCHED, B+	14
BCA	TEL	1.0	RD	BATTERY PLUS #1	I	FAN CKT BKR	I	UNSWITCHED, B+	15
CBA	TEL	1.0	RD/WH	LOAD CENTER	10	FAN CKT BKR	2	UNSWITCHED FUSED, B+	16
C_A227	TEL	0.5	BK	CRANK POSITION SENSOR	2	ECM	223	CRANK -	17
C_A239	TEL	0.5	WH	CRANK POSITION SENSOR	I	ECM	239	CRANK +	18
C_AC	SHLD	0.5	SHLD	SPLICE, SHIELD	I	SPLICE, CPS SHIELD	2	CRANK POSITION SENSOR SHIELD	19
C_B255	TEL	0.5	BK	IGNITION COIL	P1	ECM	255	MAG IGNITION CONTROL	20
C_BB	TEL	0.5	WH	IGNITION COIL	P2	SPLICE, EFI RELAY	2	PTO IGNITION CONTROL	21
C_BC	SHLD	0.35	SHLD	TRIM FLUSH	-	SPLICE, SHIELD	2	PRIMARY CABLE SHIELD	22
E202	TEL	0.5	DG/YE	ECM	202	LOAD CENTER	6	EFI RELAY COIL GROUND	23
E204	TEL	0.5	DG/YE	ECM	204	LOAD CENTER	14	FAN RELAY COIL GROUND	24
E205	TFE	0.5	BU	ECM	205	INJECTOR DRIVER	I	MAG INJECTOR CONTROL	25
E206	TFE	0.5	OG	TPS	5	ECM	206	5V TO TPS	26
E207	TFE	0.5	OG	ECM	207	TMAP	3	5V B+ MAP	27
E210	TFE	0.5	DG	TPS	2	ECM	210	TPS SIGNAL	28
E211	TEL	0.5	GY/OG	ECM	211	LEFT HAND CONTROL	F	REVERSE OVERRIDE	29
E217	TEL	0.5	BN/WH	AWD	B	ECM	217	AWD CONTROL	30
E219	TEL	0.5	DG/YE	ECM	219	LOAD CENTER	22	FUEL PUMP, COIL -	31
E222	TFE	0.5	YE	TMAP	4	ECM	222	PRESSURE SENSOR	32
E223	TEL	0.5	WH	ECM	223	TRANSMISSION SWITCH	B	TRANSMISSION SIGNAL OUTPUT	33
E224	TFE	0.5	BU	TMAP	2	ECM	224	AIR TEMP SENSOR	34
E225	TFE	0.5	RD	IAC	3	ECM	225	IAC DRIVE B	35
E226	TFE	0.5	BK	IAC	4	ECM	226	IAC DRIVE A	36
E228	TEL	0.5	GY	RIGHT HAND CONTROL	4	ECM	228	AWD/ADC REQUEST LOGIC I	37
E230A	TEL	0.5	VT	SPLICE, ECM SIGNAL GROUND	I	ECM	230	ECM SIGNAL GROUND	38
E230B	TEL	0.5	VT	COOLANT TEMP SENSOR	I	SPLICE, ECM SIGNAL GROUND	I	ECM SIGNAL GROUND	39
E230C	TEL	0.5	VT	RIGHT HAND CONTROL	2	SPLICE, ECM SIGNAL GROUND	I	ECM SIGNAL GROUND	40
E230D	TEL	0.5	VT	TRANSMISSION SWITCH	A	SPLICE, ECM SIGNAL GROUND	2	ECM SIGNAL GROUND	41
E231	TFE	0.5	VT	TPS	1	ECM	231	TPS GROUND	42
E232	TEL	0.5	PK/WH	RIGHT HAND CONTROL	I	ECM	232	THROTTLE SAFETY SWITCH	43
E236A	TEL	0.5TP	YE	SPLICE, CAN HIGH	I	CAN	236	CAN HIGH	44
E236B	TEL	0.5TP	YE	SPLICE, CAN HIGH	I	DIAGNOSTIC	H	CAN HIGH	45
E236C	TEL	0.5TP	YE	SPEEDOMETER	I	SPLICE, CAN HIGH	I	CAN HIGH	46
E236D	TEL	0.5TP	YE	SPLICE, CAN HIGH	2	EPS SIGNAL	8	CAN HIGH, EPS	47
E237	TFE	0.5	DG	IAC	I	ECM	237	IAC DRIVE C	48
E238	TFE	0.5	BU	IAC	6	ECM	238	IAC DRIVE D	49
E242	TFE	0.5	VT	TMAP	I	ECM	242	SENSOR RETURN, T-MAP	50
E244	TEL	0.5	YE	ECM	244	COOLANT TEMP SIGNAL	2	COOLANT TEMP SIGNAL	51
E245	TEL	0.5	GN/RD	SPEED SENSOR	C	ECM	245	GROUND SPEED SIGNAL	52
E246	TEL	0.5	BK/RD	ECM	246	RIGHT HAND CONTROL	5	AWD/ADC REQUEST LOGIC 2	53
E248A	TEL	0.5TP	DG	SPLICE, CAN LOW	2	ECM	248	CAN LOW	54
E248B	TEL	0.5TP	DG	SPLICE, CAN LOW	I	DIAGNOSTIC	G	CAN LOW	55
E248C	TEL	0.5TP	DG	SPLICE, CAN LOW	I	SPEEDOMETER	2	CAN LOW	56
E248D	TEL	0.5TP	DG	SPLICE, CAN LOW	2	EPS SIGNAL	4	CAN LOW, EPS	57
E249	TEL	0.5	BN/YE	AWD	A	ECM	249	ADC CONTROL	58
FAA	TEL	1.0	OG/WH	SPLICE, ACCESSORY	I	LOAD CENTER	31	ACC FUSE POWER OUT	59
FAB	TEL	1.0	OG/WH	SPLICE, ACCESSORY	I	BULKHEAD ACCESSORY 1 B+	I	FUSE ACCESSORIES, B+	60
FAC	TEL	1.0	OG/WH	SPLICE, ACCESSORY	2	BULKHEAD ACCESSORY 2 B+	I	FUSE ACCESSORIES, B+	61
FAD	TEL	0.8	OG/WH	SPLICE, ACCESSORY	2	POD ACC B+	I	FUSE ACCESSORIES, B+	62
FAE	TEL	0.8	OG/WH	SPLICE, ACCESSORY	2	REAR ACCESSORY	P1	FUSE ACCESSORIES, B+	63
FDA	TEL	0.8	RD/GN	SPLICE, DRIVE	I	LOAD CENTER	23	DRIVE FUSE POWER OUT	64
FDB	TEL	0.8	RD/GN	WINCH SWITCH	I	SPLICE, DRIVE	2	WINCH SWITCH POWER	65
FDC	TEL	0.5	RD/GN	AWD	C	SPLICE, DRIVE	I	SWITCHED, B+	66
FDD	TEL	0.5	RD/GN	AWD	D	SPLICE, DRIVE	I	SWITCHED, B+	67
FDE	TEL	0.5	RD/GN	LEFT HAND CONTROL	C	SPLICE, DRIVE	2	B+ SWITCHED, HORN SUPPLY	68
FJ	TEL	1.0	RD/GN	LOAD CENTER	24	LOAD CENTER	2	EFI FUSE EFI RELAY, B+	69
FLA	TEL	2.0	RD/BN	SPLICE, LIGHTS B+	2	LOAD CENTER	15	LIGHTS FUSE POWER OUT	70
FLB	TEL	0.8	RD/BN	SPLICE, LIGHTS B+	2	KEY SWITCH	A	LIGHTS B+	71
FLC	TEL	1.0	RD/BN	LOAD CENTER	26	SPLICE, LIGHTS B+	2	LIGHTS B+, LOW BEAM	72
FLD	TEL	0.5	RD/BN	SPLICE, LIGHTS B+	2	RH TAILLIGHT	A	LIGHTS B+, TAIL LIGHT	73
FLE	TEL	0.8	RD/BN	SPLICE, LIGHTS B+	2	LH TAILLIGHT	A	LIGHTS B+, TAIL LIGHT	74
FLF	TEL	0.5	RD/BN	SPLICE, LIGHTS B+	I	HAZARD FLASHER	2	KEY SWITCH B+, LIGHTS/START B+	75
FPA	TEL	0.5	RD/GN	LOAD CENTER	16	SPLICE, FP	I	EFI RELAY, FUSED B+	76
FPB	TEL	0.5	RD/GN	LOAD CENTER	17	SPLICE, FP	I	EFI RELAY, FUSED B+	77
FPC	TEL	0.5	RD/GN	LOAD CENTER	18	SPLICE, FP	I	EFI RELAY, FUSED B+	78
FPD	TEL	0.5	RD/GN	SPLICE, FP	2	LOAD CENTER	I	KEY SWITCH B+,EFI COIL +	79
FT	TEL	3.0	RD	LOAD CENTER	34	LOAD CENTER	39	UNSWITCHED, B+	80
FUA	TEL	0.8	RD/BK	CHASSIS DIODE	P2	LOAD CENTER	32	REVERSE POLARITY DIODE ANODE	81
FUB	TEL	0.5	RD/BK	DIAGNOSTIC	A	CHASSIS DIODE	P2	UNSWITCHED FUSED, B+	82
FUD	TEL	0.5	RD/WH	CHASSIS DIODE	P1	SPLICE, UNSWITCHED FUSE B+	I	REVERSE POLARITY DIODE CATHODE	83
FUE	TEL	0.5	RD/WH	SPEEDOMETER	4	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	84
FUF	TEL	0.5	RD/WH	KEY SWITCH	C	SPLICE, UNSWITCHED FUSE B+	2	UNSWITCHED FUSED, B+	85
FUG	TEL	0.5	RD/WH	SPLICE, UNSWITCHED FUSE B+	2	LOAD CENTER	9	FAN RELAY COIL +	86
FZ	TEL	0.8	RD	LEFT HAND CONTROL	F	LOAD CENTER	40	FUSED B+, HAZARD FUSE	87
GAA	TEL	0.8	BN	FUEL PUMP/LEVEL	A	GROUND A	I	GROUND	88
GABA	TEL	3.0	BN	SPLICE, GROUND FRONT	2	GROUND A	I	GROUND	89
GABB	TEL	1.0	BN	SPLICE, GROUND POD	2	SPLICE, GROUND FRONT	2	GROUND	90
GABC	TEL	0.8	BN	RIGHT HEADLIGHT	A	SPLICE, GROUND FRONT	2	GROUND	91
GABD	TEL	0.5	BN	SPLICE, GROUND FRONT	2	FUEL PUMP/LEVEL	2	GROUND	92
GABE	TEL	0.5	BN	LOAD CENTER	30	SPLICE, GROUND FRONT	2	GROUND, LOW BEAM COIL -	93
GABF	TEL	0.5	BN	LOAD CENTER	38	SPLICE, GROUND FRONT	2	GROUND	94
GABG	TEL	0.5	BN	DIAGNOSTIC	D	SPLICE, GROUND FRONT	I	DIAGNOSTIC, GROUND	95
GABH	TEL	0.8	BN	LEFT HEADLIGHT	A	SPLICE, GROUND FRONT	I	GROUND	96

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SCHEMATIC CABLE/WIRE TERMINATION TABLE

CCT #	TYPE	GAUGE	COLOR	FROM COMPONENT	FROM PORT	TO COMPONENT	TO PORT	FUNCTION	INDEX
GABJ	TXL	0.5	BN	LEFT HAND CONTROL	M	SPLICE, GROUND POD	I	GROUND	97
GABK	TXL	1.0	BN	POD ACC GROUND	I	SPLICE, GROUND POD	2	GROUND	98
GABL	TXL	0.8	BN	POD LIGHT	A	SPLICE, GROUND POD	2	GROUND,POD LIGHT (OPTIONAL)	99
GABM	TXL	0.5	BN	SPLICE, GROUND POD	2	SPEEDOMETER	5	GROUND	100
GABN	TXL	0.5	BN	BRAKE SWITCH	P1	SPLICE, GROUND POD	2	GROUND	101
GABP	TXL	0.5	BN	SPLICE, GROUND POD	2	RIGHT HAND CONTROL	3	GROUND	102
GABQ	TXL	0.35	BN	LEFT FRONT TURN LAMP	2	SPLICE, GROUND FRONT	I	GROUND	103
GABR	TXL	0.35	BN	RIGHT FRONT TURN LAMP	2	SPLICE, GROUND FRONT	2	GROUND	104
GABS	TXL	0.5	BN	SPLICE, GROUND FRONT	2	HORN GROUND	I	GROUND	105
GABT	TXL	0.5	BN	LEFT HAND CONTROL	H	SPLICE, GROUND POD	I	GROUND	106
GABU	TXL	0.5	BN	HAZARD FLASHER	6	SPLICE, GROUND FRONT	I	GROUND	107
GABV	TXL	0.5	BN	HAZARD FLASHER	5	SPLICE, GROUND FRONT	I	GROUND	108
GAC	TXL	0.5	BN	GROUND A	I	LOAD CENTER	8	CHASSIS RELAY COIL GROUND	109
GAD	TXL	1.0	BN	FAN	A	GROUND A	I	GROUND	110
GBA	TXL	0.5	BN	ECM	250	GROUND B	I	GROUND	111
GBB	TXL	0.5	BN	GROUND B	I	ECM	251	GROUND	112
GBC	TXL	0.5	BN	GROUND B	I	ECM	252	GROUND	113
GBD	TXL	0.5	BN	SPEED SENSOR	B	GROUND B	I	GROUND	114
GBF	TXL	3.0	BN	EPS POWER	B	GROUND B	I	GROUND	115
GBGA	TXL	0.5	BN	SPLICE, SHIELD	I	GROUND B	I	GROUND	116
GBGB	TXL	0.5	BN	CRANK POSITION SENSOR	3	SPLICE, CPS SHIELD	I	CRANK POSITION SENSOR SHIELD	117
GBHA	TXL	1.0	BN	GROUND B	I	SPLICE, GROUND REAR	I	GROUND	118
GBHB	TXL	0.8	BN	REAR ACCESSORY	P2	SPLICE, GROUND REAR	2	GROUND	119
GBHC	TXL	0.8	BN	RIGHT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND	120
GBHD	TXL	0.8	BN	RH TAILLIGHT	B	SPLICE, GROUND REAR	2	GROUND	121
GBHE	TXL	0.8	BN	LH TAILLIGHT	B	SPLICE, GROUND REAR	2	GROUND	122
GBHF	TXL	0.8	BN	LEFT REAR TURN LAMP	2	SPLICE, GROUND REAR	2	GROUND	123
HO1	TXL	0.5	BU	LEFT HAND CONTROL	N	HAZARD FLASHER	I	HAZARD INPUT	124
HO3	TXL	0.5	DB/WH	HAZARD FLASHER	3	SPEEDOMETER	6	RIGHT TURN INDICATOR	125
HO4	TXL	0.5	BU/WH	HAZARD FLASHER	4	SPEEDOMETER	7	LEFT TURN INDICATOR	126
HO7	TXL	0.5	DB/YE	HAZARD FLASHER	7	RIGHT REAR TURN LAMP	I	RIGHT REAR TURN SIGNAL	127
HO8	TXL	0.35	DB/OG	RIGHT FRONT TURN LAMP	I	HAZARD FLASHER	8	RIGHT FRONT TURN SIGNAL	128
HO9	TXL	0.5	DB/RD	LEFT HAND CONTROL	J	HAZARD FLASHER	9	RIGHT TURN SIGNAL COMMAND	129
HIO	TXL	0.5	BU/RD	LEFT HAND CONTROL	B	HAZARD FLASHER	10	LEFT TURN SIGNAL COMMAND	130
HI1	TXL	0.35	BU/OG	LEFT FRONT TURN LAMP	I	HAZARD FLASHER	11	LEFT FRONT TURN SIGNAL	131
HI2	TXL	0.5	BU/YE	HAZARD FLASHER	12	LEFT REAR TURN LAMP	I	LEFT REAR TURN SIGNAL	132
KB	TXL	0.5	BU/YE	KEY SWITCH	B	START SOLENOID	S	START SIGNAL	133
KDA	TXL	0.5	RD/BK	KEY SWITCH	D	LEFT HAND CONTROL	D	KEY SWITCH B+, RUN/STOP SUPPLY	134
KDB	TXL	0.5	OG	LEFT HAND CONTROL	L	SPLICE, R/S B+	I	RUN/STOP SIGNAL, R/S SPLICE B+	135
KDC	TXL	0.5	OG	SPLICE, R/S B+	I	DIAGNOSTIC	B	KEY SWITCH B+,DIAGNOSTIC	136
KDD	TXL	0.5	OG	SPEEDOMETER	3	SPLICE, R/S B+	I	KEY SWITCH B+,SPEEDOMETER	137
KDE	TXL	0.5	OG	SPLICE, R/S B+	2	EPS SIGNAL	3	KEY SWITCH B+	138
KDF	TXL	0.5	OG	SPLICE, R/S B+	2	LOAD CENTER	33	KEY SWITCH B+,EPS COIL +	139
KDG	TXL	0.5	OG	LOAD CENTER	3	SPLICE, R/S B+	2	CHASSIS RELAY COIL POWER	140
KDH	TXL	0.5	OG	SPEED SENSOR	A	SPLICE, R/S B+	2	KEY SWITCH B+,SPEED SENSOR	141
KDJ	TXL	0.5	OG	SPLICE, R/S B+	2	ECM	209	KEY SWITCH B+,ECM B+	142
KE	TXL	0.8	RD/BN	KEY SWITCH	C	LEFT HAND CONTROL	A	KEY SWITCH B+, LIGHTS ENABLE	143
RCA	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	7	SWITCHED, B+	144
RCB	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	11	SWITCHED, B+	145
RCC	TXL	1.0	WH	SPLICE, B+ SWITCHED	2	LOAD CENTER	19	SWITCHED, B+	146
RCD	TXL	1.0	WH	SPLICE, B+ SWITCHED	I	LOAD CENTER	23	SWITCHED, B+	147
RF	TXL	1.0	OG/BK	FAN	B	LOAD CENTER	13	FAN RELAY POWER OUT	148
RJA	TXL	1.0	RD/BU	SPLICE, EFI RELAY	I	LOAD CENTER	5	EFI RELAY POWER OUT	149
RJB	TXL	1.0	RD/BU	ECM	253	SPLICE, EFI RELAY	I	EFI RELAY, B+	150
RJC	TFE	0.8	RD	INJECTOR DRIVER	2	SPLICE, EFI RELAY	2	EFI RELAY, B+	151
RLA	TXL	1.0	DG	LOAD CENTER	29	SPLICE, LOW BEAM	I	LOW BEAM B+	152
RLB	TXL	0.8	DG	LEFT HEADLIGHT	B	SPLICE, LOW BEAM	I	LOW BEAM B+	153
RLC	TXL	0.8	DG	SPLICE, LOW BEAM	2	RIGHT HEADLIGHT	B	LOW BEAM B+	154
RP	TXL	0.8	RD/BU	FUEL PUMP/LEVEL	3	LOAD CENTER	21	EFI RELAY, B+	155
RT	TXL	3.0	OG	EPS POWER	A	LOAD CENTER	37	EPS RELAY SWITCHED POWER	156
S11	TXL	0.5	VT/WH	FUEL PUMP/LEVEL	I	SPEEDOMETER	11	FUEL SENSOR	157
XBA	TXL	0.5	BN/WH	BRAKE SWITCH	P2	BRAKE DIODE	2	BRAKE SIGNAL	158
XBB	TXL	0.5	BN/WH	BRAKE DIODE	2	START SOLENOID	2	START RELAY ENABLE	159
XBC	TXL	0.5	BN/WH	BRAKE DIODE	I	LH TAILLIGHT	C	BRAKE SIGNAL	160
XBD	TXL	0.5	BN/WH	BRAKE DIODE	I	RH TAILLIGHT	C	BRAKE SIGNAL	161
XHA	TXL	0.5	YE	LEFT HAND CONTROL	P	SPLICE, HIGH BEAM	I	HIGH BEAM SIGNAL	162
XHB	TXL	0.5	YE	SPLICE, HIGH BEAM	2	POD LIGHT	B	HIGH BEAM B+, POD LIGHT (OPTIONAL)	163
XHC	TXL	0.5	YE	SPLICE, HIGH BEAM	2	SPEEDOMETER	8	HIGH BEAM SIGNAL	164
XL	TXL	0.5	DG	LEFT HAND CONTROL	G	LOAD CENTER	25	LOW BEAM SIGNAL	165
XN	TXL	0.8	GY/RD	LEFT HAND CONTROL	K	HORN SIGNAL	I	HORN SIGNAL	166

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WIRE PREFIX LEGEND	
WIRE PREFIX	FUNCTION
B	BATTERY VOLTAGE WHEN BATTERY IS CONNECTED
K	BATTERY VOLTAGE WHEN KEY AND RUN/STOP SWITCHES ARE ON
G	GROUND
F	FUSE OUTPUT
FA	ACCESSORIES
FC	CHASSIS
FD	DRIVE
FE	ECM
FJ	FUEL INJECTION
FL	LIGHTS (LOW BEAM IF SEPARATE)
FM	LIGHTS, HIGH BEAM
FP	FUEL PUMP
FS	STARTER
FT	POWER STEERING
FU	UNSWITCHED
FZ	HAZARD
R	RELAY OUTPUT
RA	ACCESSORIES
RB	BATTERY
RC	CHASSIS
RE	ECM
RF	FAN
RJ	FUEL INJECTION
RL	LIGHTS, LOW BEAM
RM	LIGHTS, HIGH BEAM
RP	FUEL PUMP
RS	STARTER
RT	POWER STEERING
X	SWITCH OUTPUT
XB	BRAKE
XC	ADC or ADC/AWD 2
XD	AWD or ADC/AWD 1
XH	HIGH BEAM
XL	LOW BEAM
XT	TURF
XWH	HANDWARMER HIGH
XWL	HANDWARMER LOW
XWT	THUMBWARMER
XN	HORN
XS	START COMMAND
XTL	TURN SIGNAL LEFT
XTR	TURN SIGNAL RIGHT
XR	REVERSE COMMAND
XV	REVERSE OVERRIDE COMMAND
XZ	HAZARD
C	ECM PIN NUMBER
S	SPEEDOMETER PIN NUMBER
CB	CIRCUIT BREAKER OUTPUT
H	HAZARD/TURN FLASHER PIN NUMBER
A	ABS ECU
BUS	INTERNAL BUSS IN THE LOAD CENTER
NUMBER	MISCELLANEOUS