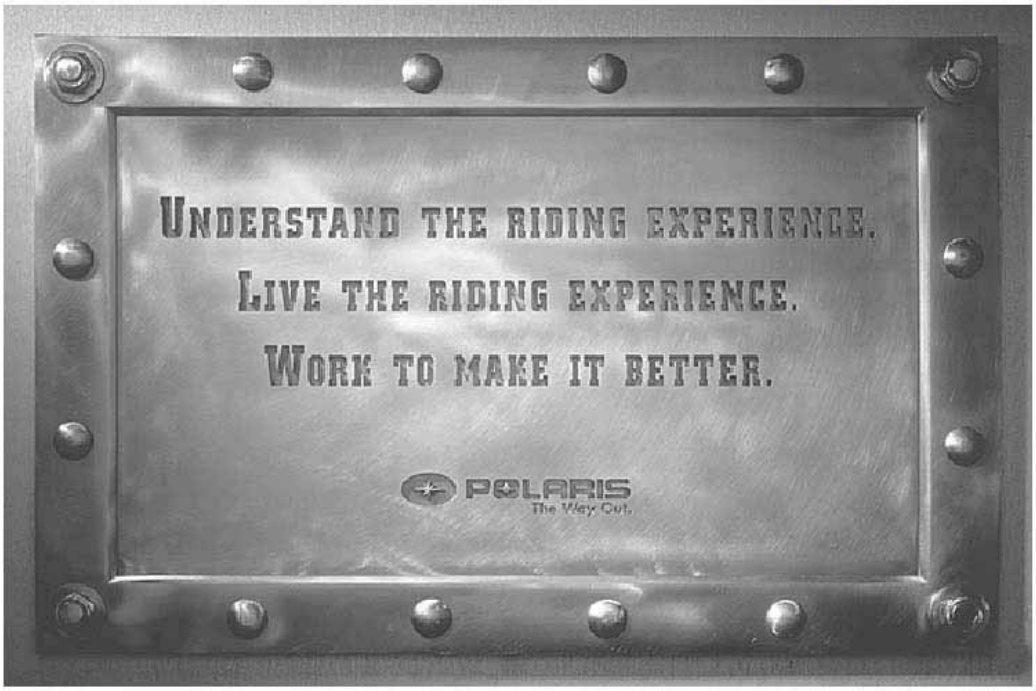
POLARIS
The Way Out.



2007 TWO STROKE SNOWMOBILE SERVICE MANUAL

FOREWORD

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 service procedures before starting the work. Certain procedures require the use of special tools. Use only the proper tools as specified.

Comments or suggestions about this manual may mailed to: Service Publications Dept. @ Polaris Sales Inc. 2100 Hwy 55 Medina Minnesota 55340.

You may also fill out a Comments and suggestion electronic form that can be located at **www.polarisdealers.com** in the **News, Forms & Links** area click on **Service & Warranty** link and the feedback link is at the bottom of the page named **Polaris Manual Correction Feedback** link.

2007 Two Stroke Snowmobile Service Manual PN 9920463

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UNDERSTANDING MANUAL 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.

 = In. / mm.

MEASUREMENT provides a key for a determined measurement specification.

 = T

TORQUE provides a key for a required torque value.

TRADEMARKS

POLARIS ACKNOWLEDGES THE FOLLOWING PRODUCTS MENTIONED IN THIS MANUAL:

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CHAPTER 1
MODEL SPECIFICATIONS

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340 LX

MODEL S07ND3AS

Body

Body Style	EDGE

Engine

Engine type	Fuji
Engine displacement	339cc
Bore (in/mm)	2.45/62.3
Stroke (in/mm)	2.19/55.6
Piston to cylinder clearance (in/mm)	.003-.005/.080-.130
Piston ring end gap (in/mm)	.008-.014/.20-.41
Operating RPM±200	7000
Idle RPM±200	1600
Clutch engagement RPM ±200	4100

Fuel Delivery

Type	VM30SS
Main Jet	170
Pilot Jet	35
Jet Needle/Clip position	5DP13/3
Needle Jet	O-6 (169)
Throttle gap under cutaway (in/mm)	.240/6.1
Throttle slide cutaway	2.5AL
Valve seat	1.5Viton
Starter jet	1.5
Pilot air jet	2.5
Fuel screw setting	N/A
Air screw setting	1.5
Recommended fuel octane (R+M/2)	87 NonOxy Minimum

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	185 #4	180 #3	170 #3	170 #3	165 #3	160 #3	155 #3	150 #3
600-1200 (2000-4000)	175 #3	170 #3	160 #3	160 #3	155 #3	150 #3	140 #2	140 #2
1200-1800 (4000-6000)	165 #3	160 #3	155 #3	150 #3	145# 3	140 #2	130 #2	130 #2
1800-2400 (6000-8000)	155 #3	150 #3	140 #3	135 #3	135 #2	130 #2	120 #1	120 #1
2400-3000 (8000-10000)	145 #3	140 #3	130 #2	130 #2	125 #2	120 #1	110 #1	110 #1
3000-3700 (10000-12000)	135 #3	130 #2	120 #2	115 #2	115 #1	110 #1	100 #1	100 #1

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-900 (0-3000)	10	110/290 (Black-2287)	Red/ Black	S36 LW ER	16:41-72
900-1800 (3000-6000)	10-M Blue	110/290 (Black-2287)	Red/ Black	S36 LW ER	16:41-72
1800-2700 (6000-9000)	10MW	110/290 (Black-2287)	Red/ Black	S36 LW ER	16:41-72
2700-3700 (9000-12000)	10MR	110/290 (Black-2287)	Red/ Black	S36 LW ER	16:41-72
Drive clutch bolt torque 50 ft-lbs (69 N-m)					

Belt

Belt part number	3211078
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/20.1
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.8/44.7
Oil (qts/l)	3.25/3.1
Coolant (qts/l)	N/A
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	121/307
Lug height (in/cm)	.66/1.7
Manufacture	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.5/1-1.3

Front Suspension

Suspension type	Edge LX
IFS shocks	Arvin/7041932
IFS Spring PN	7041551
IFS Spring Pre-Load (in/mm)	.625/15.9
IFS spring rate (lb/in - kg/mm)	100/1.79
IFS Spring free length (in/cm)	10.75/27.3
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	.59±.31/15.0±7.9
Toe (in/mm)	.12-.25/3.0-6.35

Rear Suspension

Suspension type	Edge 121
Front track shock (FTS)	Arvin/7041939
FTS Spring PN	7041253
FTS Spring Free Length (in/cm)	7.5/19
FTS Spring Rate (lb/in - kg/mm)	200-240/3.6-4.3
FTS pre-load	Fixed
Rear track shock	Arvin MPV/7043239
Rear travel (in/cm)	13.9/35.3

Torsion Spring

Torsion spring PNs (LH/RH)	7041629/7041630
Torsion spring diameter (in/mm)	.359/9.12
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	48/122
Length (in/cm)	113/287
Height (in/cm)	46/117
Est dry weight (lb/kg)	457/207.7

Electrical

Ignition timing	26.5°@3000RPM
Spark plug gap (in/mm)	.0275/.70
Spark plug	NGK BR8ES
Voltage regulator/output	240watt
CDI marking	CU7245
Flywheel Markings	FP9313

Features

Electric Fuel Gauge	Accessory
Electric Start	Standard
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard 5 inch
Tachometer	Accessory

340 TOURING

MODEL S07NT3A(E,S)

Body

Body Style	EDGE

Engine

Engine type	Fuji
Engine displacement	339cc
Bore (in/mm)	2.45/62.3
Stroke (in/mm)	2.19/55.6
Piston to cylinder clearance (in/mm)	.003-.005/.080-.130
Piston ring end gap (in/mm)	.008-.014/.20-.41
Operating RPM±200	7000
Idle RPM±200	1600
Clutch engagement RPM ±200	3700

Fuel Delivery

Type	VM30SS
Main Jet	170
Pilot Jet	35
Jet Needle/Clip position	5DP13/3
Needle Jet	O-6(169)
Throttle gap under cutaway (in/mm)	.240/6.1
Throttle slide cutaway	2.5AL
Valve seat	1.5 Viton
Starter jet	1.5
Pilot air jet	2.5
Fuel screw setting	N/A
Air screw setting	1.5
Recommended fuel octane (R+M/2)	87 non Oxy/Minimum

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	185 #4	180 #3	170 #3	170 #3	165 #3	160 #3	155 #3	150 #3
600-1200 (2000-4000)	175 #3	170 #3	160 #3	160 #3	155 #3	150 #3	140 #2	140 #2
1200-1800 (4000-6000)	165 #3	160 #3	155 #3	150 #3	145 #3	140 #2	130 #2	130 #2
1800-2400 (6000-8000)	155 #3	150 #3	140 #3	135 #3	135 #2	130 #2	120 #1	120 #1
2400-3000 (8000-10000)	145 #3	140 #3	130 #2	130 #2	125 #2	120 #1	110 #1	110 #1
3000-3700 (10000-12000)	135 #3	130 #2	120 #2	115 #2	115 #1	110 #1	100 #1	100 #1

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-900 (0-3000)	10	(110/290) Black-2287	Blue/ Black	54/38-25 LW ER	17:41-72
900-1800 (3000-6000)	10-M Blue	(110-290) Black-2287	Blue/ Black	54/38-25 LW ER	17:41-72
1800-2700 (6000-9000)	10 MW	(110-290) Black-2287	Blue/ Black	54/38-25 LW ER	17:41-72
2700-3700 (9000-12000)	10 MR	(110-290) Black-2287	Blue/ Black	54/38-25 LW ER	17:41-72
Drive clutch bolt torque 50 ft-lbs(69 N-m)					

Belt

Belt part number	3211078
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/20.1
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	12.25/46.4
Oil (qts/l)	3.25/3.1
Coolant (qts/l)	N/A
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	136/345
Lug height (in/cm)	1/2.5
Manufacture	Soucy
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	1.125 - 1.375 / 2.9 - 3.5

Front Suspension

Suspension type	Edge LX
IFS shocks	Arvin/7041932
IFS Spring PN	7041551
IFS Spring Pre-Load (in/mm)	.625/15.9
IFS spring rate (lb/in - kg/mm)	100/1.79
IFS Spring free length (in/cm)	10.75/27.3
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	.59±.31/15.0±7.9
Toe (in/mm)	.12-.25/3.0-6.35

Rear Suspension

Suspension type	Edge 136
Front track shock (FTS)	Arvin/7041939
FTS spring rate (lb/in - kg/mm)	200-240/3.6-4.3
FTS spring installed length (in/cm)	Fixed
Rear track shock	Arvin/7042138
Rear travel (in/cm)	13.9/35.3

Torsion Spring

Torsion spring PNs (LH/RH)	7041940/7041941
Torsion spring diameter (in/mm)	.405/10.3
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	47.25/120
Length (in/cm)	128/325.1
Height (in/cm)	49.5/125.7
Est dry weight lb/kg	517/234.7

Electrical

Ignition timing	26.5°@3000RPM
Spark plug gap (in/mm)	.028/.70
Spark plug	NGK BR8ES
Voltage regulator/output	240watt
CDI marking	CU7245
Flywheel Marking	FP9319

Features

Electric Fuel Gauge	Accessory
Electric Start	Standard
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard 5 inch
Tachometer	Accessory

WIDETRAK LX

MODEL S07SU4BS

Body

Body Style	GENII

Engine

Engine type	Fuji
Engine displacement	488cc
Engine model number	EC50PL237
Bore (in/mm)	2.83/72
Stroke (in/mm)	2.36/60
Piston to cylinder clearance (in/mm)	.0035-.0049/.090-.125
Piston ring end gap (in/mm)	.0070-.016/.20-.47
Operating RPM±200	7000
Idle RPM±200	1600
Clutch engagement RPM ±200	3800

Fuel Delivery

Type	VM34SS
Main Jet	195
Pilot Jet	35
Jet Needle/Clip position	6EJ26/2
Needle Jet	P-6 (166)
Throttle gap under cutaway (in/mm)	.240/6.1
Throttle slide cutaway	3
Valve seat	1.5 Viton
Starter jet	1.5
Pilot air jet	N/A
Fuel screw setting	N/A
Air screw setting	.5
Recommended fuel octane (R+M/2)	87 NonOxy/Minimum

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	210 #2	200 #2	195 #2	190 #2	185 #2	175 #2	170 #2	170 #1
600-1200 (2000-4000)	195 #2	185 #2	180 #2	175 #2	170 #2	165 #2	155 #1	155 #1
1200-1800 (4000-6000)	185 #2	175 #2	170 #2	165 #2	160 #1	155 #1	145 #1	145 #1
1800-2400 (6000-8000)	170 #2	165 #2	155 #2	155 #1	150 #1	140 #1	135 #1	135 #1
2400-3000 (8000-10000)	160 #2	155 #2	145 #1	145 #1	140 #1	130 #1	120 #1	120 #1
3000-3700 (10000-12000)	150 #2	140 #1	135 #1	130 #1	125 #1	120 #1	110 #1	110 #1

When using non oxygenated fuel with an octane number greater than 93, decrease the main jet number in the above chart by 5

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (P-85)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-900 (0-3000)	10	Brown	Silver	36D #2	19:41-66
900-1800 (3000-6000)	10	Red/ White	Silver	36D #2	19:41-66
1800-2700 (6000-9000)	10-M Blue	Red/ White	Silver	36D #2	19:41-66
2700-3700 (9000-12000)	10 MW	Red/ White	Silver	36D #2	19:41-66
Drive clutch bolt torque 50 ft-lbs (69 N-m)					

Belt

Belt part number	3211070
Belt width (in/cm)	1.375/3.49
Belt side angle	28°
Outside diameter (in/cm)	47.25/120
Clutch center distance (in/cm)	12/30.5

Chaincase

Center distance (in/cm)	N/A
Reverse type	Hi/Low/Reverse

Fluids and Capacities

Fuel (gal/l)	11/41.6
Oil (qts/l)	2/1.9
Coolant (qts/l)	3.4/3.2
Gearcase (oz/ml)	20/591.5
Brake fluid type	DOT4

Track

Width (in/cm)	20/51
Length (in/cm)	156/396
Lug height (in/cm)	1/2.5
Manufacture	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.75-1.0/1.9-2.5

Front Suspension

Suspension type	WideTrak GenII
IFS shocks	Arvin/7041535
IFS spring rate (lb/in - kg/mm)	105/1.9
Spring installed length (in/cm)	Fixed
Front vertical travel (in/cm)	7.25/18.4
Ski center distance (in/cm)	38/96.5
Camber (in/mm)	.82±.72/20.8±18.3
Toe (in/mm)	0-.12/0-3

Rear Suspension

Suspension type	WideTrak
Front track shock (FTS)	Arvin 7041742
FTS spring rate lbs-in/kg-mm	181/3.2
FTS spring installed length (in/cm)	Fixed
Rear track shock	Arvin/7042309
Rear travel (in/cm)	9/22.9

Torsion Spring

Torsion spring PNs (LH/RH)	7041239/7041240
Torsion spring diameter (in/mm)	.468/11.9
Torsion spring tail angle	74°

Dimensions

Width (in/cm)	43.5/110
Length (in/cm)	128/325
Height (in/cm)	51/130
Est dry weight lb/kg	643/291.9

Electrical

Ignition timing	28°@3000
Spark plug gap (in/mm)	.028/.71
Spark plug	Champion RN3C
Voltage regulator/output	200watt
CDI marking	IU2212
Flywheel Marking	FP5536

Features

Electric Fuel Gauge	N/A
Electric Start	Standard
Low Oil Light	Standard
Parking Brake	N/A
Speedometer	Standard 5 inch
Tachometer	Accessory

500 XC SP

MODEL S07NP5CS(E)

Body

Body Style	EDGE

Engine

Engine type	Liberty
Engine displacement	500
Engine model number	S3033-5044-PF5F
Bore (in/mm)	2.78/70.5
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.11-.15
Piston ring end gap (in/mm)	.014-.020/.40-.61
Operating RPM±200	8500
Idle RPM	1500
Clutch engagement RPM +/- 200	4200
Exhaust valve spring	Pink/Yellow

Fuel Delivery

Type	TM38
Main Jet	410
Pilot Jet	45
Jet Needle/Clip position	6BGY41/4
Needle Jet	P-8
Throttle gap under cutaway (in/mm)	.079/2
Throttle slide cutaway	2
Valve seat	1.5
Starter jet	145
Pilot air jet	N/A
Fuel screw setting	3
Air screw setting	1.25
Recommended fuel octane (R+M/2)	87 Min NonOxy

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	440 #3	430 #3	410 #2	400 #2	390 #2	380 #2	360 #2	350 #1
600-1200 (2000-4000)	420 #3	400 #2	390 #2	370 #2	360 #2	250 #2	330 #1	320 #1
1200-1800 (4000-6000)	390 #2	380 #2	360 #2	350 #2	340 #2	330 #1	310 #1	300 #1
1800-2400 (6000-8000)	370 #2	350 #2	340 #2	320 #2	310 #1	300 #1	290 #1	270 #1
2400-3000 (8000-10000)	340 #2	330 #2	310 #1	300 #1	290 #1	280 #1	260 #1	250 #1
3000-3700 (10000-12000)	320 #1	300 #1	290 #1	270 #1	260 #1	250 #1	240 #1	230 #1

When using non oxygenated fuel with an octane number greater than 93, decrease the main jet number in the above chart by 20.

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-900 (0-3000)	10-56	Black/ Green	Red/ Black	56/42-36 LW ER	22:40-74
900-1800 (3000-6000)	10-54	Black/ Green	Red/ Black	56/42-36 LW ER	22:40-74
1800-2700 (6000-9000)	10	Black/ Green	Red/ Black	56/42-36 LW ER	21:40-74
2700-3700 (9000-12000)	10M Blue	Black/ Green	Red/ Black	56/42-36 LW ER	21:40-74
Drive clutch bolt torque 50 ft-lbs (69 N-m)					

Belt

Belt part number	3211080
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/20.1
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.8/44.7
Oil (qts/l)	3.25/3.1
Coolant (qts/l)	5.6/5.3
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	121/307
Lug height (in/cm) [Euro]	.91/2.3 [1.25/31.75]
Manufacture	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.5/1-1.3

Front Suspension

Suspension type	Edge
IFS shocks	Arvin/7043082
IFS spring rate (lb/in - kg/mm)	68-160/1.22-2.9
IFS Spring installed length (in/cm)	10.5/26.7
Front vertical travel (in/cm)	10.3/26.2
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	.59±.31/15.0±7.9
Toe (in/mm)	.12-.25/3.0-6.35

Rear Suspension

Suspension type	Edge 121
Front track shock	Arvin/7041975
FTS Spring rate (lb/in - kg/mm)	160 Var/2.86 Var
FTS Spring installed length	7.46/18.9
Rear track shock	Arvin MPV/7043239
Rear travel (in/cm)	13.9/35.3

Torsion Spring

Torsion spring PNs (LH/RH)	7041942/7041943
Torsion spring diameter (in/mm)	.375/9.5
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	48/122
Length (in/cm)	113/287
Height (in/cm)	46/117
Est dry weight lb/kg	481/218.4

Electrical

Ignition timing	25°@2500RPM
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	280watt
CDI marking	4010829
Flywheel Marking	4010677

Features

Electric Fuel Gauge	Accessory
Electric Start	Accessory
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard 5 inch
Tachometer	Standard 5 inch

SUPER SPORT

MODEL S07NP5B(E,S)

Body

Body Style	EDGE

Engine

Engine type	Fuji
Engine Model	EC550PM100
Engine Displacement	544cc
Bore (in/mm)	2.87/73
Stroke (in/mm)	2.56/65
Piston to cylinder clearance (in/mm)	.0039-.0053/.10-.135
Piston ring end gap (in/mm)	.016-.022/.40-.55
Operating RPM±200	7000
Idle RPM±200	1600
Clutch engagement RPM ±200	3800
Exhaust valve spring	N/A

Fuel Delivery

Type	VM34
Main Jet	250
Pilot Jet	35
Jet Needle/Clip position	6DEH11/3
Needle Jet	Q-0 (480)
Throttle gap under cutaway (in/mm)	.256/6.5
Throttle slide cutaway	3
Valve seat	1.5 Viton
Starter jet	1.5
Pilot air jet	2.5
Fuel screw setting	N/A
Air screw setting	1.0
Recommended fuel octane (R+M/2)	87 NonOxy/Min.

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	270 #4	260 #4	250 #4	240 #3	230 #3	220 #3	210 #2	200 #1
600-1200 (2000-4000)	260 #4	250 #4	240 #3	230 #3	220 #3	220 #2	210 #2	200 #1
1200-1800 (4000-6000)	250 #4	240 #3	230 #3	220 #3	210 #2	210 #2	200 #1	190 #1
1800-2400 (6000-8000)	230 #3	220 #3	220 #3	210 #2	210 #2	200 #1	190 #1	180 #1
2400-3000 (8000-10000)	220 #3	210 #3	210 #2	200 #2	190 #1	190 #1	180 #1	170 #1
3000-3700 (10000-12000)	210 #3	200 #2	190 #2	190 #1	180 #1	180 #1	170 #1	160 #1

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:39- 72
600-1200 (2000-4000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:39- 72
1200-1800 (4000-6000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:39- 72
1800-2400 (6000-8000)	10-58	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	18:39- 72
2400-3000 8000-10000)	10-56	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	18:39- 72
3000-3600 (10000-12000)	10-56	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	18:39- 72
Drive clutch bolt torque 50 ft-lbs (69 N-m)					

Belt

Belt part number	3211078
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/18.52
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.8/44.7
Oil (qts/l)	3.25/3.1
Coolant (qts/l)	N/A
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	121/307
Lug height (in/cm)	.82/2.1
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.5/1-1.3

Front Suspension

Suspension type	Edge
IFS shocks	Arvin/7041932
IFS spring rate (lb/in - kg/mm)	100/1.79
Spring preload (in/cm)	.625/15.875
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	.59±.31/15.0±7.9
Toe (in/mm)	.12-.25/3.0-6.35

Rear Suspension

Suspension type	Edge 121
Front track shock (FTS)	Arvin/7041939*
FTS spring rate (lb/in - kg/mm)	200-240 / 3.6 - 4.4Var
FTS spring installed length (in/cm)	Fixed
Rear track shock	Arvin MPV/7043239
Rear travel (in/cm)	13.9/35.3
* notes that shock is serviceable	

Torsion Spring

Torsion spring PNs (LH/RH)	7041942/7041943
Torsion spring diameter (in/mm)	.375/9.5
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	48/122
Length (in/cm)	113/287
Height (in/cm)	45/114

Dimensions

Est dry weight lb/kg	460/208.7

Electrical

Ignition timing	27°@3000
Spark plug gap (in/mm)	.028/.70
Spark plug	NGK BR9ES
Voltage regulator/output	280watt
CDI marking	EC55PM 100/110
Flywheel Marking	FP6318

Features

Electric Fuel Gauge	Accessory
Electric Start	Accessory
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard 5 inch
Tachometer	Accessory

550 LX

MODEL S07ND5BS

Body

Body Style	EDGE

Engine

Engine type	Fuji
Engine Model	EC550PM110
Engine Displacement	544cc
Bore (in/mm)	2.87/73
Stroke (in/mm)	2.56/65
Piston to cylinder clearance (in/mm)	.0039-.0053/.10-.135
Piston ring end gap (in/mm)	.016-.022/.40-.61
Operating RPM±200	7000
Idle RPM±200	1600
Clutch engagement RPM ±200	3800
Exhaust valve spring	N/A

Fuel Delivery

Type	VM34
Main Jet	250
Pilot Jet	35
Jet Needle/Clip position	6BGY41/4
Needle Jet	Q-0 (480)
Throttle gap under cutaway (in/mm)	.256/6.5
Throttle slide cutaway	3
Valve seat	1.5 Viton
Starter jet	1.5
Pilot air jet	2.5
Fuel screw setting	N/A
Air screw setting	1.0
Recommended fuel octane (R+M/2)	87 NonOxy/Min.

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	270 #4	260 #4	250 #4	240 #3	230 #3	220 #3	210 #2	200 #1
600-1200 (2000-4000)	260 #4	250 #4	240 #3	230 #3	220 #3	220 #2	210 #2	200 #1
1200-1800 (4000-6000)	250 #4	240 #3	230 #3	220 #3	210 #2	210 #2	200 #1	190 #1
1800-2400 (6000-8000)	230 #3	220 #3	220 #3	210 #2	210 #2	200 #1	190 #1	180 #1
2400-3000 (8000-10000)	220 #3	210 #3	210 #2	200 #2	190 #1	190 #1	180 #1	170 #1
3000-3700 (10000-12000)	210 #3	200 #2	190 #2	190 #1	180 #1	180 #1	170 #1	160 #1

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:39- 72
600-1200 (2000-4000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:39- 72
1200-1800 (4000-6000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:39- 72
1800-2400 (6000-8000)	10-58	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	18:39- 72
2400-3000 8000-10000)	10-56	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	18:39- 72
3000-3600 (10000-12000)	10-56	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	18:39- 72
Drive clutch bolt torque 50 ft-lbs (69 N-m)					

Belt

Belt part number	3211078
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/18.52
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.8/44.7
Oil (qts/l)	3.25/3.1
Coolant (qts/l)	N/A
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	121/307
Lug height (in/cm)	.82/2.1
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.5/1-1.3

Front Suspension

Suspension type	Edge
IFS shocks	Arvin/7041932
IFS spring rate (lb/in - kg/mm)	100/1.79
Spring preload (in/cm)	.625/15.875
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	.59±.31/15.0±7.9
Toe (in/mm)	.12-.25/3.0-6.35

Rear Suspension

Suspension type	Edge 121
Front track shock (FTS)	Arvin/7041939*
FTS spring rate (lb/in - kg/mm)	200-240 / 3.6 - 4.4Var
FTS spring installed length (in/cm)	Fixed
Rear track shock	Arvin MPV/7043239
Rear travel (in/cm)	13.9/35.3
* notes that shock is serviceable	

Torsion Spring

Torsion spring PNs (LH/RH)	7041629/7041630
Torsion spring diameter (in/mm)	.375/9.5
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	48/122
Length (in/cm)	113/287
Height (in/cm)	45/114

Dimensions

Est dry weight lb/kg	460/208.7

Electrical

Ignition timing	27°@3000
Spark plug gap (in/mm)	.028/.70
Spark plug	NGK BR9ES
Voltage regulator/output	280watt
CDI marking	EC55PM 100/110
Flywheel Marking	FP6318

Features

Electric Fuel Gauge	Accessory
Electric Start	Standard
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard 5 inch
Tachometer	Accessory

TRAIL RMK

MODEL S07NJ5B(E,S)

Body

Body Style	EDGE

Engine

Engine type	Fuji
Engine Model	EC550PM110
Engine displacement	544cc
Bore (in/mm)	2.87/73
Stroke (in/mm)	2.56/65
Piston to cylinder clearance (in/mm)	.0039-.005/.10-.135
Piston ring end gap (in/mm)	.016-.022/.4-.61
Operating RPM±200	7000
Idle RPM	1600
Clutch engagement RPM ±200	3800

Fuel Delivery

Type	VM34
Main Jet	210
Pilot Jet	35
Jet Needle/Clip position	6BGY41/4
Needle Jet	Q-0 (480)
Throttle gap under cutaway (in/mm)	.264/6.71
Throttle slide cutaway	3
Valve seat	1.5 Viton
Starter jet	1.5
Pilot air jet	2.5
Fuel screw setting	N/A
Air screw setting	.75
Recommended fuel octane (R+M/2)	87 NonOxy/Min.

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	270 #4	260 #4	250 #4	240 #3	230 #3	220 #3	210 #2	200 #1
600-1200 (2000-4000)	260 #4	250 #4	240 #3	230 #3	220 #3	220 #3	210 #2	200 #1
1200-1800 (4000-6000)	250 #4	240 #3	230 #3	220 #3	210 #2	210 #2	200 #1	190 #1
1800-2400 (6000-8000)	230 #3	220 #3	220 #3	210 #2	210 #2	200 #1	190 #1	180 #1
2400-3000 (8000-10000)	220 #3	210 #3	210 #2	200 #2	190 #1	190 #1	180 #1	170 #1
3000-3700 (10000-12000)	210 #3	200 #2	190 #2	190 #1	180 #1	180 #1	170 #1	160 #1

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-64	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:43- 74
600-1200 (2000-4000)	10-62	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:43- 74
1200-1800 (4000-6000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:43- 74
1800-2400 (6000-8000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:43- 74
2400-3000 8000-10000)	10-58	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:43- 74
3000-3600 (10000-12000)	10-56	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	19:43- 74
Drive clutch bolt torque 50 ft-lbs (69 N-m)					

Belt

Belt part number	3211078
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/20.1
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.8/44.7
Oil (qts/l)	3.25/3.1
Coolant (qts/l)	Air
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	136/345
Lug height (in/cm)	1.25/3.2
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.50/1-1.3

Front Suspension

Suspension type	Edge RMK
IFS shocks	Arvin/7042107
IFS spring rate (lb/in - kg/mm)	80/1.4
Spring installed length (in/cm)	9.75/24.8
Front vertical travel (in/cm)	7.6/19.3
Ski center distance (in/cm)	41/104
Camber (in/mm)	.735±.31/18.7±7.9
Toe (in/mm)	0-.12

Rear Suspension

Suspension type	Edge RMK 136
Front track shock	Arvin/7042085
FTS spring rate (lb/in - kg/mm)	170/3.0
FTS spring installed length (in/cm)	Fixed
Rear track shock	7042058
Rear travel (in/cm)	13.8/35.1

Torsion Spring

Torsion spring PNs (LH/RH)	7041627/7041628
Torsion spring diameter (in/mm)	.347/8.8
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	45.5/115.6
Length (in/cm)	124/315
Height (in/cm)	48/123
Est dry weight lb/kg	475/215.7

Electrical

Ignition timing	27°@3000 RPM 14°@6500RPM
Spark plug gap (in/mm)	.028/.70
Spark plug	NGK BR9ES
Voltage regulator/output	280 watts
CDI marking	EC55PM100/110
Flywheel marking	FP6318

Features

Electric Fuel Gauge	Accessory
Electric Start	Standard
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard 5 inch
Tachometer	Accessory

TRAIL TOURING DELUXE

MODEL S07NT5B(E,S)(A)

Body

Body Style	EDGE

Engine

Engine type	Fuji
Engine Model	EC550PM100
Engine displacement	544cc
Bore (in/mm)	2.87/73
Stroke (in/mm)	2.56/65
Piston to cylinder clearance (in/mm)	.0039-.005/.10-.135
Piston ring end gap (in/mm)	.016-.022/.4-.61
Operating RPM±200	7000
Idle RPM	1600
Clutch engagement RPM ±200	3800

Fuel Delivery

Type	VM34
Main Jet	250
Pilot Jet	35
Jet Needle/Clip position	6BGY41/4
Needle Jet	Q-0 (480)
Throttle gap under cutaway (in/mm)	.256/6.5
Throttle slide cutaway	3
Valve seat	1.5 Viton
Starter jet	1.5
Pilot air jet	2.5
Fuel screw setting	N/A
Air screw setting	1.0
Recommended fuel octane (R+M/2)	87 NonOxy/Min.

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	270 #4	260 #4	250 #4	240 #3	230 #3	220 #3	210 #2	200 #1
600-1200 (2000-4000)	260 #4	250 #4	240 #3	230 #3	220 #3	220 #3	210 #2	200 #1
1200-1800 (4000-6000)	250 #4	240 #3	230 #3	220 #3	210 #2	210 #2	200 #1	190 #1
1800-2400 (6000-8000)	230 #3	220 #3	220 #3	210 #2	210 #2	200 #1	190 #1	180 #1
2400-3000 (8000-10000)	220 #3	210 #3	210 #2	200 #2	190 #1	190 #1	180 #1	170 #1
3000-3700 (10000-12000)	210 #3	200 #2	190 #2	190 #1	180 #1	180 #1	170 #1	160 #1

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	21:41-74
600-1200 (2000-4000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	21:41-74
1200-1800 (4000-6000)	10-60	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	21:41-74
1800-2400 (6000-8000)	10-58	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	20:41-74
2400-3000 8000-10000)	10-56	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	20:41-74
3000-3600 (10000-12000)	10-56	Dark Blue/ White	Red/Blue	(56/42-.36) LW ER	20:41-74
Drive clutch bolt torque 50 ft-lbs (69 N-m)					

Belt

Belt part number	3211078
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/20.1
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	12.25/46.4
Oil (qts/l)	3.25/3.1
Coolant (qts/l)	N/A
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	136/345
Lug height (in/cm)	1/2.5
Manufacturer	Soucy
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	1.125 - 1.375 / 2.9 - 3.5

Front Suspension

Suspension type	Edge
IFS shocks	Arvin/7041918
IFS spring rate (lb/in - kg/mm)	90-180/1.6-3.2
IFS Spring Pre-Load (in/cm)	1/2.54
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	.59±.31/15.0±7.9
Toe (in/mm)	.12-.25/3.0-6.35

Rear Suspension

Suspension type	Edge 136
Front track shock (FTS)	Arvin/7041939
FTS spring rate	200-240 / 3.6 - 4.4Var
FTS spring installed length	Fixed
Rear track shock (RTS)	Arvin/7042138
Rear travel (in/cm)	13.9/33.5

Torsion Spring

Torsion spring PNs (LH/RH)	7042240/7042241
Torsion spring diameter (in/mm)	.405/10.3
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	48/122
Length (in/cm)	128/325
Height (in/cm)	49.5/126
Est dry weight lb/kg	570/258.8

Electrical

Ignition timing	27°@3000 14°@6500
Spark plug gap (in/mm)	.028/.70
Spark plug	NGK BR9ES
Voltage regulator/output	280watt
CDI marking	EC55PM 100/110
Flywheel Marking	FP6318

Features

Electric Fuel Gauge	Accessory
Electric Start	Standard
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard 5 inch
Tachometer	Accessory

600 HO IQ

MODEL S07PP6FS(A,B)

Body

Body Style	IQ

Engine

Engine type	Liberty
Engine Model	S3273-6044-PF6F
Engine displacement	599
Bore (in/mm)	3.04/77.25
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.115-.149
Piston ring end gap (in/mm)	.014-.020/.0356-.508
Operating RPM±200	8100
Idle RPM	1500
Clutch engagement RPM ±200	3800
Exhaust valve spring	Pink

Fuel Delivery

Type	TM38
Main Jet	420
Pilot Jet	50
Jet Needle/Clip position	9DGN6-57/2
Needle Jet	P-8
Throttle gap under cutaway (in/mm)	0.08/2.1
Throttle slide cutaway	1.5 Notch
Valve seat	1.5
Starter jet	145
Pilot air jet	.6
Fuel screw setting	1.25
Air screw setting	N/A
Recommended fuel octane (R+M/2)	91 Min. NonOxy

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	440 #3	430 #3	420 #2	400 #2	390 #2	380 #2	370 #2	360 #1
600-1200 (2000-4000)	410 #3	400 #3	390 #2	370 #2	360 #2	350 #2	340 #1	330 #1
1200-1800 (4000-6000)	370 #3	360 #2	350 #2	340 #2	330 #2	320 #1	310 #1	300 #1
1800-2400 (6000-8000)	340 #3	320 #2	310 #2	300 #2	280 #2	280 #1	270 #1	260 #1
2400-3000 (8000-10000)	310 #2	300 #2	290 #2	280 #1	270 #1	260 #1	250 #1	240 #1
3000-3700 (10000-12000)	290 #2	280 #2	270 #1	250 #1	240 #1	230 #1	220 #1	210 #1

When using non oxygenated fuel with a research octane Number (RON) greater than 93, decrease the main jet number in the above chart by 10 and raise the E-clip one position. If the above chart recommends clip #1, install washer on top when using the above fuel.

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Black/Green	Red/Black	(64/42-.36) LW ER	23:39-76
600-1200 (2000-4000)	10-60	Black/Green	Red/Black	(56/42-.36) LW ER	22:39-76
1200-1800 (4000-6000)	10-58	Black/Green	Red/Black	(56/42-.36) LW ER	22:40-76
1800-2400 (6000-8000)	10-56	Black/Green	Red/Black	(56/42-.36) LW ER	22:40-76
2400-3000 8000-10000)	10-54	Black/Green	Red/Black	(56/42-.36) LW ER	20:41-76
3000-3600 (10000-12000)	10 AL	Black/Green	Red/Black	(56/42-.36) LW ER	20:41-76

Drive clutch bolt torque 50 ft-lbs (69 N-m)

Belt

Belt part number	3211080
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	8.373/21.3
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	10.8/40.9
Oil (qts/l)	3.4/3.2
Coolant (qts/l)	6.3/6.0
Chaincase (oz/ml)	11/325.3
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	121/307
Lug height (in/cm)	1/2.5(std) 1.25/3.175(opt)
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.875-1.125/2.2-2.9

Front Suspension

Suspension type	IQ
IFS shocks	Arvin/7043245*(Std.) Fox/7043268* LH, 7043269 *RH (Opt)
IFS spring rate (lb/in - kg/mm)	100/1.79 (Std & Opt)
IFS Spring installed length (in/cm)	10.55/26.8 (Std & Opt)
Front vertical travel (in/cm)	10.25.4
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	2.25±.31/5.7±.79
Toe (in/mm)	0-.12/0-3.0
* notes that shock is serviceable	

Rear Suspension

Suspension type	IQ 121
Front track shock (FTS)	Arvin/7043244* (Std) Fox/7043267* (Opt)
FTS spring rate (lb/in - kg/mm)	130-270/2.3-4.8 (Std & Opt)
FTS installed length (in/mm)	7.97/20.2 (Std & Opt)
Rear track shock (RTS)	Fox/7043177*(Std) Fox/7043266*(Opt)
Rear Suspension Travel (in/cm)	13.9/35.3
* notes that shock is serviceable	

Torsion Spring

Torsion spring PN (LH/RH)	7043070/7043071
Torsion spring diameter (in/mm)	.374/9.5
Torsion spring tail angle	80°

Dimensions

Width (in/cm)	47.25/120
Length (in/cm)	115/292
Height (in/cm)	48/122
Est dry weight lb/kg	497/255.6

Electrical

Ignition timing	26°@3500RPM (TPS Unplugged)
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	280watt
CDI marking	4011033
Flywheel marking	4010677

Features

Electric Fuel Gauge	N/A
Electric Start	Optional
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard
Tachometer	Standard

600 HO IQ CLEANFIRE

MODEL S07PP6HS(A,B)

Body

Body Style	IQ

Engine

Engine type	Liberty
Engine Model	S3206-6044-PF6H
Engine displacement	599
Bore (in/mm)	3.04/77.25
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.115-.149
Piston ring end gap (in/mm)	.014-.020/.0356-.508
Operating RPM±200	8250
Idle RPM	1700
Clutch engagement RPM ±200	3800
Exhaust valve spring	Purple

Fuel Delivery

Type	Injected
Throttle Body Manufacturer	Mikuni
Throttle Body Bore Size (in/mm)	1.81/46
Fuel Injection Type	Kokusan
Regulator Pressure (psi/Bar)	58/4
TPS Voltage at Idle	.95 ±.01v
Throttle Gap @ Idle	0
Recommended fuel octane (R+M/2)	91 Min. NonOxy

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Black/Green	Red/Black	(64/42-.36) LW ER	23:39-76
600-1200 (2000-4000)	10-60	Black/Green	Red/Black	(56/42-.36) LW ER	22:39-76
1200-1800 (4000-6000)	10-58	Black/Green	Red/Black	(56/42-.36) LW ER	22:40-76
1800-2400 (6000-8000)	10-56	Black/Green	Red/Black	(56/42-.36) LW ER	22:40-76
2400-3000 8000-10000)	10-54	Black/Green	Red/Black	(56/42-.36) LW ER	20:41-76
3000-3600 (10000-12000)	10 AL	Black/Green	Red/Black	(56/42-.36) LW ER	20:41-76
Drive clutch bolt torque 80 ft-lbs (108Nm)					

Belt

Belt part number	3211080
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	8.373/21.3
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.7/44.3
Oil (qts/l)	3.4/3.2
Coolant (qts/l)	6.3/6
Chaincase (oz/ml)	11/325.3
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	121/307
Lug height (in/cm)	1/2.5(std) 1.25/3.175(opt)
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.875-1.125/2.2-2.9

Front Suspension

Suspension type	IQ
IFS shocks	Arvin/7043245*(Std.) Fox/7043268* LH, 7043269* RH (Opt)
IFS spring rate (lb/in - kg/mm)	100/1.79 (Std & Opt)
IFS Spring installed length (in/cm)	10.55/26.8 (Std & Opt)
Front vertical travel (in/cm)	10.25.4
Ski center distance (in/cm)	42.5/108
Camber (in/mm)	2.25±.31/5.7±.79
Toe (in/mm)	0-.12/0-3.0
* notes that shock is serviceable	

Rear Suspension

Suspension type	IQ 121
Front track shock (FTS)	Arvin/7043244* (Std) Fox/7043267* (Opt)
FTS spring rate (lb/in - kg/mm)	130-270/2.3-4.8 (Std & Opt)
FTS installed length (in/mm)	7.97/20.2 (Std & Opt)
Rear track shock (RTS)	Fox/7043177*(Std) Fox/7043266*(Opt)
Rear Suspension Travel (in/cm)	13.9/35.3
* notes that shock is serviceable	

Torsion Spring

Torsion spring PN (LH/RH)	7043070/7043071
Torsion spring diameter (in/mm)	.374/9.5
Torsion spring tail angle	80°

Dimensions

Width (in/cm)	47.25/120
Length (in/cm)	115/292
Height (in/cm)	48/122
Est dry weight lb/kg	497/255.6

Electrical

Ignition timing	18° @ 1700 RPM (±200 RPM) & 120° F (±10° F) 49 ° C (±12° C) water temp
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	400watt

Features

Electric Fuel Gauge	Standard
Electric Start	Optional
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard
Tachometer	Standard

600 HO IQ LX CLEANFIRE

MODEL S07PD6HS

Body

Body Style	IQ Luxury

Engine

Engine type	Liberty
Engine displacement	599
Engine model number	S3206-6044-PF6H
Bore (in/mm)	3.04/77.25
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.115-.149
Piston to cylinder service limit (in/mm)	.0059/.149
Piston ring end gap (in/mm)	.014-.020/.0356-.508
Operating RPM±200	8250
Idle RPM	1700
Clutch engagement RPM ±200	3800
Exhaust valve spring	Purple

Fuel Delivery

Type	Injected
Throttle Body Manufacturer	Mikuni
Throttle Body Bore Size (in/mm)	1.81/46
Fuel Injection Type	Kokusan
Regulator Pressure (psi/Bar)	58/4
TPS Voltage at Idle	.95 ±.01v
Throttle Gap @ Idle	0
Recommended fuel octane (R+M/2)	91 Min. NonOxy

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Black/Green	Red/Black	(64/42-.36) LW ER	22:39-76
600-1200 (2000-4000)	10-60	Black/Green	Red/Black	(56/42-.36) LW ER	22:39-76
1200-1800 (4000-6000)	10-58	Black/Green	Red/Black	(56/42-.36) LW ER	22:40-76
1800-2400 (6000-8000)	10-56	Black/Green	Red/Black	(56/42-.36) LW ER	22:40-76
2400-3000 8000-10000)	10-54	Black/Green	Red/Black	(56/42-.36) LW ER	20:41-76
3000-3600 (10000-12000)	10 AL	Black/Green	Red/Black	(56/42-.36) LW ER	20:41-76
Drive clutch bolt torque 80 ft-lbs (108Nm)					

Belt

Belt part number	3211080
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/20.1
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.7/44.3
Oil (qts/l)	3.4/3.2
Coolant (qts/l)	7/6.6
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT4

Track

Width (in/cm)	15/38
Length (in/cm)	128/325
Lug height (in/cm)	1/2.5
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.875-1.13/2.2-2.9

Front Suspension

Suspension type	IQ
IFS shocks	Arvin /7043054
IFS spring rate (lb/in - kg/mm)	120/2.1
IFS Spring installed length (in/cm)	9.95/25.3
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	41.16" 104.5
Camber (in/mm)	2.25" ±.31" 5.7 ±.79
Toe (in/mm)	0-.12" 0-3
* notes that shock is serviceable	

Rear Suspension

Suspension type	M-10 128
Front track shock (FTS)	Arvin /7043243
FTS spring rate (lb/in - kg/mm)	160/2.86
FTS spring installed length (in/cm)	8/20.3
Rear track shock (RTS)	Fox /7043216*
Rear travel (in/cm)	13/33
* notes that shock is serviceable	

Dimensions

Width (in/cm)	47.25/120
Length (in/cm)	116/295
Height (in/cm)	51/130
Est dry weight lb/kg	505/229.3

Electrical

Ignition timing	18° @ 1700 RPM (±200 RPM) & 120° F (±10° F) 49 ° C (±12° C) water temp
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	400watt
Base ECU	4011518

600 HO SWITCHBACK

MODEL S07PS6FS(A)

Engine

Engine type	Liberty
Engine displacement	599cc
Engine model number	S3273-6044-PF6F
Bore (in/mm)	3.04/77.25
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.114-.150
Piston ring end gap (in/mm)	.014-.020/.36-.51
Operating RPM±200	8100
Idle RPM±200	1500
Clutch engagement RPM ±200	3800
Exhaust valve spring	Pink

Fuel Delivery

Type	TM38
Main Jet	420
Pilot Jet	50
Jet Needle/Clip position	9DGN6-57/2
Needle Jet	P-8
Throttle gap under cutaway (in/mm)	0.08/2.1
Throttle slide cutaway	1.5 Notch
Valve seat	1.5
Starter jet	145
Pilot air jet	.6
Fuel screw setting	1.25
Air screw setting	N/A
Recommended fuel octane (R+M/2)	91

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	440 #3	430 #3	420 #2	400 #2	390 #2	380 #2	370 #2	360 #1
600-1200 (2000-4000)	410 #3	400 #3	390 #2	370 #2	360 #2	350 #2	340 #1	330 #1
1200-1800 (4000-6000)	370 #3	360 #2	350 #2	340 #2	330 #2	320 #1	310 #1	300 #1
1800-2400 (6000-8000)	340 #3	320 #2	310 #2	300 #2	280 #1	280 #1	270 #1	260 #1
2400-3000 (8000-10000)	310 #2	300 #2	290 #2	280 #1	270 #1	260 #1	250 #1	240 #1
3000-3700 (10000-12000)	290 #2	280 #2	270 #1	250 #1	240 #1	230 #1	220 #1	210 #1

When using non oxygenated fuel with an octane number greater than 93, decrease the main jet number in the above chart by 10 and raise the E-clip one position. If already in position #1 install washer on top when using the above fuel.

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Black/ Green	Red/ Black	64/42-36 ER	22:39-76
600-1200 (2000-4000)	10-60	Black/ Green	Red/ Black	56/42-36 ER	22:39-76
1200-1800 (4000-6000)	10-58	Black/ Green	Red/ Black	56/42-36 ER	22:39-76
1800-2400 (6000-8000)	10-56	Black/ Green	Red/ Black	56/42-36 ER	20:41-76
2400-3000 (8000-10000)	10-54	Black/ Green	Red/ Black	56/42-36 ER	20:41-76
3000-3700 (10000-12000)	10AL	Black/ Green	Red/ Black	56/42-36 ER	20:41-76

Drive clutch bolt torque 50 ft-lbs (69 N-m)

Belt

Belt part number	3211080
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	8.373/21.27
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	10.8/40.9
Oil (qts/l)	3.4/3.2
Coolant (qts/l)	6...3/6
Chaincase (oz/ml)	11/325.3
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	144/366
Lug height (in/cm)	1.25/3.2 (Std) 1.50/3.8(Opt)
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.50/1-1.3

Front Suspension

Suspension type	IQ 42.5
IFS shocks	Fox/7043141* (Std) Fox/ 7043268*,7043269* (Option)
IFS spring rate (lb/in - kg/mm)	100/1.79 (Std & Opt)
Spring installed length (in/cm)	10.55/26.8 (Std & Opt)
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	42.5/108
Camber (in/cm)	2.25±.31/5.7±.79
Toe (in/mm)	0-.12/0-3.0
* notes that shock is serviceable	

Rear Suspension

Suspension type	IQ Switchback
Front track shock (FTS)	Fox/7043142*
FTS spring rate lbs-in/kg-mm	170/3.0
FTS spring installed length (in/cm)	7.25/18.4
Rear track shock	Fox/7043246*
Rear travel (in/cm)	13.9/35.3
* notes that shock is serviceable	

Torsion Spring

Torsion spring PNs (LH/RH)	7041629/7041630
Torsion spring diameter (in/mm)	.359/9.12
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	47.25/120
Length (in/cm)	126/320
Height (in/cm)	48/122
Est dry weight lb/kg	483/219

Electrical

Ignition timing	26°@3500 w/TPS unplugged
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	280w
CDI marking	4011033
Flywheel marking	4010677

600 HO SWITCHBACK CLEANFIRE

MODEL S07PS6HS(A,B)

Engine

Engine type	Liberty
Engine displacement	599cc
Engine model number	S3206-6044-PF6H
Bore (in/mm)	3.04/77.25
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.115-.149
Piston ring end gap (in/mm)	.014-.020/.36-.51
Operating RPM±200	8250
Idle RPM±200	1700
Clutch engagement RPM ±200	3800
Exhaust valve spring	Purple

Fuel Delivery

Type	Injected
Throttle Body Manufacturer	Mikuni
Throttle Body Bore Size (in/mm)	1.81/46
Fuel Injection Type	Kokusan
Regulator Pressure (psi/Bar)	58/4
TPS Voltage at Idle	.95 ±.01v
Throttle Gap @ Idle	0
Recommended fuel octane (R+M/2)	91 Min. NonOxy

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Black/ Green	Red/ Black	64/42-36 ER	22:39-76
600-1200 (2000-4000)	10-60	Black/ Green	Red/ Black	56/42-36 ER	22:39-76
1200-1800 (4000-6000)	10-58	Black/ Green	Red/ Black	56/42-36 ER	22:40-76
1800-2400 (6000-8000)	10-56	Black/ Green	Red/ Black	56/42-36 ER	20:41-76
2400-3000 (8000-10000)	10-54	Black/ Green	Red/ Black	56/42-36 ER	20:41-76
3000-3700 (10000-12000)	10AL	Black/ Green	Red/ Black	56/42-36 ER	20:41-76
Drive clutch bolt torque 80 ft-lbs (108Nm)					

Belt

Belt part number	3211080
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	8.373/21.27
Reverse type	PERC

Fluids and capacities

Fuel (gal/l)	11.7/44.3
Oil (qts/l)	3.4/3.2
Coolant (qts/l)	6.3/6
Chaincase (oz/ml)	11/325.3
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	144/366
Lug height (in/cm)	1.25/3.2 (Std) 1.50/3.8 (Option)
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.50/1-1.3

Front Suspension

Suspension type	IQ 42.5
IFS shocks	Fox/7043141* (Std) Fox/7043268*, 7043269*(Option)
IFS spring rate lbs-in/kg-mm	100/1.79 (Std & Opt)
Spring installed length (in/cm)	10.55/26.8 (Std & Opt)
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	42.5/108
Camber (in/cm)	2.25±.31/5.7±.79
Toe (in/mm)	0-.12/0-3.0
* notes that shock is serviceable	

Rear Suspension

Suspension type	IQ Switchback
Front track shock (FTS)	Fox/7043142*
FTS spring rate (lb/in - kg/mm)	170/3.0
FTS spring installed length (in/cm)	7.25/18.4
Rear track shock	Fox/7043246*
Rear travel (in/cm)	13.9/35.3
* notes that shock is serviceable	

Torsion Spring

Torsion spring PNs (LH/RH)	7041629/7041630
Torsion spring diameter (in/mm)	.359/9.12
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	46.5/118
Length (in/cm)	128/325
Height (in/cm)	46.5/118
Est dry weight lb/kg	489/222

Electrical

Ignition timing	18° @ 1700 RPM (±200 RPM) & 120° F (±10° F) 49 ° C (±12° C) water temp
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	400w@4000RPM

Features

Electric Fuel Gauge	Standard
Electric Start	Optional
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard
Tachometer	Standard

600 HO RMK 144/155 (F/O)

MODEL S07(P,M)(M,K)6FS(A)

Body

Body Style	IQ

Engine

Engine type	Liberty
Engine displacement	599cc
Engine model number	S3274-6044-PF6F
Bore (in/mm)	3.04/77.25
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.114-.150
Piston ring end gap (in/mm)	.014-.020/.36-.51
Operating RPM±200	8100
Idle RPM	1500
Clutch engagement RPM±200	3800
Exhaust valve spring	Pink

Fuel Delivery

Type	TM38
Main Jet	280
Pilot Jet	50
Jet Needle/Clip position	9DGN6-57/1
Needle Jet	P-8
Throttle gap under cutaway (in/mm)	0.13/3.2
Throttle slide cutaway	2.5
Valve seat	1.5
Starter jet	145
Pilot air jet	.6
Fuel screw setting	1
Air screw setting	N/A
Recommended fuel octane (R+M/2)	91

Jetting

Altitude meters (feet)	Ambient Temperature							
	< -25°F/<-35°C	-30°F to -10°F/-34°C to -23°C	-15°F to +5°F/-26°C to -15°C	0°F to +20°F/-18°C to -7°C	+15°F to +35°F/-9°C to +2°C	+30°F to +50°F/-1°C to +10°C	+45°F to +65°F/+7°C to +18°C	>+60°F/>+16°C
0-600 (0-2000)	440 #3	430 #3	420 #2	400 #2	390 #2	380 #2	370 #2	360 #1
600-1200 (2000-4000)	410 #3	400 #3	390 #2	370 #2	360 #2	350 #2	340 #1	330 #1
1200-1800 (4000-6000)	370 #3	360 #2	350 #2	340 #2	330 #2	320 #1	310 #1	300 #1
1800-2400 (6000-8000)	340 #3	320 #2	310 #2	300 #2	280 #1	280 #1	270 #1	260 #1
2400-3000 (8000-10000)	310 #2	300 #2	290 #2	280 #1	270 #1	260 #1	250 #1	240 #1
3000-3700 (10000-12000)	290 #2	280 #2	270 #1	250 #1	240 **	230 **	220 **	210 **

** Denotes clip in position #1 with the washer on top. When using non oxygenated fuel with an octane number greater than 93, decrease the main jet number in the above chart by 10 and raise the E-clip one position to **. If already in position ** no adjustment is needed.

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-62	Black/ Green	Red/ Black	56/42-36	19:41-76
600-1200 (2000-4000)	10-60	Black/ Green	Red/ Black	56/42-36	19:41-76
1200-1800 (4000-6000)	10-58	Black/ Green	Red/ Black	56/42-36	19:41-76
1800-2400 (6000-8000)	10-56	Black/ Green	Red/ Black	56/42-36	19:41-76
2400-3000 (8000-10000)	10-54	Black/ Green	Red/ Black	56/42-36	19:41-76
3000-3700 (10000-12000)	10AL	Black/ Green	Red/ Black	56/42-36	19:41-76

Drive clutch bolt torque 50 ft-lbs (69 N-m)

Belt

Belt part number	3211115
Belt width (in/cm)	1.460/3.7
Belt side angle	26°
Outside diameter (in/cm)	46.77/118.8
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	8.373/21.27
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	12.1/45.8
Oil (qts/l)	3/2.8
Coolant (qts/l)	6.3/6
Chaincase (oz/ml)	11/325.3
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	144/366 151/384
Lug height (in/cm)	144=2/5 151=2.4/6.1
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.50/1-1.3

Front Suspension

Suspension type	IQ RMK
IFS shocks (Std)	Arvin/7043222
IFS spring rate (lb/in - kg/mm)	100/1.8
IFS shocks (Premium)	WE Air/7043233*
IFS nitrogen charge	215 psi/14.8 bar nitrogen
IFS spring installed length (in/cm)	10.35/26.3
Front vertical travel (in/cm)	9/22.9
Ski center distance (in/cm)	38.67/98.2
Camber (in/cm)	2.17±.31/5.5±.79
Toe (in/mm)	0-.12/0-3.0
* notes that shock is serviceable	

Rear Suspension

Suspension type	IQ RMK 144/155
Std. Front track shock (FTS)	Arvin/7043048 (Std)
FTS spring rate (lb/in - kg/mm)	190/3.4 (Std)
Prem. Front track shock (FTS)	WE Air/7043234* (Premium)
FTS nitrogen charge	215 psi / 14.8 bar nitrogen (Premium)

Rear Suspension

FTS spring installed length (in/cm)	7.4/18.8 (Std) No Spring (Premium)
Rear track shock	Arvin/7043047
Rear track shock Premium	WE/7043235*
Rear travel (in/cm)	144=14.5/36.8 155=15.5/39.4
* notes that shock is serviceable	

Torsion Spring

Torsion spring PNs (LH/RH)	7041629/7041630
Torsion spring diameter (in/mm)	.359/9.12
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	46.5/118
Length (in/cm)	144=125/318 155=130.5/331
Height (in/cm)	46.5/118
Est dry weight lb/kg	144=472/214.3 155=478/217

Electrical

Ignition timing	26°@3500 w/TPS unplugged
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	280w
CDI marking	4011033
Flywheel marking	4010677

Features

Electric Fuel Gauge	N/A
Electric Start	(144) Accessory (155) Optional
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard
Tachometer	Standard

600 HO IQ TOURING CLEANFIRE

MODEL S07PT6HS

Body

Body Style	IQ Touring

Engine

Engine type	Liberty
Engine displacement	599
Engine model number	S3206-6044-PF6H
Bore (in/mm)	3.04/77.25
Stroke (in/mm)	2.52/64
Piston to cylinder clearance (in/mm)	.0045-.0059/.115-.149
Piston ring end gap (in/mm)	.014-.020/.356-.508
Operating RPM±200	8250
Idle RPM	1700
Clutch engagement RPM ±200	3800
Exhaust valve spring	Purple

Fuel Delivery

Type	Injected
Throttle Body Manufacturer	Mikuni
Throttle Body Bore Size (in/mm)	1.81/46
Fuel Injection Type	Kokusan
Regulator Pressure (psi/Bar)	58/4
TPS Voltage at Idle	.95 ±.01v
Throttle Gap @ Idle	0
Recommended fuel octane (R+M/2)	91 Min. NonOxy

Clutching

Altitude meters (feet)	Drive Clutch (P-85)		Driven Clutch (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-900 (0-3000)	10-62	Black/ Green	Red/ Black	64/42-36 LW ER	22:43-78
900-1500 (3000-5000)	10-60	Black/ Green	Red/ Black	56/42-36 LW ER	22:43-78
1500-2100 (5000-7000)	10-58	Black/ Green	Red/ Black	56/42-36 LW ER	22:43-78
2100-2700 (7000-9000)	10-56	Black/ Green	Red/ Black	56/42-36 LW ER	21:44-78
2700-3350 (9000-11000)	10-54	Black/ Green	Red/ Black	56/42-36 LW ER	21:44-78
3350-4000 (11000-13000)	10AL	Black/ Green	Red/ Black	56/42-36 LW ER	21:44-78
Drive clutch bolt torque 80 ft-lbs (108Nm)					

Belt

Belt part number	3211080
Belt width (in/cm)	1.438/3.65
Belt side angle	28°
Outside diameter (in/cm)	46.625/118.4
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	7.92/20.1
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	11.7/44.3
Oil (qts/l)	3.4/3.2
Coolant (qts/l)	7/6.6
Chaincase (oz/ml)	9/266.2
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	136/345
Lug height (in/cm)	1/2.5
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.75-1.0/1.9-2.5

Front Suspension

Suspension type	IQ
IFS shocks	Arvin/7043054
IFS spring rate (lb/in - kg/mm)	122-2.1
Spring installed length (in/cm)	9.95/25.3
Front vertical travel (in/cm)	10/25.4
Ski center distance (in/cm)	41.16" 104.5
Camber (in/mm)	2.25" ±.31" 5.7 ±.79
Toe (in/mm)	0-.12" 0-3
* notes that shock is serviceable	

Rear Suspension

Suspension type	M-10 136
Front track shock (FTS)	Arvin /7043207
FTS spring rate lbs-in/kg-mm	220/3.9
FTS spring installed length (in/cm)	8.5/21.6
Rear track shock	Fox /7043216*
Rear travel (in/cm)	14/35.6
* notes that shock is serviceable	

Dimensions

Width (in/cm)	48/121.9
Length (in/cm)	129/327.7
Height (in/cm)	53/134.6
Est dry weight lb/kg	574/260.6

Electrical

Ignition timing	18° @ 1700 RPM (±200 RPM) & 120° F (±10° F) 49 ° C (±12° C) water temp
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Voltage regulator/output	280watt
Base ECU	4011518

DRAGON

MODEL NUMBER: S07PC7J(E,S)

Engine

Engine type	Liberty
Engine displacement	700cc
Engine model number	S3305-7044-PF7J
Bore (in/mm)	3.19/81
Stroke (in/mm)	2.68/68
Piston to cylinder clearance (in/mm)	.0045-.0059/.115-.149
Piston ring end gap (in/mm)	.014-.020/.356-.508
Operating RPM ±200	8250
Idle RPM	1700
Clutch engagement RPM ±200	3800
Exhaust valve spring	Purple

Fuel Delivery

Type	Injected
Throttle Body Manufacturer	Mikuni
Throttle Body Bore Size (in/mm)	1.81/46
Fuel Injection Type	Kokusan
Regulator Pressure (psi/Bar)	58/4
TPS Voltage at Idle	.95 ±.01v
Throttle Gap @ Idle	0
Recommended fuel octane (R+M/2)	91 Min. NonOxy

Clutching

ALTITUDE meters (feet)	DRIVE CLUTCH (P-85)		DRIVEN CLUTCH (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-64	Dark Blue / White	Red/Black	66/44-46 LW ER	23:39-76
600-1200 (2000-4000)	10-62	Dark Blue / White	Red/Black	66/44-46 LW ER	23:39-76
1200-1800 (4000-6000)	10-62	Black / Green	Red/Black	64/42-36 LW ER	23:39-76
1800-2400 (6000-8000)	10-60	Black / Green	Red/Black	64/42-36 LW ER	22:39-76
2400-3000 (8000-10000)	10-58	Black / Green	Red/Black	56/42-36 LW ER	20:41-76
3000-3600 (10000-12000)	10-56	Black / Green	Red/Black	56/42-36 LW ER	20:41-76
Drive clutch bolt torque 80 ft-lb (108Nm)					

Belt

Belt part number	3211115
Belt width (in/cm)	1.460/3.7
Belt side angle	26°
Outside diameter (in/cm)	46.77/118.8
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	8.373/21.27
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	10.8/40.9
Oil (qts/l)	3.4/3.2
Coolant (qts/l)	N/A
Chaincase (oz/ml)	11/325.3
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	121/307
Lug height (in/cm)	1.25/3.2
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.875-1.125/2.2-.9

Front Suspension

Suspension type	IQ 121 Dragon
IFS shocks	Walker/7043206*
IFS spring rate lbs-in/kg-mm	100/1.79
Spring installed length (in/cm)	11.17/28.4
Front vertical travel (in/cm)	10.55/26.8
Ski center distance (in/cm)	42.5/108
Camber (in/cm)	2.25±.31/5.7±.79
Toe (in/mm)	0-.12/0-3.0
* notes that shock is serviceable	

Rear Suspension

Suspension type	IQ 121
Front track shock (FTS)	Walker/7043204*
FTS spring rate (lbs/in-kg/mm)	130-270/2.3-4.8
FTS spring installed length (in/cm)	7.97/20.2
Rear track shock	Walker/7043205*
Rear vertical travel (in/cm)	13.9/35.3
* notes that shock is serviceable	

Torsion Spring

Torsion spring PNs (LH/RH)	7043070/7043071
Torsion spring diameter (in/mm)	.347
Torsion spring tail angle	80°

Dimensions

Width (in/cm)	47.25/120
Length (in/cm)	115/292
Height (in/cm)	47/119
Est dry weight lb/kg	476/216.4

Electrical

Stator output	400w
Ignition timing BTDC @ RPM	18° @ 1700 RPM (±200 RPM) & 120° F (±10° F) 49 ° C (±12° C) water temp
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC
Base ECU	4011518

Features

Electric Fuel Gauge	N/A
Electric Start	Accessory
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard
Tachometer	Standard

DRAGON RMK

MODEL NUMBER: S07PL7JS

Engine

Engine type	Liberty
Engine displacement	700cc
Bore (in/mm)	3.19/81
Stroke (in/mm)	2.68/68
Piston to cylinder clearance (in/mm)	.0045-.0059/.115-.149
Piston ring end gap (in/mm)	.014-.020/.35-.50
Operating RPM ±200	8250
Idle RPM ±200	1700
Clutch engagement RPM ±200	3800
Exhaust valve spring	Purple

Fuel Delivery

Type	Injected
Throttle Body Manufacturer	Mikuni
Throttle Body Bore Size (in/mm)	1.81/46
Fuel Injection Type	Kokusan
Regulator Pressure (psi/Bar)	58/4
TPS Voltage at Idle	.95 ±.01v
Throttle Gap @ Idle	0
Recommended fuel octane (R+M/2)	91 Min. NonOxy

Clutching

ALTITUDE meters (feet)	DRIVE CLUTCH (P-85)		DRIVEN CLUTCH (TEAM)		
	Shift Weight	Clutch Spring	Clutch Spring	Driven Helix	Gearing
0-600 (0-2000)	10-66	Black/ Green	Black	56/42-36 LW ER	20:41-76
600-1200 (2000-4000)	10-64	Black/ Green	Black	56/42-36 LW ER	20:41-76
1200-1800 (4000-6000)	10-62	Black/ Green	Black	56/42-36 LW ER	20:41-76
1800-2400 (6000-8000)	10-60	Black/ Green	Black	56/42-36 LW ER	20:41-76
2400-3000 (8000-10000)	10-58	Black/ Green	Black	56/42-36 LW ER	20:41-76
3000-3600 (10000-12000)	10-56	Black/ Green	Black	56/42-36 LW ER	20:41-76
Drive clutch bolt torque 80 ft-lbs (108Nm)					

Belt

Belt part number	3211115
Belt width (in/cm)	1.460/3.7
Belt side angle	26°
Outside diameter (in/cm)	46.77/118.8
Clutch center distance (in/cm)	11.5/29.2

Chaincase

Center distance (in/cm)	8.373/21.27
Reverse type	PERC

Fluids and Capacities

Fuel (gal/l)	12.1/45.8
Oil (qts/l)	3/2.8
Coolant (qts/l)	6.7/6.3
Chaincase (oz/ml)	11/325.3
Brake fluid type	DOT 4

Track

Width (in/cm)	15/38
Length (in/cm)	155/393.7
Lug height (in/cm)	2.4/6.1
Manufacturer	Camoplast
Track tension sag (in/cm) with 10 lbs/ 4.54kg placed 16 in/40.6cm ahead of rear idler shaft	.375-.50/1-1.3

Front Suspension

Suspension type	IQ RMK
IFS shocks	Walker/7043233*
IFS nitrogen charge	215 psi/14.8 bar nitrogen
Spring installed length (in/cm)	N/A
Front vertical travel (in/cm)	9/22.9
Ski center distance (in/cm)	38.67/98.2
Camber (in/cm)	2.17±.31/5.5±.79
Toe (in/mm)	0-.12/0-3.0
* notes that shock is serviceable	

Rear Suspension

Suspension type	IQ RMK 155
Front track shock	Walker/7043234*
IFS nitrogen charge	215 psi/14.8 bar nitrogen
FTS spring installed length (in/cm)	N/A
Rear track shock (RTS)	Walker/7043235*
Rear travel (in/cm)	15.5/39.4
* notes that shock is serviceable	

Torsion Spring

Torsion spring PNs (LH/RH)	7041629/7041630
Torsion spring diameter (in/mm)	.359/9.12
Torsion spring tail angle	77°

Dimensions

Width (in/cm)	46.5/118
Length (in/cm)	130.5/331
Height (in/cm)	49/124
Est dry weight lb/kg	484/219.7

Electrical

Stator output	400w@4000RPM
Ignition timing	18° @ 1700 RPM (±200 RPM) & 120° F (±10° F) 49 ° C (±12° C) water temp
Spark plug gap (in/mm)	.027/.70
Spark plug	Champion RN57YCC

Features

Electric Fuel Gauge	N/A
Electric Start	Accessory
Low Oil Light	Standard
Parking Brake	Standard
Speedometer	Standard
Tachometer	Standard

NOTES

CHAPTER 2
GENERAL

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HOW TO USE THIS MANUAL

Gearing

Gearing that is called out in the clutching table is stated as TOP GEAR (total number of teeth): BOTTOM GEAR (total number of teeth) - CHAIN PITCH (total number of links)

Example 22:39-76

- Top Gear = 22 tooth
- Bottom Gear = 39 tooth
- Drive Chain = 76 pitch (links)

Production setting is designated in the shaded areas

Jetting

Jetting chart is called out in the Jetting table and is stated as MAIN JET on top and the e-clip position on the bottom.

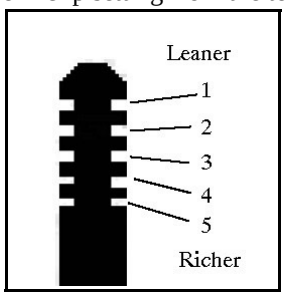
Example:

Example

260 #3

260 = Main Jet

#3 = The E-clip setting from the top down



Production setting is designated in the shaded areas. If the jetting is staggered, the main jets will be listed as PTO/MAG.

Specifications may change after the production of this manual. Any changes will be communicated by Team Tips.

Clutch Springs

Springs are designated by color. For example part number 7041781 is a Dark Blue/White spring. The color means that the main color of the spring is Dark Blue and it will have a White stripe down the center of the spring. This color designation represents the compression weight of the spring. The spring force is 120-310.

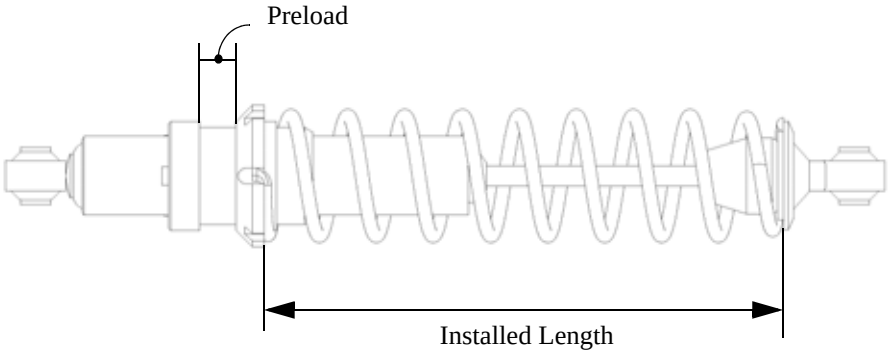
Any new springs that are released will now be all Black in color and will have the last four digits of the part number with the spring force printed on the main body of the spring. Example: Part Number 7042287 would have “2287 110/290” printed in white ink on the spring.

Suspension Spring Pre-Load/Installed Length

When installing springs on shocks the specifications will call out “Installed Length” or “Pre-Load”.

Installed Length is the length of the spring from end to end when it is ready to be installed on the snowmobile. You should adjust the spring preload ring until you reach your specified spring installed length.

Pre-Load is the amount of space that you have from the bottom of the spring preload adjuster to the top of the spring retainer.



SNOWMOBILE NUMBER DESIGNATIONS

Model Number Designation

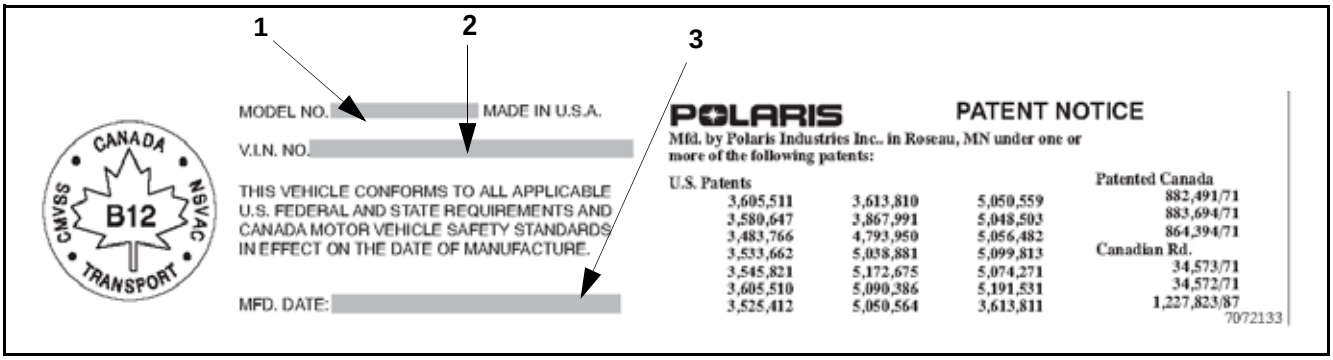
S07PP6FSA (600 HO IQ STOCK A)

IDENTIFIER	MODEL YEAR	MODEL LINE	MODEL TYPE	ENGINE MODIFIER		VIN IDENTIFIER	OPTION IDENTIFIER
1st digit	2/3rd digit	4th digit	5th digit	6th digit*	7th digit*	8th digit	9th digit**
S	06	P	S	8	D	S	A
S=Snow	07=2007 06=2006 05=2005 04=2004	M=Race IQ N=Edge P= IQ S=GenII W=Mini Indy	C=Dragon 121 D=Classic F=Classic LTD J=136 RMK K=144 RMK L=155 Assult M=155 RMK N=166 RMK P=Performance S=Switchback T=Touring U=Utility Y=Touring Limited	1A=121 F/C OHV 4 Cycle Fuji 3A=340 F/C Piston Port 4B=488 L/C Piston Port 4C=440 EV L/C Piston Port 5B=544 F/C Cylinder Reed 5C=500 EV L/C Case Reed 2 Cyl Liberty 6F=600 EV L/C Case Reed HP 2 Cyl Liberty 6H=600 EV L/C Case Reed SDI 2 Cyl Liberty 7E=750 2 Cyl FS Webber 7F=750 Turbo2 Cyl FS Webber 7H=755 EV SDI Case Reed Liberty 7J=700 EV L/C Case Reed SDI 2 Cyl Liberty 8D=866 EV SDI Case Reed Liberty		E=Europe Unit M=Military R=Rolling Chassis S=Standard Production Unit V= Validation	Option Identifier
*=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 sued in model number only. They are not used with the 17 digit VIN.							

VEHICLE IDENTIFICATION NUMBER (VIN)

Tunnel Decal

The Tunnel Decal has the Model Number (1), V.I.N. Number (2), and the Manufactured Date (3).These numbers should be referred to in any correspondence regarding warranty, service or replacement parts.The machine model and V.I.N. number identification decal is located on the right front side of the tunnel. The V.I.N (2) number is permanently stamped into the tunnel. The model number is embossed on the decal.



VIN Number Designation

World Mfg. ID			Vehicle Descriptors						Vehicle Identifiers							
			Body Style	Type	Engine Size	Engine Modifier	Series	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
S	N	1	S	B	5	B	S	0	2	2	0	0	0	0	0	0

PUBLICATION PART NUMBERS

Misc. Publications

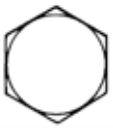
YEAR	PUBLICATION	PART NUMBER
2007	2007 Specification/Quick Reference Manual	9920653
2007	2007 Wiring Diagram Packet (all models)	9920688
2006-2007	2006-2007 FS/FST Pages	9920472
2006-2007	2006-2007 FS/FST Binder	9921004
ALL	Track Diagnosis Poster	9918459
ALL	Belt Failure Poster	9920936
2006	2006 Specification/Quick Reference Manual	9920147
2006	2006 Wiring Diagram packet (all models)	9920672
ALL	Monotube Shock Rebuilding Video	9917736
ALL	Remote Reservoir Shock Rebuilding	9917737

2007 Service Publications

2007 MODEL	MODEL NUMBER	OWNER'S MANUAL	OWNER'S MANUAL	PARTS BOOK	ASSEMBLY INSTRUCTIONS	SERVICE MANUAL
440 IQ	S07MX4CS	9920432	9920433	9920434	9919882	9920436
340 Edge LX	S07ND3AS	9920437	9920438	9920442	9916508	9920444
550 Edge LX	S07ND5BS	9920437	9920439	9920445	9916508	9920444
Trail RMK	S07NJ5B(E,S)	9920449	9920450	9920451	9919882	9920444
SuperSport	S07NP5BS	9920437	9920440	9920445	9916508	9920444
500 XCSP	S07NP5C(E,S)	9920437	9920441	9920447	9916508	9920444
Indy 340 Touring	S07NT3A(E,S)	9920449	9920453	9920454	9916508	9920444
Trail Touring Deluxe	S07NT5B(E,S)(A)	9920449	9920456	9920457	9916508	9920444
Dragon	S07PC7J(E,S)	9920648	9920460	9920461	9919882	9920463
600 CFI IQ LX	S07PD6HS	9920464	9920465	9920466	9916508	9920463
FST IQ LX	S07PD7FS	9920468	9920473	9920474	9916508	9920472
600 RMK 144	S07PK6FS	9920476	9920477	9920478	9919882	9920463
Dragon RMK	S07PL7JS	9920911	N/A	9920912	9920606	9920463
600 RMK 155	S07PM6FS(A)	9920476	9920483	9920478	9919882	9920463
600 HO IQ	S07PP6FS(A,B)	9920459	9920460	9920461	9919882	9920463
600 CFI IQ	S07PP6HS(A,B)	9920464	9920487	9920466	9919882	9920463
FST IQ	S07PP7F(E,S)	9920468	9920488	9920474	9919882	9920472
600 HO IQ Switchback F/O	S07PS6FS(A)	9920459	9920597	9920598	9916508	9920463
600 SDI IQ Switchback F/O	S07PS6HS(A)	9920464	9920495	9920496	9916508	9920463
FST IQ Switchback	S07PS7F(E,S)	9920468	9920498	9920499	9916508	9920463
600 CFI IQ Touring	S07PT6H(E,S)	9920464	9920501	9920502	9916508	9920463
FS IQ Touring	S07PT7E(E,S)	9920468	9920504	9920505	9916508	9920472
FST IQ Touring	S07PT7F(E,S)	9920468	9920507	9920508	9916508	9920472
FST IQ Cruiser	S07PY7F(E,S)	9920468	9920507	9920508	9916508	9920472
Widetrak LX	S07SU4B(E,S)	9920449	9920510	9920511	9916508	9920444
120	S07WB1AS	9920513	no suppl.	9920515	9916891	9920517

GENERAL REFERENCE

Standard Bolt Torque Specification



Grade 2



Grade 5



Grade 8

Bolt Size	Threads/In	Grade 2 Ft-Lb(N-M)	Grade 5 Ft-Lb(N-M)	Grade 8 Ft-Lb(N-M)
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)
Ft-Lb X 1.356 = N-M N-M X.7376 = Ft-Lb				

2 Stroke Gasoline / Oil Pre Mix

GALLONS OF FUEL	OZ OF OIL NEEDED TO ACHIEVE A **20:1** RATIO	OZ OF OIL NEEDED TO ACHIEVE A **32:1** RATIO
1	6	4
2	13	8
3	19	12
4	26	16
5	32	20
6	38	24

To figure out the correct fuel to oil ratio per gallon, you will need to use different formulas for the ratio that you are looking for. Example of a fuel/oil ratio of 20:1 is figured out by taking the gallons of the fuel mixing container (1 gallon) and converting it to ounces (128 oz.) divided by the ratio that you are looking for (20), this will give you the amount of oil that you need (6.4 oz.) to add to the fuel in the mixing container.

1 gallon has 128oz. / 20 = 6.4 oz. of oil needed to mix to each 1 gallon of gasoline. For a 5 gallon mixture, you would need add 32 oz. of oil to the gasoline.

Gasoline Volatility

Maximum Reid Vapor		Ambient Air Temp Range	
CLASS	PRESSURE	LOW	HIGH
A	7.0 psi (0.5 bar)	60°F (16°C)	110°F+ (43°C+)
B	9.0 psi (0.6 bar)	50°F (10°C)	110°F (43°C)
C	10.5psi (0.7 bar)	40°F (4°C)	97°F (36°C)
D	12.0psi (0.8 bar)	30°F (-1°C)	85°F (29°C)
E	13.5psi (0.9 bar)	20°F (-7°C)	69°F (21°C)
Add 2.45°F for each 1000 ft (305m) above sea level			

One of the misunderstood properties of gasoline is its volatility, or ability to vaporize at different ambient temperatures and altitudes during the year.

When gasoline is blended, it is given a Reid Vapor Pressure (RVP) number which reflects its ability to vaporize or mix with air at a given temperature range. Gasoline vapor pressure is measured by putting a sample of fuel inside a closed container and applying a specified amount of heat to the container for a certain amount of time. RVP will vary from about 7.0 PSI during the summer to approximately 13.5 PSI during the colder months. Service stations selling a large volume of fuel will normally have the correct blend to work well at all times throughout the year in their local area.

When the weather is very cold, gasoline must be able to vaporize very quickly in order for an engine to start and warm up properly. If summer blend fuel is being used in the winter, little or no vaporization will occur. Droplets will form causing flooding and very hard starting.

If winter blend fuel is being used during the summer months, it may cause vapor lock (boiling fuel) inside the fuel lines, fuel pump, or carburetor. This will cause warm engine drive ability problems and hard starting when warm.

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	4.6mm	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 Equivalent	Nearest Fraction
3x.50	#39	0.0995	3/32
3x.60	3/32	0.0937	3/32
4x.70	#30	0.1285	1/8
4x.75	1/8	0.125	1/8
5x.80	#19	0.166	11/64
5x.90	#20	0.161	5/32
6x1.00	#9	0.196	13/64
7x1.00	16/64	0.234	15/64
8x1.00	J	0.277	9/32
8x1.25	17/64	0.265	17/64
9x1.00	5/16	0.3125	5/16
9x1.25	5/16	0.3125	5/16
10x1.25	11/32	0.3437	11/32
10x1.50	R	0.339	11/32
11x1.50	3/8	0.375	3/8
12x1.50	13/32	0.406	13/32
12x1.75	13/32	0.406	13/32

Decimal Equivalents

1/64	.0156	
1/32	.0312	1 mm= .0394"
3/64	.0469	
1/16	.0625	
5/64	.0781	2 mm = .0787"
3/32	.0938	
7/64	.1094	3 mm =.1181"
1/8	.1250	
9/64	.1406	
5/32	.1563	4 mm = .1575"
11/64	.1719	
3/16	.1875	5mm= .1969"
13/64	.2031	
7/32	.2188	
15/64	.2344	6 mm = .2362"
1/4	.25	
17/64	.2656	7 mm = .2756"
9/32	.2813	
19/64	.2969	
5/16	.3125	8mm= .3150"
21/64	.3281	
11/32	.3438	9 mm = .3543"
23/64	.3594	
3/8	.375	
25/64	.3906	10 mm = .3937"
13/32	.4063	
27/64	.4219	11 mm =.4331"
7/16	.4375	
29/64	.4531	
15/32	.4688	12 mm = .4724"
31/64	.4844	
1/2	.5	13mm = .5118"
33/64	.5156	
17/32	.5313	
35/64	.5469	14 mm = .5512"
9/16	.5625	
37/64	.5781	15 mm = .5906"
19/32	.5938	
39/64	.6094	
5/8	.625	16mm=. 6299"
41/64	.6406	
21/32	.6563	17 mm =.6693"
43/64	.6719	
11/16	.6875	
45/64	.7031	18 mm = .7087"
23/32	.7188	
47/64	.7344	19 mm = .7480"
3/4	.75	
49/64	.7656	
25/32	.7813	20 mm = .7874"
51/64	.7969	
13/16	.8125	21 mm =.8268"
53/64	.8281	
27/32	.8438	
55/64	.8594	22 mm = .8661"
7/8	.875	
57/64	.8906	23 mm = .9055"
29/32	.9063	
59/64	.9219	
15/16	.9375	24 mm = .9449"
61/64	.9531	
31/32	.9688	25 mm = .9843"
63/64	.9844	
1	1.0	

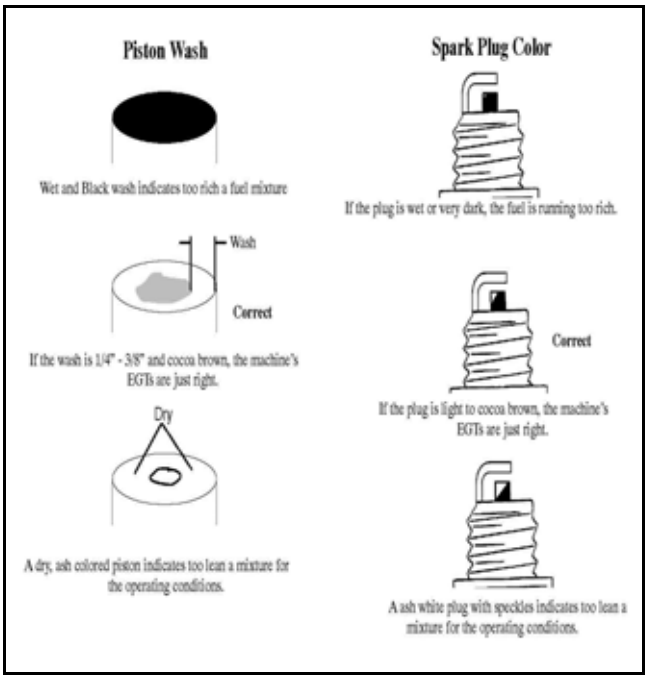
Measurement Conversion Chart

UNIT OF MEASURE	MULTIPLIED BY	CONVERTS TO
ft-lb	x 12	= in-lb
in-lb	x.0833	= ft-lb
ft-lb	x 1.356	= N-m
in-lb	x.0115	= kg-m
N-m	x.7376	= ft-lb
kg-m	x 7.233	= ft-lb
kg-m	x 86.796	= in-lb
kg-m	x 10	= N-m
in	x 25.4	= mm
mm	x.03937	= in
in	x 2.54	= cm
mile	x 1.6	= km
km	x.6214	= mile
Ounces (oz)	x 28.35	= grams (g)
grams (g)	x.035	= Ounces (oz)
cc's	x.03381	= Fluid Ounces (oz)
lbs	x.454	= kg
kg	x 2.2046	= lbs
Cubic Inches	x 16.387	= Cubic Centermeters
Cubic Centimeters	x.061	= Cubic Inches
Imperial pints	x.568	= liters (l)
liters (l)	x 1.76	= Imperial pints
Imperial quarts	x 1.137	= liters (l)
liters (l)	x.88	= Imperial quarts
Imperial quarts	x 1.201	= US quarts
US quarts	x.833	= Imperial quarts
US quarts	x.946	= liters
liters	x 1.057	= US quarts
US gallon	x 3.785	= liter
liter	x.264	= US gallon
Pounds force per square inch (psi)	x 6.895	= Kilo pascals (kPa)
Kilo pascals (kPa)	x.145	= Pounds force per square inch (psi)

Piston Wash / Spark Plug Reading

Changing temperature, barometer, altitude, and fuel supply are just a few of the factors that can affect the day to day performance of your engine. That is why using Exhaust Gas Temperatures (EGT) are important for maintaining optimum performance. There are two methods for helping you determine what the EGTs are for your machine. Piston wash and the coloring of your spark plug.The piston wash is by far the most valuable tool in concluding EGTs, with the spark plug color running a distant second. Use the illustrations below to help you establish the EGTs for your machine.

Once the proper jetting is established, you can reference the EGT gauge for your baseline numbers. Then, if there is a rise or fall of 25 degrees, you must jet accordingly to return your EGTs to the baseline numbers.



Glossary Of Terms

ABDC: After bottom dead center.
ACV: Alternating current voltage.
Alternator: Electrical generator producing voltage alternating current.
ATDC: After top dead center.
BBDC: Before bottom dead center.
BDC: Bottom dead center.
BTDC: Before top dead center.
CC: Cubic centimeters.
Center Distance: Distance between center of crankshaft and center of driven clutch shaft.
Chain Pitch: Distance between chain link pins (No. 35 = 3/8" or 1 cm). Polaris measures chain length in number of pitches.
CI: Cubic inches.
Clutch Buttons: Plastic bushings which aid rotation of the movable sheave in the drive and driven clutch.
Clutch Offset: Drive and driven clutches are offset so that drive belt will stay nearly straight as it moves along the clutch face.
Clutch Weights: Three levers in the drive clutch which relative to their weight, profile and engine RPM cause the drive clutch to close and grip the drive belt.
Crankshaft Run-Out: Run-out or “bend” of crankshaft measured with a dial indicator while crankshaft is supported between centers on V blocks or resting in crankcase. Measure at various points especially at PTO.
CVT: Continuously Variable Transmission (Drive Clutch System)
DCV: Direct current voltage.
Dial Bore Gauge: A cylinder measuring instrument which uses a dial indicator. Good for showing taper and out-of-round in the cylinder bore.
Electrical Open: Open circuit. An electrical circuit which isn't complete.
Electrical Short: Short circuit. An electrical circuit which is completed before the current reaches the intended load. (i.e. a bare wire touching the chassis).
End Seals: Rubber seals at each end of the crankshaft.
Engagement RPM: Engine RPM at which the drive clutch engages to make contact with the drive belt.
ft.: Foot or feet.
ft-lb: (foot pounds) A force of one pound at the end of a lever one foot in length, applied in a rotational direction.
g: Gram. Unit of weight in the metric system.
gal.: Gallon.
ID: Inside diameter.
in.: Inch/inches.
in-lb: (inch pounds) A force of one pound at the end of a lever one foot in length, applied in a rotational direction. 12 in. lbs. = 1 ft. lb.
kg/cm^2: Kilograms per square centimeter.
kg-m: Kilogram meters.
Kilogram/meter: A force of one kilogram at the end of a lever one meter in length, applied in a rotational direction.
l or ltr: Liter.
lbs/in^2: Pounds per square inch.
Left or Right Side: Always referred to based on normal operating position of the driver.
m: Meter/meters.
Mag: Magneto.
Magnetic Induction: As a conductor (coil) is moved through a magnetic field, a voltage will be generated in the windings. Mechanical energy is converted to electrical energy in the stator.
mi.: Mile/miles.
mm: Millimeter. Unit of length in the metric system. 1 mm = approximately .040".
N-m: Newton meters.
OD: Outside diameter.
Ohm: The unit of electrical resistance opposing current flow.
oz.: Ounce/ounces.
Piston Clearance: Total distance between piston and cylinder wall.
psi.: Pounds per square inch.
PTO: Power take off.
qt.: Quart/quarts.
Regulator: Voltage regulator. Regulates battery charging system output at approx. 14.5 DCV as engine RPM increases.
Reservoir Tank: The fill tank in the liquid cooling system.
Resistance: In the mechanical sense, friction or load. In the electrical sense, ohms, resulting in energy conversion to heat.
RPM: Revolutions per minute.
Seized Piston: Galling of the sides of a piston. Usually there is a transfer of aluminum from the piston onto the cylinder wall.
Possible causes: 1) improper lubrication; 2) excessive temperatures; 3) insufficient piston clearance; 4) stuck piston rings.
Stator Plate: The plate mounted under the flywheel supporting the battery charging coils.
TDC: Top dead center. Piston's most outward travel from crankshaft.
Volt: The unit of measure for electrical pressure of electromotive force. Measured by a voltmeter in parallel with the circuit.
Watt: Unit of electrical power. Watts = amperes x volts.
WOT: Wide open throttle.

SPECIAL TOOLS

Special Tools

PS-47152 $4.00
Fuel Line Disconnect Tool
This is a quick disconnect tool to unlock the couplers on the Polaris high pressure fuel lines.





2870975 **MITY-VAC PRESSURE TEST TOOL**

Source of vacuum and pressure. For carburetor needle & seat testing, brake bleeding and cooling system testing.



2201519 **THROTTLE POSITION SENSOR TESTER KIT**

To test T.P.S. on all 2-stroke Snow models with T.P.S.



PV-43506 **FUEL PRESSURE GAUGE**

Used to measure fuel pressure for fuel injection diagnostic work.



2871846
2871847

WATER PUMP SEAL INSTALLATION TOOLS

Used to install water pump mechanical seal (PN 3610050) on '97 and '98 600 & 700 cc domestic twin cylinder engines and '97 440 XCR.

Both required.
2871846 Guide
2871847 Driver



2870303 **AMMCO HONE KIT**

Rigid hone to correct tapered and out of round cylinders. Range: 47.6 mm – 69.8 mm (1⅞" – 2¾"). Contains 60 and 220 grit stones, driveshank with depth stop and metal storage box. Oversize stone kits increase range to 92 mm (3⅝").

Replacement Stone Kits
2870304 47.6 – 69.8 mm, 60 grit
2870305 47.6 – 69.8 mm, 220 grit
2870306 69.8 – 92 mm, 60 grit
2870307 69.8 – 92 mm, 220 grit
2871536 47.6 – 69.8 mm for Ni-Ca-Si deglazing



2870588 **HONING OIL**

12 oz can with dispensing tip. Promotes better finishes, faster cutting and longer stone life.



2870386 **PISTON PIN PULLER**

Removes 18 mm piston pins from many Polaris pistons. Required for many Polaris puller attachments.

Note: Some engines require adapters.



2871342 **PISTON PIN PULLER ADAPTER**

For EC 58 snowmobile engines. Needed for proper positioning of piston pin puller on piston to prevent damage to piston. Requires use of 2870086 piston pin puller.



2871445 **PISTON PIN PULLER ADAPTER**

For domestic Liberty™ engines. Needed to position piston pin puller correctly on to piston to prevent damage to piston. Piston Pin puller 2870386 needed to use this tool.



2870390 **PISTON SUPPORT BLOCK**

Safely supports piston while disassembling or assembling engine top end.



2870569 **CRANKSHAFT TRUING STAND**

For holding crankshaft while checking runout for all Polaris engines.



2870773 **C-CLIP INSTALLATION TOOL**

For installing piston pin c-clips on most Polaris engines.



2871043 **HEAVY DUTY FLYWHEEL PULLER – 6 BOLT**

Removes all current Polaris flywheels.

Parts also sold separately
5130910 Heavy Duty F.W.P. Plate
5020648 Center bolt for puller
2872112 Center bolt for puller (length 2")
5020650 Flywheel puller cap. 1992 PWC only
3080706 6 mm bolts (4)
221537 8 mm bolt (1)



2871989 **ENGINE MOUNT SOCKETS**

For removing and installing all snowmobile engines that have drive tabs. Low profile small diameter.

PS-45384 For removing tall rubber mounts that have drive tabs. Large diameter.



2870402

CLUTCH PIN INSTALLATION TOOL

For installing cold rolled pin for shift weight pin on early clutches.



2870587

CLUTCH PIN PUNCH

To remove and replace spider weight pins.



2870576

TAPERED REAMER FOR DRIVE CLUTCH BORE

To ensure proper fit between drive clutch bore and engine crankshaft.



2870910-A

ROLLER PIN TOOL

This tool has been updated so it can be used with all Polaris aluminum Drive Clutches to service Drive Rollers and their bushings.



2870914

P-90 SNOWMOBILE CLUTCH OFFSET ALIGNMENT TOOL

Establishes correct offset and alignment on P-90 clutches.



2870985

DRIVE CLUTCH BUTTON REMOVAL TOOL

Removes tight spider buttons.

2871025

CLUTCH BUSHING REPLACEMENT TOOL KIT

Needed to remove and replace clutch drive and drive bushings on all Polaris clutches. Requires pinion pin puller 2870994 (sold separately).



Parts also separately:
9020627 P-85 clutch bushing installation tool
9020628 P-90 clutch bushing installation tool
9020629 Drive cover bushing remover and installer
9020630 P-85 driver bushing installation tool
9020631 P-90 driven clutch bushing removal tool
9020632 Main puller adapter
9020633 #2 puller adapter
9018279 Adapter reducer
5130062 P-85 driven sheave removal tool
5222768 P-85 driven sheave removal bridge



2871173

DRIVE CLUTCH COMPRESSION TOOL

Compresses drive clutch while still on engine.



2871358

DRIVE CLUTCH HOLDING FIXTURE

Holds all Polaris aluminum drive clutches.



PS-46998

P-85 CLUTCH ALIGNMENT TOOL

This clutch alignment tool provides an accurate method to check ¼" clutch offset and alignment by referencing both stationary sheaves.



PU-45779

CLUTCH PILOT TOOL

Used with the 2871358 to compress the clutch.



2872010

WATER PUMP SEAL INSTALLATION TOOL

For installing water pump mechanical seal to depth of 8.4 mm on 1968 – Present small block domestic twins (440, 500 and 600 EV).



2872389

WATER PUMP SEAL INSTALLATION TOOL

For installing water pump mechanical seal to depth of 8.9 mm on 1999 – Present Big Block domestic twins (600,700 & 800).



2872401

20 MM C-CLIP TOOL

To install C-clip on small bore domestic twin engines.



2872622A

22 MM C-CLIP TOOL

To install C-clip on Big Block domestic twin engines and 1200 PWC.



5131135

EC68PL & EC59PL WATER PUMP INSTALLATION TOOL

For installing water pump seal on EC68PL & EC59PL engines. Does not include bolt, nut or washers.



PA-44995

WATER PUMP MECHANICAL SEAL INSTALLER

Used to install and set the mechanical seal properly into the mag end gear case.

Application: Domestic ATV 4-stroke and Frontier



PA-45401

WATER PUMP SEAL SAVER

Used to protect the water pump seal while installing the mag end gear cover.

Application: Domestic ATV 4-stroke and Frontier



PA-45483

MAIN SEAL INSTALLER

Used to install the crankshaft mag end seal into the gear cover.

Application: Domestic ATV 4-stroke and Frontier



PA-45658

MAIN CRANKSHAFT SEAL SAVER

Used to set the seal lips in the correct position and protect the seal when the mag end gear cover is installed.

Application: Domestic ATV 4-stroke and Frontier



PA-46502

VALVE SPRING COMPRESSOR

Used to compress the valve springs on all Polaris FUJI 4-stroke engines.



PU-45255

PISTON PIN PULLER

Requires Adapters for 800 Series Snow, 1200 Series Watercraft and 500 Series ATV applications.



PU-45248

PISTON PIN PULLER ADAPTER

Adapter for 800 Series Snow, 1200 Series Watercraft and 500 Series ATV applications. Must be used with PU-45255.



2870338

DRIVE CLUTCH SPIDER NUT SOCKET

For removing and installing spider jam nut on P-85 clutches.



2870341-A

DRIVE CLUTCH SPIDER REMOVAL AND INSTALLATION TOOL

For removing and re-torquing clutch spider. Fits all aluminum drive clutch spiders.



2870401

PIN CENTERING TOOL

To center spider pin for early model Snow Drive Clutches.



2871855 **DRIVE CLUTCH PULLER**

For domestic engines 1999 and earlier (14 mm thread size). For 500, 600, 700 and 800 cc domestic twins (Replacement T-handle 5020326).



2872084 **DRIVE CLUTCH PULLER**

ii-16x1½". (1999-2001) 440 Fan and 550 Fuji/Robin air cooled engines and drive clutch puller (Replacement T-Handle 5020326).



2872085 **DRIVE CLUTCH PULLER**

ii-16x14 mm. 1999-2001 700/800 XCR Fuji/Robin 3 cylinder engine drive clutch puller (Replacement T-Handle 5020326). 2000-2001 domestic engines.



8700220 **CLUTCH COMPRESSION TOOL**

To compress drive clutch for assembly and disassembly. Also helps in disassembly and assembly of driven clutch.



PS-45909 **CLUTCH COMPRESSION EXTENSIONS**

Used with 8700220 to compress the Team clutches.



8700221 **SPIDER ASSEMBLY TOOL**

Spring loaded mandrel to line up spider, roller and spacer washers. Mandrel retracts into tool when roller pin is installed.



2870623 **SHOCK ABSORBER SPRING COMPRESSION TOOL**

Compresses shock springs for removal and installation.



2870803 **SHOCK SPRING PRE-LOAD ADJUSTMENT TOOL**

Adjusts spring compression



2871071 **SHOCK BODY HOLDING TOOL**

Safely holds gas shock body during rebuilding. Requires shop vice.



2871352 **SHOCK ROD HOLDING TOOL – ¼" ROD**
2872429 **SHOCK ROD HOLDING – ½" ROD**

Safely secures shock damper rod during rebuilding without damage to rod. Use with shop vise (not included).



2871095 **REPLACEMENT TOOL KIT SPANNER WRENCH**

For IFS shock spring pre-load cam adjuster.



2871232 **GAS SHOCK SPANNER**

To adjust gas shocks that have threaded spring pre-load adjusters.



2871351 **GAS SHOCK IFP DEPTH TOOL**

For removing Internal Floating Piston and setting proper IFP depth for reassembly.



2871537 **TRAVEL LOCATION BAR KIT**

To set camber and toe-in on CRC front ends.

Parts also sold separately:
S211822 Travel location bar, 1997 CRC, 11.63"
S211713 Travel location bar, 15.28"
S211714 Travel location bar, 13.78"
102050 Travel location fasteners
RS-3480-1250 Travel location Hex lock nut
S333548 Travel location CRC ski alignment bar, 46"



PA-46355 **ACE SUSPENSION DIAGNOSTIC HARNESS**

This interface harness is used to perform diagnostic procedures on the M-10 ACE-equipped snowmobiles. Also used to power up the ECU on 2005 800/900 ICE for digital wrench.



PS-44925 **SHOCK TUBE PULLER**

Required to remove inner piston sleeve on welded dome PPS Shocks.



PS-45152 **THIN OPEN END WRENCH**

Needed to hold bushing while removing rear torque arm bolts from tunnel on Edge models.



PS-45259 **GAS FILL TOOL**

Gauge and needles to properly recharge Ryde FX™ Shocks. Comes with 5 needles. Replacement needles PS-45259-1 (20 pack). Does not include regulator or nitrogen tank.



PS-45260 **LOWER RETAINER SPANNER WRENCH**

To adjust lower retainer on Ryde FX™ Shocks.



PS-45261 **IFP POSITIONING/EXTRACTION TOOL**

For Ryde FX™ Shocks.



PS-45262 **CYLINDER HEAD WRENCH**

Spanner wrench for cylinder head on Ryde FX™ Shocks.



PS-45263 **WEAR BAND TOOL**

To properly install wear band on Ryde FX™ Shocks.



PS-45280 **SHOCK COLLAR TOOL**

For removal of shock collar on Ryde FX™ Shocks.



PS-45629 **SHOCK BODY HOLDER**
PS-45281 **SHOCK RESERVOIR HOLDER**

To hold Ryde FX™ Shocks in vise for service.



PS-45678 **SHOCK SHAFT SEAL PROTECTOR**

This tool is used to protect the seal during installation on .51 diameter shock shaft.



PS-45683 **SHOCK SPRING COMPRESSOR**

A new shock spring compressor has been created to com press and aid in the removal of the coil springs from the M-10 and many other shocks.



2871337 — **CAMOPLAST TRACK CLIP REMOVAL TOOL**

Removes track guides and clips from Camoplast tracks.



2871296 — **JACKSHAFT INSTALLATION TOOL**

For larger diameter shafts on XTRA suspension models (15 spline jackshaft). Prevents seal damage.



2871188 — **TUNNEL RIVET INSTALLATION TOOL**

For installing buck rivets in snowmobile tunnels.



2871535 — **JACKSHAFT ALIGNMENT TOOL**

For larger diameter shafts on XTRA suspension models. Ensures proper chaincase jackshaft bearing alignment.



PS-45484 — **RIVET PUNCH**

Used to remove the self-piercing rivets used in 2000 and newer Snowmobile bulkheads and tunnels.



PU-45485 — **EXHUAST VALVE SPRING TOOL**

Used to remove the exhaust springs.



PS-45988 — **T-HANDLE TOOL**

Used to remove and install the floating piston of the Walker Evans shock. The tool can also be used to set the floating piston height.

Application: Walker Evans Shocks



PU-45779 — **CLUTCH PILOT TOOL**

Used with the 2871368 Clutch Holding Fixture to guide the Driven Clutch Helix into place over the stationary shaft on assembly.

Application: P-85 Drive Clutch only



2201519 — **THROTTLE POSITION SENSOR TESTER KIT**

To test T.P.S. on all 2-stroke Snow models with T.P.S.



2870509 — **UNI-SYN GAUGE**

Visual method of synchronizing carburetors on multi-carbureted engine.



2871174 — **GREASE GUN ADAPTER**

For lubricating some driveshaft bearings.



2872126 — **FLOAT HEIGHT GAUGE, KEIHIN**

For setting float heights at 16 mm on all Keihin PWK 39 mm carburetors. Determines if floats are parallel to each other.



8717024 — **TAMPER RESISTANT TORX BIT - T20**

To remove Torx screws on some Mikuni & Keihin carburetors and T.P.S.



PU-47063 — **DIGITAL WRENCH**

This diagnostic kit assists the technicians with powerful computer diagnostic capabilities. An all new "guided diagnostics" feature offers step-by-step diagnosis and repair, wire diagrams, photos and more. The kit contains the EFI diagnostic software CD, PU-47151 Interface Cable and instruction manual.



PU-47151 — **REPLACEMENT INTERFACE CABLE**

This is the primary interface cable for the Digital Wrench.

CHAPTER 3
MAINTENANCE

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MAINTENANCE PROGRAM

Polaris Recommended Program

To ensure many trouble-free miles of snowmobiling enjoyment, follow recommended regular maintenance and service checks outlined in this manual. The recommended maintenance schedule on your snowmobile calls for service and maintenance inspections at 150 miles (240 km), 1000 miles (1600 km), and 2000 miles (3200 km). These inspections should be performed by a qualified service technician. For continued optimum performance and component life, continue maintenance checks at 1000 mile (1600 km) intervals. All necessary replacement parts and labor incurred, with the exception of authorized warranty repairs, become the responsibility of the registered owner. If, during the course of the warranty period, part failures occur as a result of owner neglect in performing recommended regular maintenance, the cost of repairs are the responsibility of the owner.

Personal safety is critical when attempting to service or adjust your snowmobile. If you're not familiar with safe service or adjustment procedures and the use of tools, or if you don't feel comfortable performing these tasks yourself, contact an authorized Polaris dealer for service.

The following chart is a guide based on average riding conditions. You may need to increase frequency based on riding conditions. When inspection reveals the need for replacement parts, always use genuine Polaris parts, available from your Polaris dealer.

ITEM	PRE-RIDE	FREQUENCY MILES (KM)				PRE-SEASON
		150 (240)	500 (240)	1000 (1600)	2000 (3200)	
CLUTCH						
Clutch Alignment Offset (without belt)			I	I	I	
Drive Belt Condition	I		I	I	I	I
Clutches (disassemble)			C	C	C	
Belt Tension			I	I	I	I
Clutch Sheaves			I	I	I	I
ENGINE/COOLING						
Engine Mounts			I	I	I	I
Heat Exchangers		I	I	I	I	I
Recoil Rope	I		I	I	I	I
Engine Torque Stop			I	I	I	I
Cylinder Head Bolts			I	I	I	
Cylinder Base Nuts		I	I	I	I	
Ignition Timing BTDC			I	I	I	
VES System			C	C	C	I
Coolant Level	I		I	I	R	I
Coolant Hose			I	I	I	I
Coolant Circulation			I	I	I	
Coolant Leaks			I	I	I	I
Spark Plug Condition		I	I	I	R	I
Exhaust Pipe					I	I

I:INSPECT (CLEAN, ADJUST, TIGHTEN, LUBRICATE, REPLACE IF NECESSARY) **C:**CLEAN **R:**REPLACE **L:**LUBRICATE

ITEM	PRE-RIDE	FREQUENCY MILES (KM)				PRE-SEASON
		150 (240)	500 (240)	1000 (1600)	2000 (3200)	
Exhaust Retaining Springs			I	I	I	I
BRAKES						
Hose Routing			I	I	I	I
Hose Condition			I	I	I	I
Fluid Leaks			I	I	I	I
Brake Pads			I	I	I	I
Brake Disc			I	I	I	I
Parking Brakes	I		I	I	I	I
Brake System						I
Brake Fluid					R	
FUEL MANAGEMENT						
Pilot Air Screws			I	I	I	
Carburetor (synchronize)			I	I	I	
Idle RPM			I	I	I	
Throttle Lever		I	I	I	I	I
Oil Pump Lever (synchronize)			I	I	I	
Throttle Cable			L	L	L	
Choke Cable			L	L	L	
Choke			I	I	I	
Vent Lines			I	I	I	I
Throttle Position Sensor			I	I	I	
Fuel Lines		I	I	I	I	I
Fuel Filter (Carb)					R	
Fuel Filter (CFI)				R	R	
Oil Filter				R	R	
Oil Lines				I	I	I
Air Box		I	I	I	I	I
Drain and Water Traps			I	I	I	
ELECTRICAL						
Auxiliary Shut-Off Switch	I	I	I	I	I	I
Throttle Safety Switch	I	I	I	I	I	I
Ignition Switch	I	I	I	I	I	I
Taillight	I	I	I	I	I	I
Brakelight	I	I	I	I	I	I
Headlight	I	I	I	I	I	I
Tether Switch and Strap	I	I	I	I	I	I
CHASSIS						
Ski Toe Alignment			I	I	I	

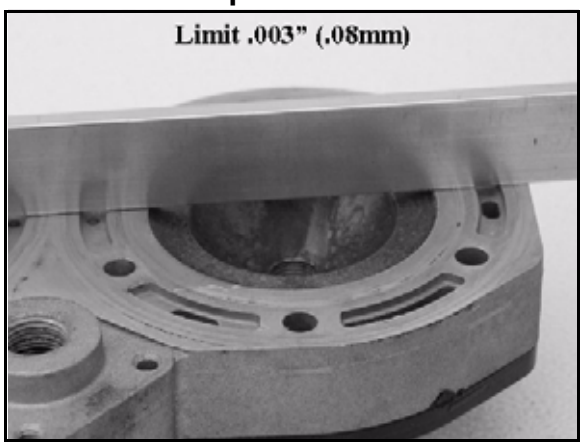
I:INSPECT (CLEAN, ADJUST, TIGHTEN, LUBRICATE, REPLACE IF NECESSARY) **C:**CLEAN **R:**REPLACE **L:**LUBRICATE

ITEM	PRE-RIDE	FREQUENCY MILES (KM)				PRE-SEASON
		150 (240)	500 (240)	1000 (1600)	2000 (3200)	
Suspension Mounting Bolts	I	I	I	I	I	I
Steering Fasteners		I	I	I	I	C
Rear Suspension Fasteners		I	I	I	I	I
Suspension Shock Oil			I	I	I	I
Cooling Fins and Shroud			I	I	I	I
Drive Shaft Bearing			L	L	L	I
Jackshaft Bearings			L	L	L	I
Skags (Wear Bars)	I	I	I	I	I	I
Ski Saddle/ Spindle Bolts	I	I	I	I	I	I
Drive Chain Tension		I	I	I	I	I
Hood Straps	I	I	I	I	I	I
Seat Latches	I					
Rear Wheel Idler Bolts	I	I	I	I	I	I
Idler Bolt Jam Nut		I	I	I	I	I
Rear Suspension Pivot Shafts			L	L		L
Handle Bar U-Joint			L	L		L
Camber Alignment			I	I	I	
Handlebar Centering						I
Track Alignment	I	I	I	I	I	I
Track Tension		I	I	I	I	I
Rail Slide Condition	I					I
Chaincase Oil	I	I	I	I	R	I
Injection Oil Level	I					

I:INSPECT (CLEAN, ADJUST, TIGHTEN, LUBRICATE, REPLACE IF NECESSARY) **C:**CLEAN **R:**REPLACE **L:**LUBRICATE

INSPECTONS

Cylinder Head Inspection



Inspect each piston dome area of the cylinder head for warping by placing a straight edge across the dome area.

With a feeler gauge measure any gap under the straight edge.

Replace cylinder head if measurement exceeds the service limit of .003" (.08mm).

NOTE: Cylinder head warp service limit is: .003"(.08mm).

Cylinder Measurement

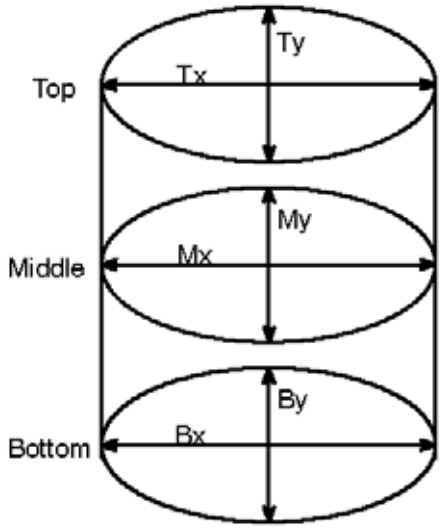
Inspect each cylinder for wear, scratches, or damage. If no damage is evident, measure the cylinder for taper and out of round with a telescoping gauge or a dial bore gauge. Measure the bore .50" from the top of the cylinder; in line with the piston pin and 90° to the pin to determine if the bore is out of round. Repeat the measurements at the middle of the cylinder and the bottom of the cylinder to determine taper or out of round at the bottom. Use the chart below and record all measurements.

Cylinder Measurement Worksheet

TOP	
Tx	Ty
MIDDLE	
Mx	My
BOTTOM	
Bx	By
Out of round = Tx - Ty and By - Bx	

Cylinder Measurement Worksheet

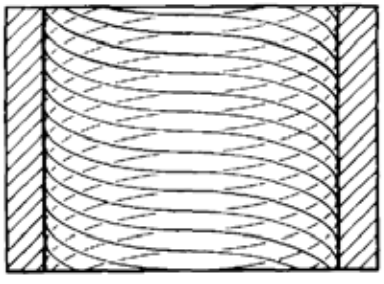
Taper limit = Ty - By and Tx - Bx
Cylinder taper limit is .002"(.051mm) Max Cylinder out of round limit is .002"(.051mm)



Cylinder Honing

The cylinder bore must be de-glazed whenever new piston rings are installed. A light honing with fine stones removes only a very small amount of material. A proper crosshatch pattern is important to provide a surface that will hold oil, and allow the rings to seat properly. If the crosshatch is too steep, oil retention will be reduced. A crosshatch angle which is too shallow will cause ring vibration, poor sealing, and overheating of the rings due to blow-by and reduced contact with the cylinder wall. Service life of the pistons and rings will be greatly reduced.

NOTE: A Nikasil cylinder can be lightly honed with a soft stone hone but an not be oversized.



EXAMPLE OF A CROSS HATCH PATTERN

Honing Procedure

1. Wash the cylinder with cleaning solvent.
2. Clamp the cylinder in a soft jawed vise by the cylinder studs.
3. Place hone in cylinder and tighten stone adjusting knob until stone contacts the cylinder walls (DO NOT OVERTIGHTEN). Cylinders may be wet or dry honed depending on the hone manufacturer's recommendations. Wet honing removes more material faster and leaves a more distinct pattern in the bore. Using a .50" (13 mm) drill motor rotating at a speed of 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 to prevent edge loading and always bring the stone approximately 2" (1.3 cm) beyond the bore at the end of each stroke.
4. Release the hone at regular intervals to inspect bore size and finish.

Honing To Over Size (340/500 Fuji Engines Only)

If cylinder wear or damage is excessive, it will be necessary to oversize the cylinder using a new oversize 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.

For oversize honing always wet hone using honing oil and a coarse roughing stone. Measure the new piston at room temperature (see piston measurement) and rough hone to the size of the piston or slightly larger. Always leave .002" - .003" (.05 - .07 mm) for finish honing. Complete the sizing with fine grit stones to provide the proper cross-hatch finish and required piston clearance.

Inspect cylinder for taper and out-of-round. Taper or out-of-round on the finished bore should not exceed .0004" (.002mm).

NOTE: Portable rigid hones are not recommended for over sizing cylinders, cylinder boring, and finish honing. The use of an arbor type honing machine is recommended. Always check piston to cylinder clearance and piston ring installed gap after boring/ honing is complete.

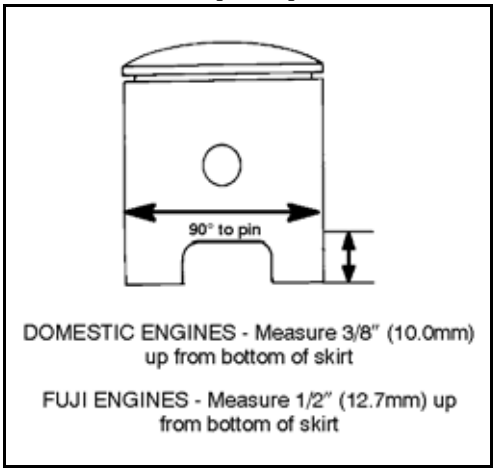
Cleaning The Cylinder After Honing

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 (transfer port area). Use electrical contact cleaner if necessary to clean these areas. Rinse thoroughly, dry with compressed air, and oil the bore immediately with Polaris Premium 2 Cycle Lubricant.

NOTE: Always check piston to cylinder clearance and piston ring installed gap after honing or boring is complete.

Piston Inspection

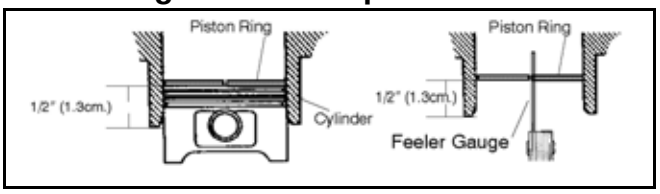
Check piston for scoring or cracks in piston crown or pin area. Excessive carbon buildup below the ring lands is an indication of piston, ring or cylinder wear. For Liberty™ engines, measure piston outside diameter at a point .375" (10mm) up from the bottom of the skirt at a 90° angle to the direction of the piston pin. For Fuji engines, measure piston outside diameter at a point that is .50" (12.7mm) up form the bottom of the skirt at a 90° angle to the direction of the piston pin.



NOTE: The piston is measured at this point to provide an accurate piston to cylinder measurements.

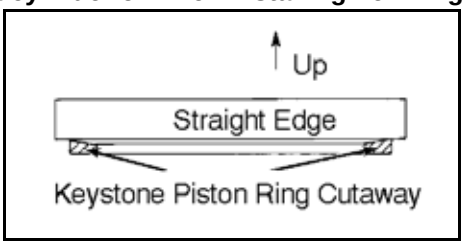
Subtract this measurement from the minimum cylinder measurement (90° to the pin) recorded previously when you recorded the cylinder measurements. If clearance exceeds the service limit, the cylinder should be re-bored and new pistons and rings installed. Refer to piston to cylinder clearance limits in the General Information section listed per model.

Piston Ring Installed Gap



Position the ring .50" (1.3 cm) from the top of the cylinder using the piston to push it squarely into place. Measure installed gap with a feeler gauge at both the top and bottom of the cylinder.

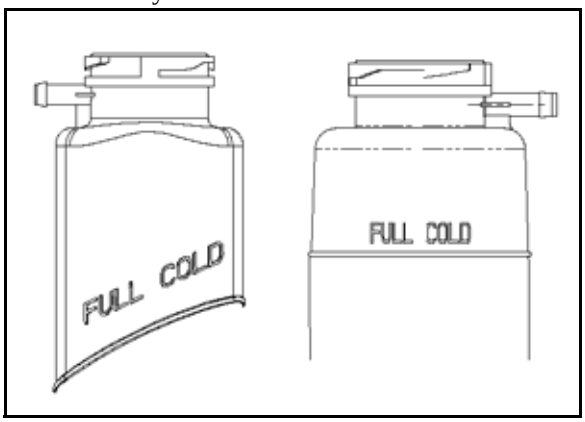
NOTE: A difference in end gap indicates cylinder taper. The cylinder should be measured for excessive taper and out of round. Replace rings if the installed end gap exceeds the service limit. Always check piston ring installed gap after re-boring a cylinder or when installing new rings.



Piston rings are installed with marking or beveled side up see diagram above.

Coolant Level

Coolant level in the coolant bottle must be maintained to prevent overheating and serious engine damage. Check the coolant with the engine temperature cold. The coolant level should be at the FULL COLD level mark. If it is not add coolant to the FULL COLD mark on the bottle. If you have coolant over the FULL COLD level you may have air in the system and need to "bleed" the air out of the system.

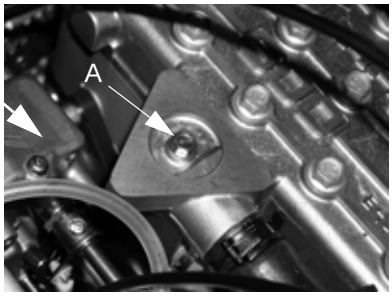


Recommended Coolant

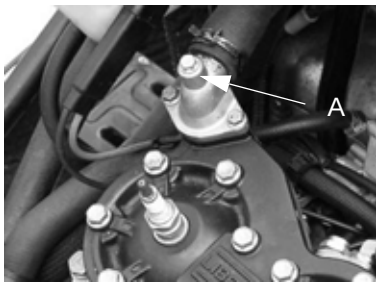
Polaris snowmobiles use a premium 60/40 pre-mix antifreeze. This premium antifreeze is mixed with deionized water for better protection for aluminum cooling. This pre-mix is good for temperatures down to -62°F (-52°C). Replace coolant every 2 years or if contaminated.

Cooling System Bleeding

1. Allow the cooling system to cool completely.
2. Check the coolant reservoir and make sure it is at the FULL COLD mark.
3. Place the snowmobile in its normal riding position and apply the parking brake and run the engine at the specified idle RPM until the thermostat opens up.
4. Elevate the front of the machine slightly.
5. Open the bleed screw (A) at the top of the water outlet manifold.Only open slightly, do not remove the screw.



500 Fuji



500/600/700 Liberty

6. Cycle the RPM from idle to 3000-4000 so that the coolant can move around the system and push out the air from the system.
7. Tighten the bleed screw when coolant starts to come out of the screw area.
8. Turn off the machine and release the parking brake.
9. Allow the system to cool completely and recheck the coolant level.

NOTE: It is important that the thermostat stays open @ 120° F (50° C).When the thermostat opens it will draw in cold coolant from the heat exchangers and the cold coolant may close the thermostat again.

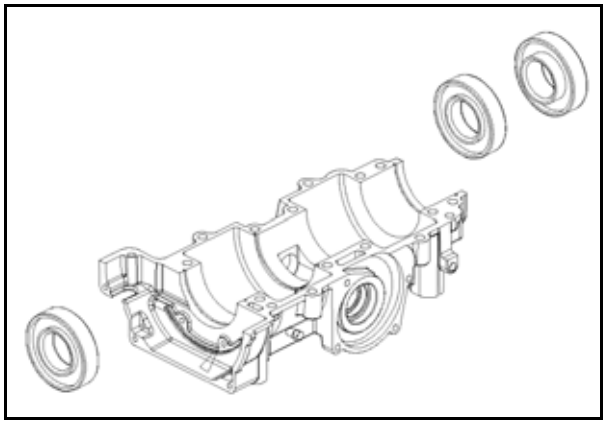
Make sure the thermostat opens and stays open! Cycle the RPM from idle to enough RPM (3500) to get coolant to flow but not enough RPM to engage the clutch. This allows air to bleed from the rear crossover tube. It is important to get enough coolant flow to purge the air from the front close-off cooler and observe this air reaching the bottle.

NOTE: Once the thermostat is open tip the snowmobile slightly on its right side and cycle the RPM from idle to enough RPM (4000) to get coolant to flow but not enough RPM to engage the clutch. Then tilt the machine slightly on its left side so that the coolant bottle is the highest point in the cooling system and cycle the RPM from idle to enough RPM (4000) to get coolant to flow but not enough RPM to engage the clutch.

⚠ WARNING

When performing the following checks and adjustments, stay clear of all moving parts to avoid serious personal injury. Never remove the pressure cap when the engine is warm or hot. If the pressure cap is to be removed, the engine must be cool. Severe personal injury could result from stream or hot liquid.

Bearing Fit

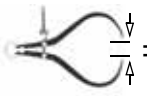


Any time crankshaft bearing failure occurs and the case is to be reused, Polaris recommends checking the bearing fit into the case halves using the following procedure.

With case halves cleaned, press a replacement bearing into each of the main bearing journals to determine a basic amount of press fit.

Do a comparison check of all journals by manually forcing the bearing into the bearing seats noting if any are noticeably loose or tight. Normal hand installation will be an indication of the recommended interference fit. If the bearing falls out of the case when the case is inverted, or if the crankcase bearing surface is severely galled or damaged, the case should be replaced.

NOTE: Crankcase bearing interference fit is .001-.002" (.026-.051mm).

 **= In. / mm.**

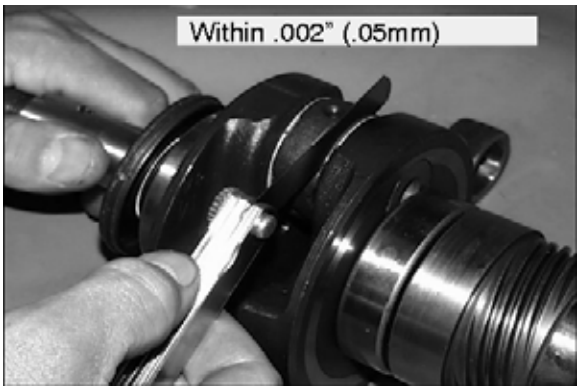
Bearing Interference Fit: .001-.002" (.026-.051mm)

Main Bearing

Clean crankshaft thoroughly and oil main and connecting rod bearings with Polaris engine oil. Carefully check each main bearing on the shaft.

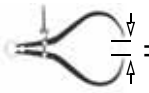
Due to extremely close tolerances, the bearings must be inspected visually, and by feel. Look for signs of discoloration, scoring or galling. Turn the outer race of each bearing. The bearings should turn smoothly and quietly. The inner race of each bearing should fit tightly on the crankshaft. The outer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

Connecting Rod (Big End) Bearing



Specialized equipment and a sound knowledge of crankshaft repair and straightening is required to perform crankshaft work safely and correctly. Crankshaft repair should be performed by trained Polaris service technicians in a properly equipped shop.

Measure connecting rod big end side clearance with a feeler gauge. 500/600/700 Liberty™ engines should have a clearance of .011 - .030" (.28 -.75mm) and be equal on all rods within .002" (.05mm).



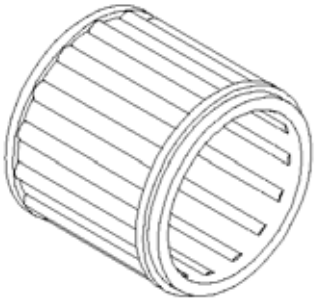
500/600/700 Liberty Engine Connecting Rod (Big End) Side Clearance: .011-.030" (.28-.75mm)

Rotate the connecting rod on the crankshaft and feel for any rough spots. Check radial end play in rod by supporting rod against one thrust washer and alternately applying up and down pressure. Replace bearing, pin, and thrust washers if side clearance is excessive or if there is any up and down movement detectable in the big end bearing.



Wrist Pin Bearing

1. Clean the end of the connecting rod and inspect inner bore with a magnifying glass. Look for any surface irregularities including pitting, wear, or dents.



NEEDLE BEARING

2. Run you fingernail around the inside of the rod and check for rough spots, galling, or wear.
3. Oil and install needle bearing and pin in connecting rod.
4. Rotate pin slowly and check for rough spots or any resistance to movement.
5. Slide pin back and forth through bearing while rotating and check for rough spots.
6. With pin and bearing centered in rod, twist ends back and forth in all directions to check for excessive axial play.
7. Pull up and down evenly on both ends of pin to check for radial play.
8. Replace pin and bearing if there is any resistance to rotation or excessive axial or radial movement. If play or roughness is evident with a new pin and bearing, replace the connecting rod.

Crankshaft Indexing

⚠ CAUTION

Disconnect the battery ground cable and ALL spark plug high tension leads. Ground high tension leads to the engine. Disconnect lanyard (if equipped) and/or press the engine stop switch before proceeding with the following procedure.

Polaris uses crankshafts that are pressed together. The connecting rod journal center lines are indexed 180° apart from each other.

It is sometimes necessary to check multi-cylinder crankshafts to verify that one cylinder has not been forced out of position relative to the other cylinder. Some causes for a “out of index” crankshaft include but are not limited to the following:

- Hydrolock from water or fuel
- Impact to drive clutch from object or accident
- Abrupt piston or other mechanical failure
- Engine lock-up due to drive belt failure

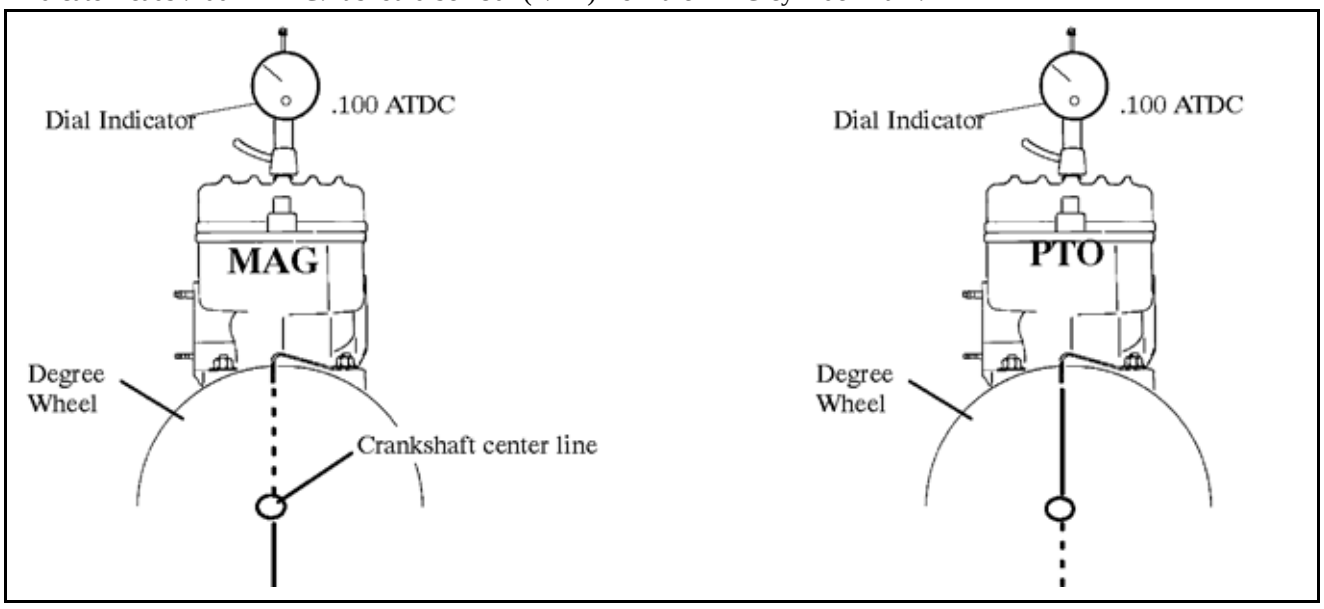
Checking Crankshaft Index

1. Remove the drive belt. See “Drive Belt Removal” on page 6.10.
2. Remove the drive clutch. See “Drive Clutch Removal” on page 6.15.
3. Securely fasten a large degree wheel on the flywheel or PTO end of the crankshaft. Make sure that it is mounted concentrically with the crankshaft center line.
4. With a section of wire (wire coat hanger), anchor it to a convenient spot. Bend one end at the outer perimeter of the degree wheel as shown below.
5. Install a dial indicator into the magneto end cylinder spark plug hole. The ignition timing is referenced by the magneto end.
6. Locate TDC as accurately as possible by finding the center of the point where there is no piston movement note the “Zero” the dial indicator at this point.

7. Continue to rotate the crankshaft in the normal direction of rotation until the dial indicator reads .100" (2.54mm) after top dead center (ATDC).
8. Bend the pointer or move the degree wheel until the pointer aligns with a 180° mark on the degree wheel.
9. With the pointer aligned, make sure the degree wheel and pointer are secured and will not move out of position. Re-check accuracy of this location a few times. The pointer should align with the 180° mark when the dial indicator reads .100" (2.54mm) ATDC.

NOTE: Do not move the crankshaft, degree wheel or pointer after the initial setting on the MAG end cylinder - simply read the wheel and dial indicator.

10. Remove the dial indicator and install in PTO cylinder. Repeat finding TDC. Note the degree wheel indication when the dial indicator reads .100" ATDC. It should be 180° (+/-2°) from the MAG cylinder mark.



Symptoms of an out of index crankshaft can include but are not limited to the following:

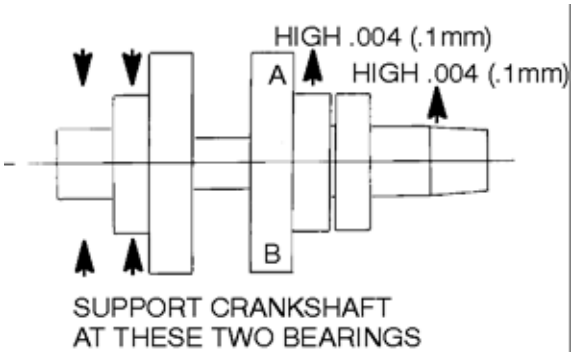
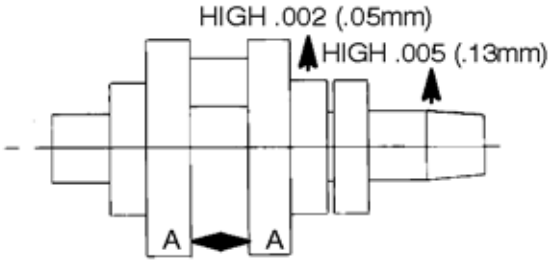
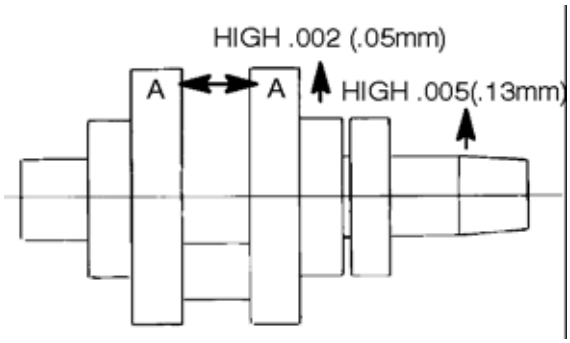
- Difficulty calibrating carburetor (repetitive plug fouling on one cylinder with no other cause)
- Unexplained piston failure on one cylinder (i.e. severe detonation, broken ring lands, piston holing)
- Excessive vibration of engine, back firing, etc.
- Rough idle, poor top speed.

Crankshaft Trueing

Lubricate the bearings and clamp the crankshaft securely in the holding fixture.If trueing the crankshaft requires striking with a hammer, always be sure to re-check previously straightened areas to verify trueing. Refer to the illustrations below. Use Crankshaft alignment kit PN 2870569.

NOTE: The Rod Pin position in relation to the dial indicator tells you what action is required to straighten the shaft.

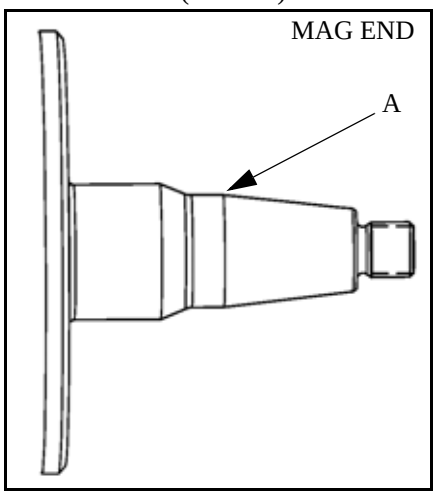
Truing Examples

To correct a situation like this. Strike the shaft at point A with a brass hammer.	
To correct a situation like the one shown in this. Squeeze the crankshaft at point A. You will use the tool from the alignment kit PN 2870569.	
If the crank rod pin location is 180° from the dial indicator (opposite of above), it will be necessary to spread the crankshaft at the A position as shown in illustration 3. When rebuilding and straightening a crankshaft, straightness is of utmost importance. Runout must be as close to zero as possible.	

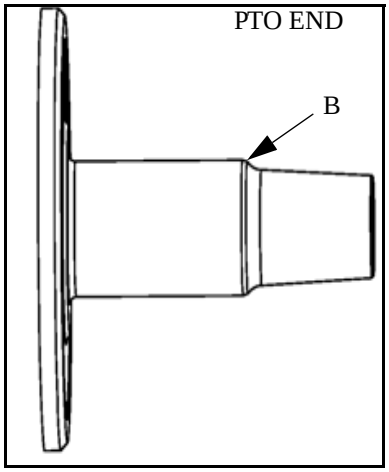
Crankshaft Runout Inspection

Crankshaft runout can be checked with the engine in the machine. Using a dial indicator with the crankshaft holding fixture (PN 2870569) will yield the most accurate results.

When checking the crankshaft runout on the **MAG** side. Place the dial indicator end at 1/2" (12.7mm) from the bearing flat (A).

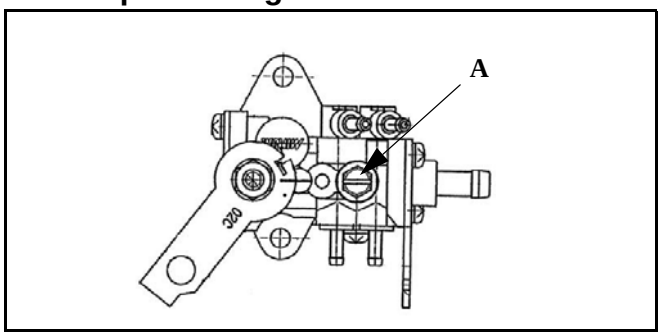


When checking the crankshaft runout from the **PTO** side. Place the dial indicator end where the taper starts after the bearing flat (B).



NOTE: Acceptable crankshaft runout (in a crank fixture) is 0 - .0015" (0 - .04mm) on Liberty™ engines. 0 - .0025" (0 - .07mm) on Fuji engines.

Oil Pump Bleeding

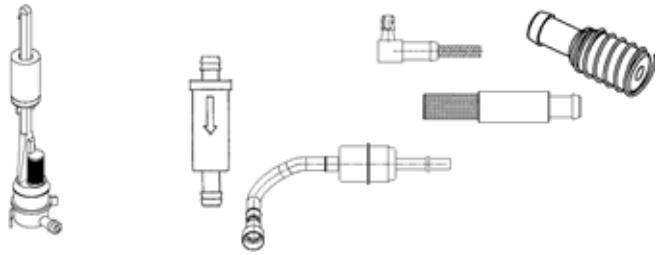


1. To aid in bleeding the air out of the oil lines, fill oil reservoir with the appropriate Polaris injector oil. This will add pressure to the oil lines.
2. Loosen the bleed screw (A). After approximately 30 seconds oil should flow from beneath the screw head. This will indicate the pump is free of the air.
3. Tighten bleed screw (A) securely.

NOTE: Any time that the engine is disassembled or repaired, it is important that the oil supply from the oil pump be checked and full of oil.

IMPORTANT: The oil pump must always be bled following any service to the oil injection system or engine.

Oil / Fuel Filter



⚠ CAUTION

The in tank fuel filter and fuel lines should be inspected regularly. Special attention should be given to the fuel line condition after periods of Summer storage. Normal deterioration from weather and fuel can occur during this storage period. Do not damage fuel lines when removing them. If a fuel line has been damaged or kinked it must be replaced.

NOTE: The direction of the arrow indicates the direction of the flow through the filter. After changing the oil filter, the oil injection system must be bled of all trapped air. see "Oil Pump Bleeding" on page 3.12.

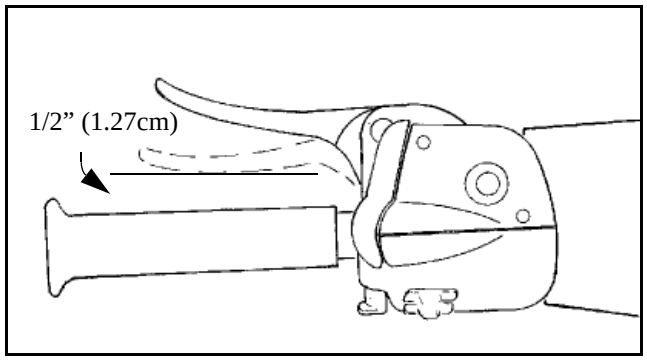
Most models use an oil and fuel filters which are of a special design and must not be substituted. These filters should be changed and the oil and fuel lines should be inspected annually or every 1000 miles (1600 km).

These filters may have an arrow on the filter or line. This arrow is the direction of flow. Install accordingly.

EDGE models utilize a special oil filter that is built into the oil sending unit located in the bottom of the oil tank. It should be replaced every two years or 2400 miles (3862 km).

CFI models fuel filter should be replaced every 1000 miles (1600km).

Brake Lever Travel



The brake lever travel should have a clearance no less than 1/2" (1.27cm) from the handlebar grip. Inspection should be made with the lever firmly depressed. If the lever has less than this amount you may need to bleed the brake system. See "Brake Fluid Replacement & Bleeding" on page 7.20.

Brake Fluid

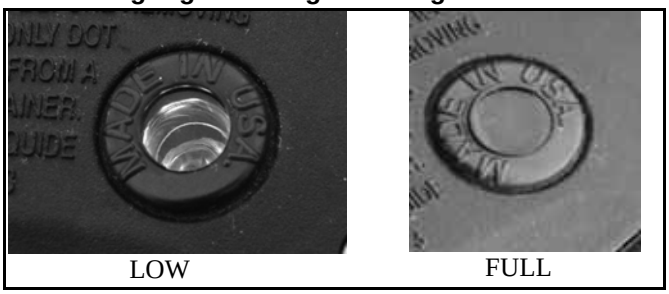
⚠ WARNING

Do not over fill the master cylinder. Fluid expansion could cause brakes to lock, resulting in serious injury or death. Once a bottle of brake fluid is opened, use what is necessary and discard the rest. Do not store or use a partial bottle of brake fluid. Brake fluid is hygroscopic, meaning it rapidly absorbs moisture from the air. This causes the boiling temperature of the brake fluid to drop, leading to early brake fade and the possibility of serious injury

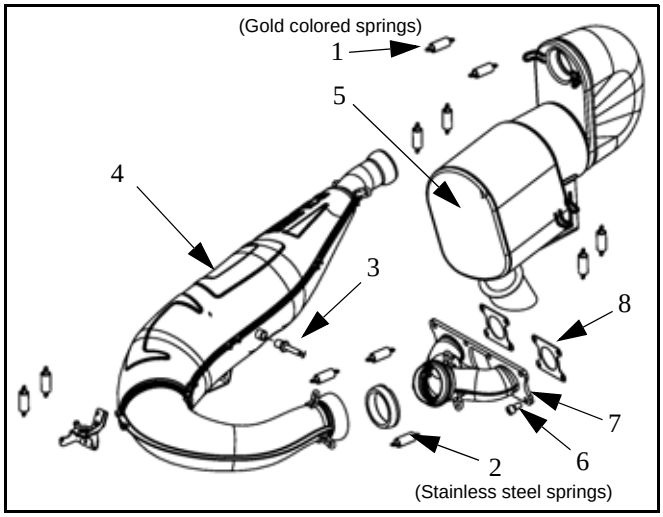
Inspect the reservoir to be sure it contains the correct amount of fluid. Use only Polaris DOT 4 high temperature brake fluid. Change fluid every 2 years or whenever the fluid is dark or contamination is suspected.

See "Brake Fluid Replacement & Bleeding" on page 7.20.

NOTE: A low brake fluid level can be indicated through the sight glass on the cover. If the fluid is low this sight glass will glow a brighter. color.



Exhaust System Removal/Installation



1. Remove the exhaust springs (1,2) with Exhaust Spring Tool PN PU-45485.
2. Disconnect exhaust temperature sensor (3) if so equipped.
3. Remove the exhaust pipe (4).
4. Remove resonator fasteners if equipped.
5. Remove the resonator (5).
6. Replace in reverse order.

NOTE: The light gray springs (2) are made stainless steel and should be used at the head pipe.

Manifold Installation

1. Install new exhaust manifold gaskets (8).
2. Place the exhaust manifold (7) on to the engine and torque the mounting bolts (6) to 18 ft-lb (24 N-m).

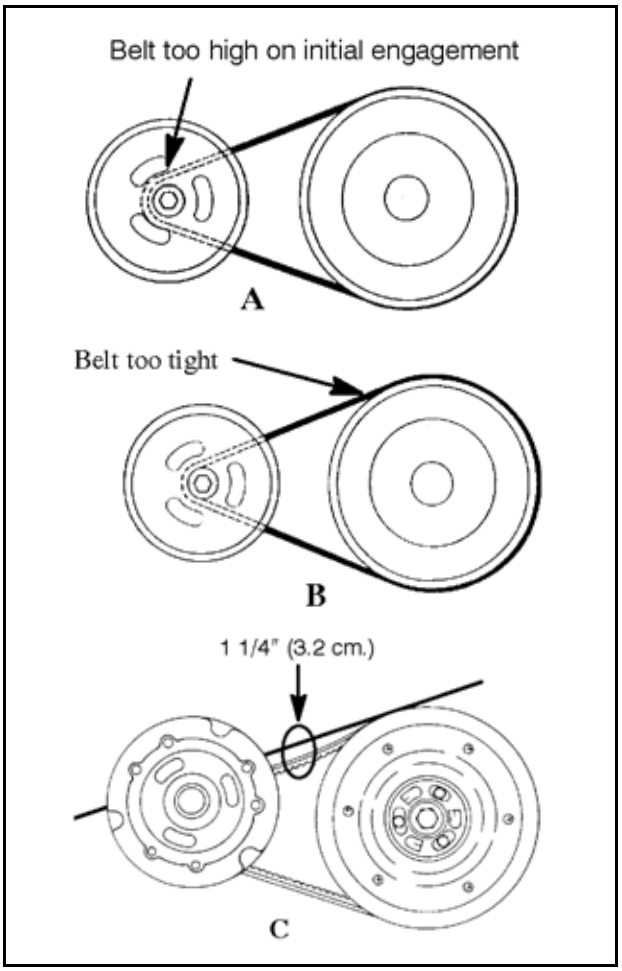
= T
Manifold Fasteners: 18 ft-lb (24 N-m)

Belt Deflection Inspection

Belt deflection is critical for optimum belt performance and belt life. It should be checked at 500 miles (800km) and then in 1000 mile (1600km) increments after that.

Too much belt deflection is when the belt is too long or the center distance is too short. The initial starting ratio will be too high, resulting in performance loss. This is due to the belt rising too high in the drive clutch sheaves upon engagement (A).

Not enough belt deflection (B) is when the belt is too short or the center distance is too long. The initial starting ratio will be too low. In addition, the machine may creep when the engine idles, causing damage to the internal face of the drive belt.



Measuring Belt Deflection

1. Measure the belt deflection with both clutches at rest and in their full neutral position.
2. Place a straight edge across the tow clutches, on top the belt.
3. Apply downward pressure to the belt and measure the distance at point (D).
4. The measurement should be 1 1/4" (3.2cm).



Belt Deflection: 1.25" (3.2cm)

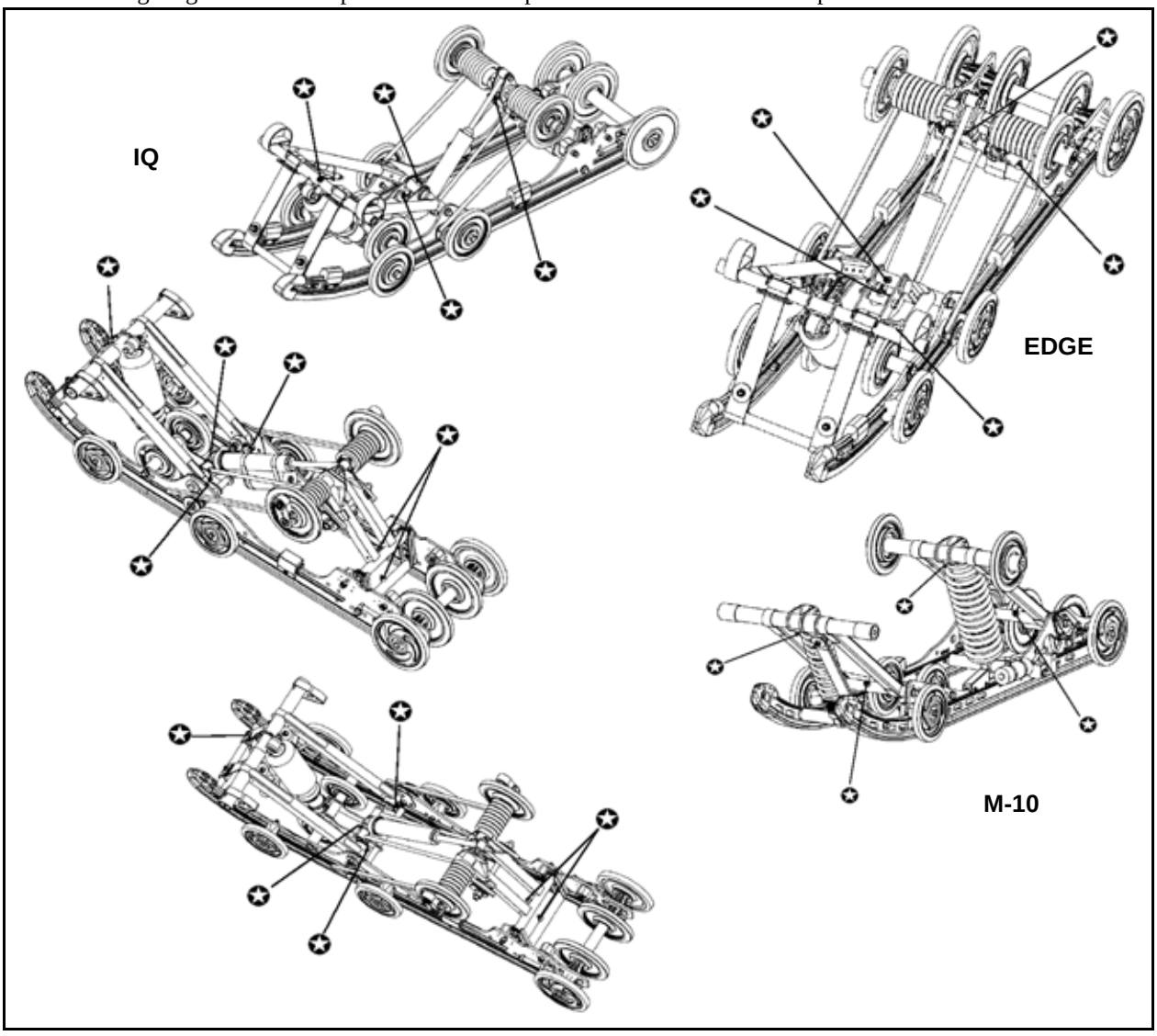
5. If the measurement is not correct adjust driven clutch. See “Adjusting Belt Deflection” on page 6.11.

LUBRICATION

Lack of lubrication will adversely affect your ride and the life of the sleds components. Lubricate with Polaris Premium All Season Grease at 500 miles (800km) initially, every 1000 miles (1600km) after that, and before off-season storage each year. A grease gun kit, complete with grease and adaptors, is available to lubricate all fittings.

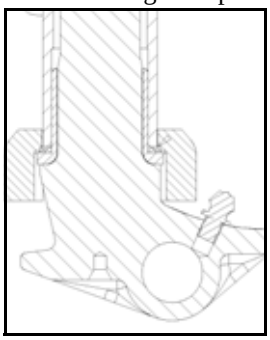
Rear Suspension

- The following diagrams are examples of lubrication points found on some rear suspensions.



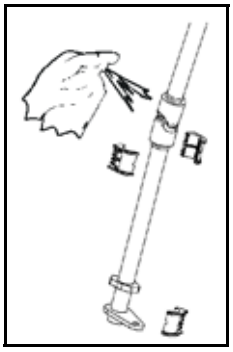
Front Suspension

- If grease zerks are present grease the left and right spindles. Raise the front end of the machine to permit better grease penetration into the spindle area.



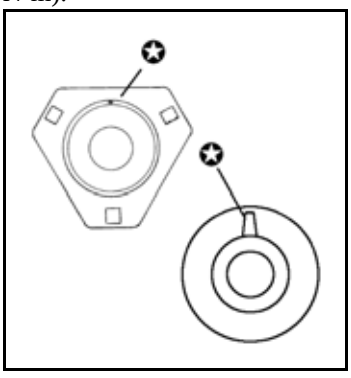
Steering

- Lubricate the steering post U-Joint and lower pivot with Polaris engine fogging oil.
- Grease the center steering arms.



Jackshaft Bearing

Loosen the driven clutch retaining bolt and pull the clutch toward you to expose the bearing and grease fitting. Inject grease into the grease fitting in the flangette until grease purges from the inside or outside of the bearing seal (may take only two pumps). Push the clutch back onto the shaft and replace the clutch retaining bolt. Torque the retaining bolt to 18 ft-lbs (24.4 N-m).



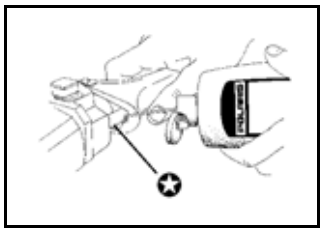
Driveshaft Bearing

Inject grease into the fitting on the speedometer sensor housing until grease purges from the seal on the inside of the tunnel. This should take approximately two pumps. Do not use more than four pumps.



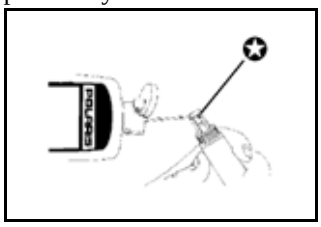
Throttle Cable

Lubricate the throttle cable lightly with fresh oil. With the engine off, turn the handlebars to the left and lubricate well as shown.



Choke And Choke Cable

Lubricate the choke slide and cables lightly with oil or grease. Before turning the engine off, operate the choke intermittently to draw moisture out of the choke plunger area and reduce the possibility of the choke becoming frozen.

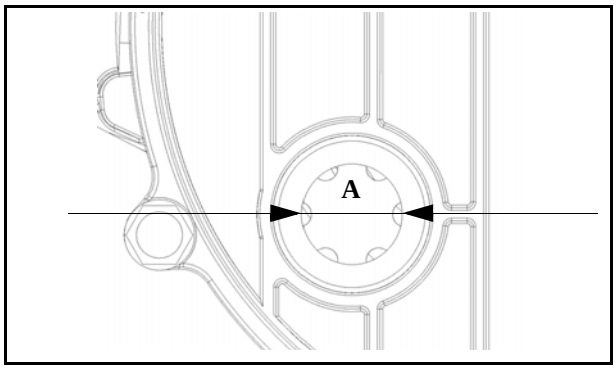


Chaincase Oil

Check the chaincase oil level at the interval outlined in this maintenance section. Change the chaincase oil after the first 500 miles (800 km), then every 1000 miles (1600 km) or seasonally.

Maintain the oil level between the “safe” marks on the dipstick whenever checking or changing oil.

1. Position the vehicle on a level surface
2. Remove the dipstick or fill plug and view the oil level on the dipstick.
3. Add the recommended oil as needed. Do not overfill.
4. Level indication:



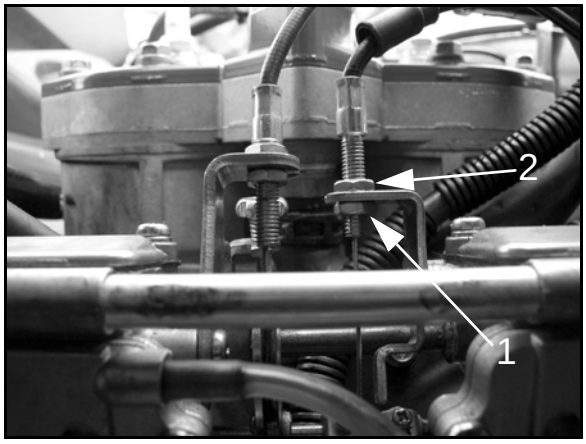
- Units equipped with a sight glass need should be filled to the 1/2 way mark (A)
- Units equipped with a dip stick only need to be filled to the safe marks located on the dip stick.

5. Clean the magnetic plug on the dipstick or fill plug.
6. Reinstall the dipstick or fill plug.
7. Remove the dip stick and check the fluid level on the dipstick. Make sure it is within the “safe” level.

ADJUSTMENTS

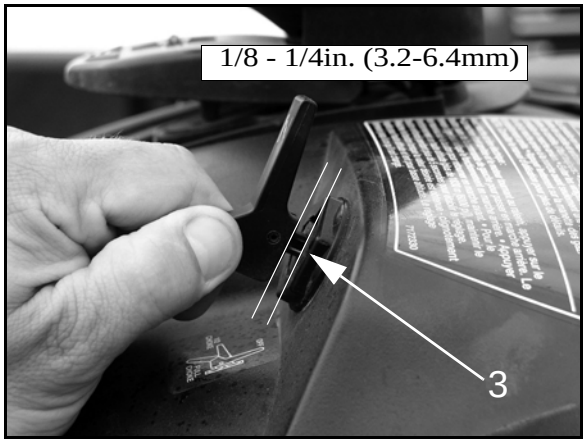
Choke Adjustment

1. Flip the choke toggle to the “OFF” position.
2. Loosen locknuts (1) on the carburetor.



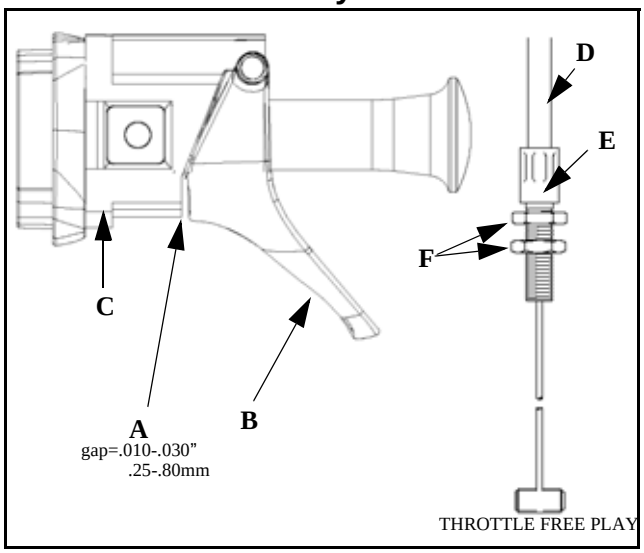
3. Turn sleeve adjusting nut (2) counter-clockwise until the choke toggle shows no free play when pulled, then rotate it clockwise until there is between 1/8 - 1/4in (3.2-.6.4mm) free play (3).

NOTE: Verify the cable does not lift the plungers when checking the free play.



4. Tighten adjustment locknut (2).
5. On VM carburetors, repeat steps 2 and 3 for on the other carburetor.

Throttle Lever Free Play - Non CFI



= In. / mm.

Throttle Lever Free Play: 0.010"-0.030" (.25-.8mm)

CAUTION

When adjusting throttle lever free-play, always verify the engine RPM does not rise with bars in the full low and full up-right Rider Select positions (if applicable) and while turning the handlebars to the full left and full right positions.

Throttle lever free play must always be at a specified clearance (A) 0.010”-0.030” (0.25-0.80 mm) between the throttle lever (B) and the throttle block (C). This clearance is controlled by the throttle cable (D).

If adjustment is needed follow these steps:

CAUTION

After any idle speed adjustments are made, the throttle lever clearance and the oil pump adjustment must be checked and adjusted.

1. Check the idle RPM and verify it is within the specified range.
2. Shut off engine.
3. Locate the throttle cable that is attached to the carburetors and adjust the throttle free play by adjusting the barrel nut (E) and lock nuts (F).
4. Once you achieve the proper free play of 0.010”-0.030” (.25-.80mm), tighten the lock nuts.
5. Verify the oil pump index marks are within specification.
6. Check the idle RPM and verify it is within the specified range.

NOTE: If the idle speed screw is adjusted inward and the cable sleeve is not adjusted to take up the throttle lever clearance, the engine may misfire or kill upon initial throttle opening.

Throttle Lever Free-Play - CFI Models

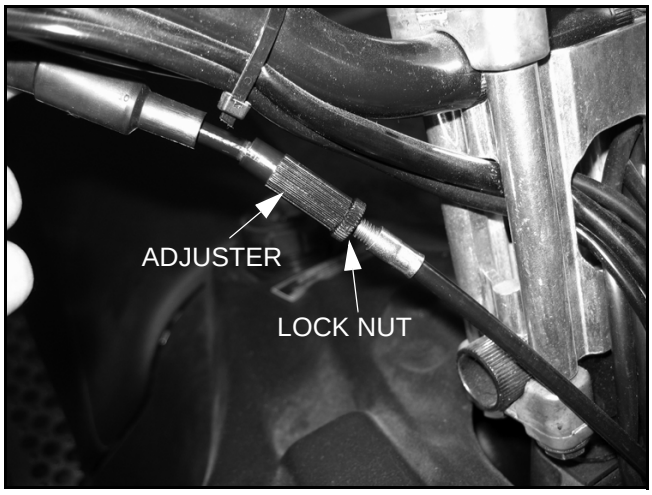
CAUTION

When adjusting throttle lever free-play, always verify the engine RPM does not rise with bars in the full low and full up-right Rider Select positions (if applicable) and while turning the handlebars to the full left and full right positions.

= In. / mm.

Throttle Lever Free Play: 0.010"-0.030" (.25-.8mm)

The inline adjuster should only be used to set free play and to remove cable slack that occurs if the cable has stretched over time.



NOTE: Never use the in-line adjuster to adjust engine idle speed and never adjust the cable so that the throttle plate cam on the throttle body no longer rests against the idle air gap screw.

Turning the in-line adjuster inwards (clockwise) will increase throttle lever free-play.

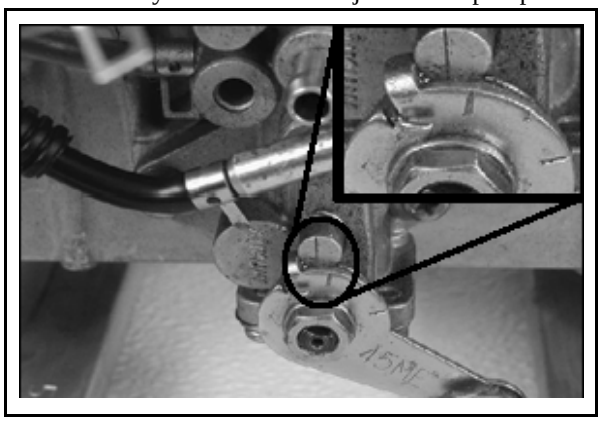
Turning the in-line adjuster outwards (counter-clockwise) will decrease throttle lever free-play.

After setting the throttle lever free play, always verify the oil pump adjustment is set correctly.

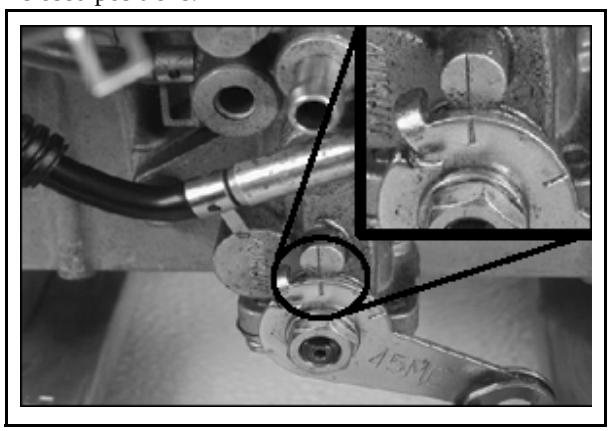
Oil Pump Adjustment

NOTE: Use a mirror to accurately view the alignment marks.

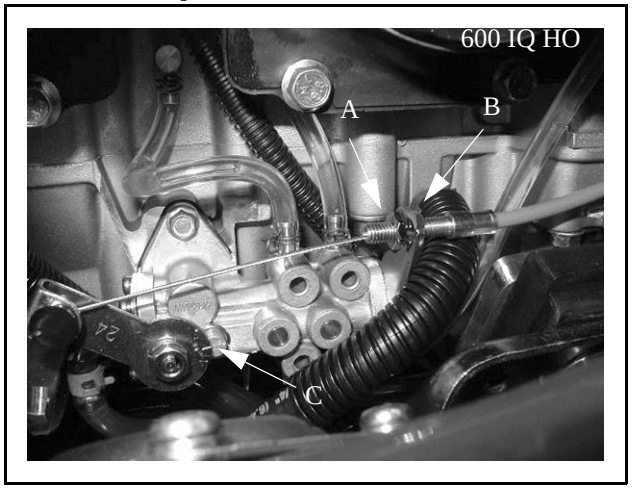
1. On some engines the oil pump is located under the intake boots and you may have to remove the air box and may need to unplug the CDI box and coils.
2. Verify carburetor/throttle body synchronization.
3. Loosen the carburetor boot adapters and carefully move them so that you can see and adjust the oil pump cable.



4. Verify that the oil pump alignment marks are aligned at the point where the throttle slides begin to rise from their fully-closed positions.

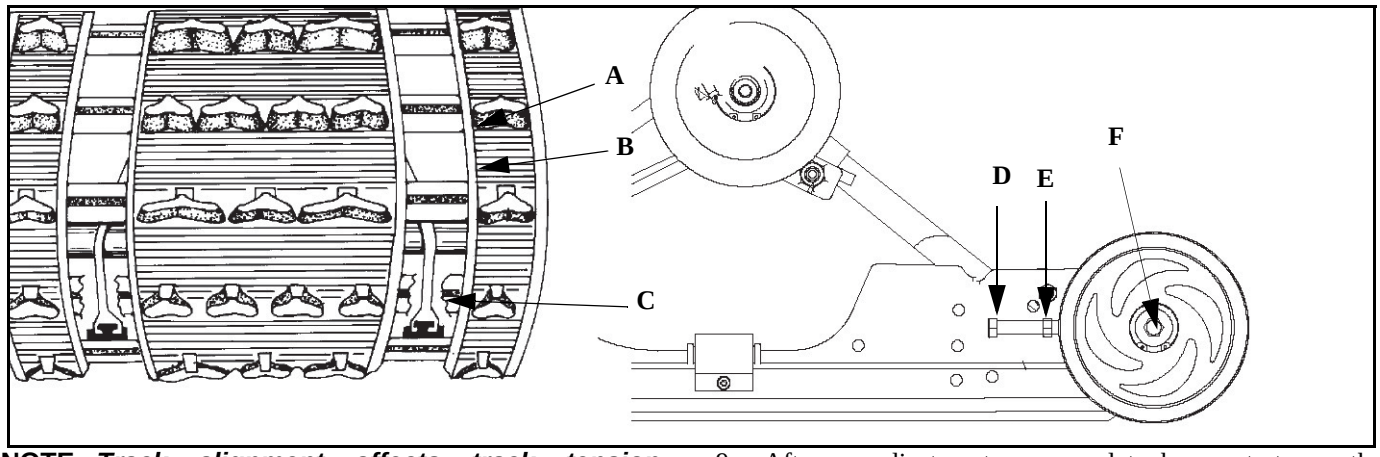


5. If they are not aligned, make the necessary adjustments by adjusting the oil pump cable. In small increments, loosen the lock nut that is closest to the oil pump (A). and move the mark that is on the oil pump arm by tightening or loosening the adjustment nut (B) as needed to get the line to the desired position.



6. Lock the lock nut (A).
7. Verify that the oil pump marks line up (C) as outlined in step 4.
8. Re-install carburetors, air box and plug in the CDI and coils if they were taken off in step 1.
9. Check idle to specification and adjust if needed.

Track Alignment



NOTE: ***Track alignment affects track tension. Misalignment of the track will cause excessive wear to the track, rail slides, and rail.***

NOTE: ***Excessive rail slide wear occurs due to running in inadequate snow conditions.***

Periodically check that the track is centered and running evenly on the slide rails. Misalignment will cause excessive wear to the track and slide rails.

1. Safely lift and support the rear of the snowmobile off the ground.
2. Rotate the track by hand to check for any possible damage.
3. Inspect the track rods (A) carefully and examine the track along the entire length of each rod, bending the track edge and inspecting it for breakage. If any rod damage is found, the track should be replaced.
4. Warm up the track by starting the engine and apply a small amount of throttle so the track runs slowly at least five complete revolutions.
5. Stop the engine and turn the ignition off.
6. Inspect track alignment by carefully looking through the track window (B) to make sure the rails (C) are evenly spaced on each side.
7. If the track runs to the left, loosen the left locknut and tighten the left adjusting bolt (D). If the track runs to the right, loosen the right locknut and tighten the right adjusting bolt. It may be necessary to check this with the engine rotating the track. Be sure to SHUT THE MACHINE OFF before making any further adjustments.
8. Loosen up the rear idler shaft (F).
9. After any adjustments are complete, be sure to torque the locknuts (E) to 35 ft-lb (48 N-m).

= T
Adjuster Lock Nuts: 35 ft-lb (48 N-m)

10. Torque both idler shaft bolts (F) to 35 ft-lb (48 N-m).

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Idler Shaft Bolt: 35 ft-lb (48 N-m)

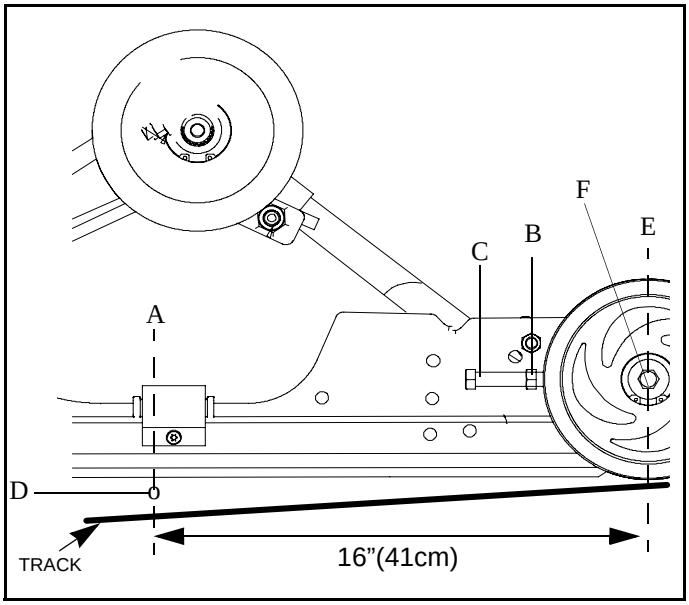
⚠ WARNING

Broken track rods can cause a rotating track to come off the machine. Never operate or rotate a damaged track under power with a broken rod. Serious injury or death may occur.

⚠ WARNING

When performing the following checks and adjustments, stay clear of all moving parts to avoid personal injury. Never make any adjustments with the engine running, as serious personal injury can result.

Track Tension



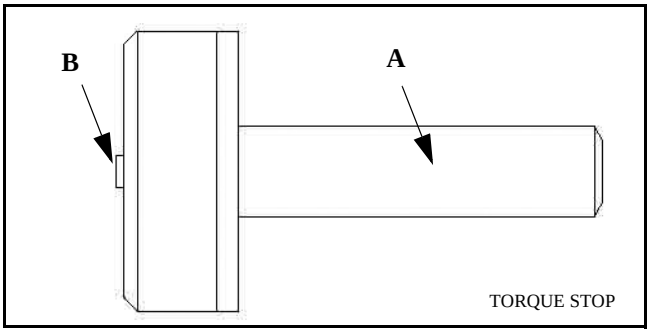
Track tension is critical for maintaining correct suspension operation. If the track tension is too loose it may cause the track to slip or “ratchet” on the drive shaft drivers and cause the track and rear suspension durability problems. If the track is too tight it will wear down the rail slides, reduce top speeds, cause rear suspension vibration and cause track and rear suspension durability problems.

1. Lift the rear of the machine and place a jack stand or secure the rear of the machine so that the track is off of the ground.
2. Start the engine and slowly let the engine turn the track over. This will warm up the track for a correct measurement.
3. Shut off the engine.
4. Place a 10 lb. (4.54kg) weight at point (A). Point (A) is 16” (41cm) ahead of the rear idler shaft (E).
5. Measure the distance (D) between the rail slider and the track. This measurement should fall with in the measurement range for the appropriate vehicle, see chart o this page.
6. If adjustment is needed, loosen up the lock nuts (B) on each side.
7. Loosen up the idler shaft bolts (F).
8. Turn each adjuster bolt (C) toward the idler wheel (clockwise) if you need less of a measurement. Turn the adjuster bolt (C) toward the front of the sled (counterclockwise) if you need a greater measurement.
9. When you achieve the correct tension listed below, torque the lock nuts (B) and idler shaft bolts on each side to 35 ft-lb (48 N-m).

NOTE: Track alignment affects track tension. Misalignment will cause excessive wear to the track and slide rails. Excessive slide wear will appear on units with the track tension set too tight (or below measurement specification).

SUSPENSION	MEASUREMENT
IQ 121, IQ Touring, IQ LX	7/8" - 1 1/8" (2.2-2.9cm)
RMK, Switchback, 340 LX, 500 XCSP, 550 LX, SuperSport, Trail RMK	3/8" - 1/2" (1-1.3cm)
Wide Track LX	3/4" "- 1" (1.9-2.5cm)
340 Touring, Trail Touring	1 1/8" - 1 3/8" (2.9-3.5cm)

Rear Engine Torque Stop Adjustment



After aligning clutches, adjust the rear torque stop (A) by loosening the lock nut and rotating the stop so that the clearance is 0.010” - 0.030” (0.25 - 0.75mm) from the whole surface of the torque stop.

If replacing a new torque stop, adjust the torque stop so that the tip (B) is touching the engine case.

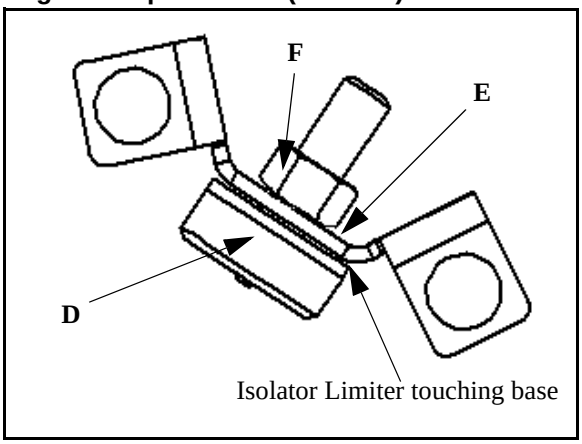
= T
Torque Stop Jam Nut: 15-17 ft-lb. (21-24 N-m)

Engine Isolator Limiter Setting

Adjust the front engine isolator limiter so that the stop (D) is bottomed out on the brace (E).

Hold the engine isolator limiter (D) and torque the jam nut (F) to specification.

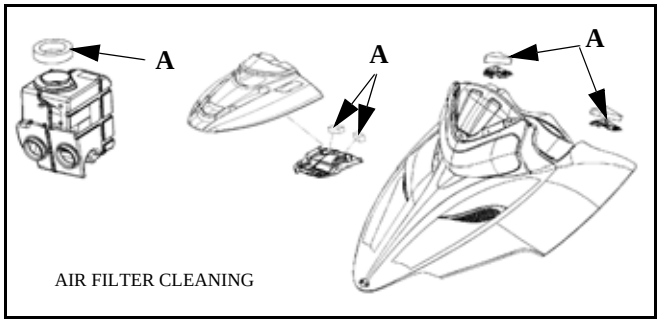
NOTE: Do not adjust this engine isolator limiter as a torque stop or damage may occur. The approximate distance from the face of the isolator to the face of the engine strap is 0.107" (2.72mm).



= T
Jam Nut: 15-17 ft-lb. (21-24 N-m)

CLEANING

Air Filter



The intake foam filter (A) limits snow ingestion into the intake system. When operating in loose powder, check the top of the foam filter periodically to remove any accumulation of snow.

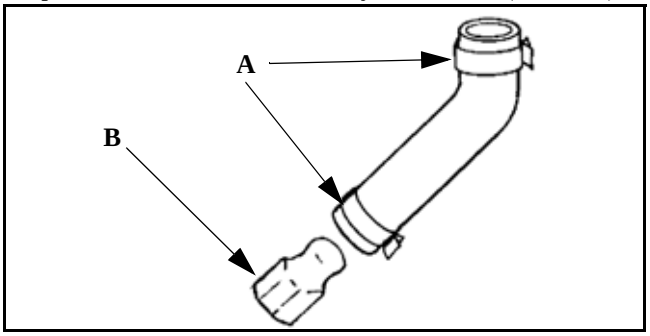
NOTE: Do not operate a machine with the intake filters removed. This may cause carburetor icing resulting poor fuel economy or engine damage.

Water Sediment Trap

WARNING

When draining the traps, fuel spillage will occur. Be sure to work in a well ventilated area away from anything which may cause the fuel to ignite such as an open flame, heaters, trouble lights or cigarettes.

Most Polaris snowmobiles incorporate a patented carburetor bowl water / sediment traps located at the bottom of each carburetor. The trap consists of a hose with a plug which should be inspected for contamination every 1000 miles (1600 km).



1. Turn the fuel tank supply valve to the “OFF” position.
2. Position a container or shop towels under the work area to help catch some of the contaminated gasoline.
3. Slide the clamp (A) away from the drain plug (B) and remove it from the sediment tube and drain the contaminated material from the bowl. Repeat for each carburetor.
4. Wipe off the residue from the plug and reinstall the clamps.

Nosepan Care

If your nosepan becomes dirty with soot, you can use Polaris Carbon Clean (PN 2872890) to remove the soot.

STORAGE

Chassis And Hood

Proper storage starts by cleaning, washing and waxing the hood, chassis, upholstery and plastic parts. Clean and touch up with paint any rusted or bare metal surfaces. Ensure that all corrosive salt and acids are removed from surfaces before beginning preservation with waxes and rust inhibitors (grease, oil, or paint).

If the machine is equipped with a battery, disconnect the battery cables and clean the cables and battery posts. Fill battery to proper level with distilled water and charge to full capacity. Remove and store the battery in a cool dry place.

The machine should be stored in a dry garage or shed out of the sunlight and covered with a fabric snowmobile cover. Do not use plastic to cover the machine; moisture will be trapped inside causing rust and corrosion problems.

Clutch And Drive System

Remove drive belt and store in a cool dry location. Lubricate sheave faces and ramps of drive and driven clutches with light oil or rust inhibitor. All lubrication applied as a rust preventative measure must be cleaned off before installing belt for service and operating machine.

Controls And Linkage

All bushings, spindle shafts and tie rod ends should be coated with a light coat of oil or grease. Throttle controls and cables should be lubricated. Force a small amount of lubricant down cables.

Electrical Connections

Separate electrical connector blocks and clean corrosive build-up from connectors. Lubricate or pack connector blocks with Nyogel™ grease and reconnect. Replace worn or frayed electrical wire and connectors.

Carburetor/Throttle Body

Fog engine with Polaris Fogging Oil (aerosol type) according to directions on can.

Fuel System

Treat the fuel system with Polaris Carbon Clean. If Polaris Carbon Clean is not used, fuel tank, fuel lines, and carburetor should be completely drained of gasoline.

Corrosion

To prevent corrosion, always grease jackshaft and drive shaft (clutch side) bearings with Polaris Premium all season grease. Loosen driven clutch retaining bolt and pull clutch outward to expose bearing. Use a point type grease gun fitting to inject grease through hole in flangette into bearing until grease purges out inside or outside bearing seal. Push clutch back on shaft and replace clutch retaining bolt. Inject grease into fitting on speedometer drive adaptor until grease purges out inside or outside the bearing seal. Lubricate both front ski pivots at bushings and spindles.

Shocks

Use T-9 Metal Protectant (or equivalent) on shock absorber shafts to help prevent corrosion.

Battery

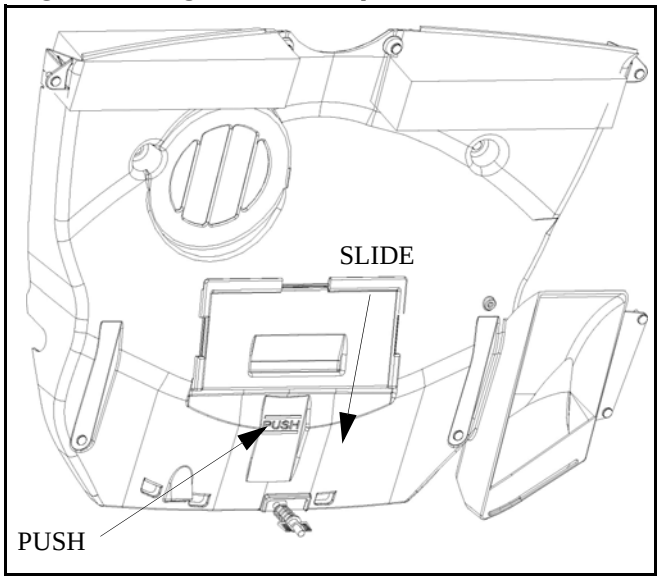
Disconnect and remove the battery. Clean the terminals and cables. Apply dielectric grease to the terminals. Store in a cool dry place for storage.

REPLACEMENT

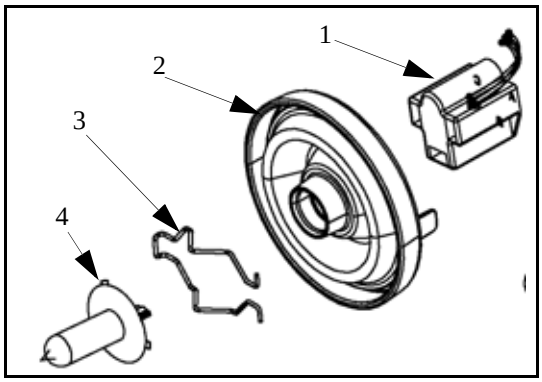
Headlight Bulb Replacement

NOTE: Do not touch the bulb with your fingers. The grease from body oil will cause a hot spot on the bulb and cause bulb failure. If you do touch the bulb clean the bulb with isopropyl alcohol.

Edge Headlight Bulb Replacement

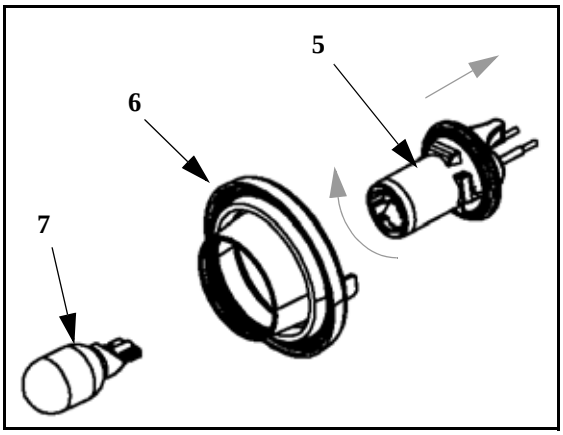


1. Push in on the “PUSH” section of the plenum.
2. Slide the access panel down to gain access to the bulb.
3. Squeeze and move the bulb clip up.
4. Replace the bulb, clip and access panel.



IQ Headlight Bulb Replacement

1. Unplug the headlight harness (1) form the bulb.
2. Remove the rubber boot (2) from the housing.
3. Pinch the ends of the spring (3) together and lift it until it releases from the spring retainer.
4. Lift spring carefully around the wire harness and flip it to the outside of the housing.
5. Grasp the bulb (4) by the metal base and carefully separate the bulb from the harness.
6. Instal new bulb by the base and reverse the process for installation.



IQ Snow Beam Bulb Replacement

1. Twist the light base (5) counterclockwise and pull it out from the housing.
2. Remove the rubber boot (6).
3. Remove the bulb (7) by pulling it straight out from the housing.
4. Replace bulb with new and reverse the process for installation.

Coolant Draining

> **WARNING**
>
> Wait until the engine is cool before removing the pressure cap. Removing the cap while engine is hot and the coolant is under pressure may cause serious scalding.

One method of draining coolant from an engine is to use low air pressure to aid the extraction of coolant.

1. Remove pressure cap.
2. Siphon as much coolant as you can from the coolant bottle and coolant lines.
3. Remove the top hose from the thermostat and insert it into an empty container.
4. Apply 3-5 psi of air pressure to the thermostat cover until no more coolant can come out of the thermostat hose that you inserted into the container.

NOTE: This will only get the majority of the coolant out. Some may remain in the system.

NOTES

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WARNINGS

When servicing the carburetor or fuel system, it is important to heed the following warnings.

> ⚠ WARNING
>
> Always stop the engine and refuel outdoors or in a well ventilated area

> ⚠ WARNING
>
> Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored or used.

> ⚠ WARNING
>
> Do not overfill the tank. Do not fill the tank neck.

> ⚠ WARNING
>
> If you get gasoline in your eyes or if you swallow gasoline, see your doctor immediately.

> ⚠ WARNING
>
> If you spill gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.

> ⚠ WARNING
>
> 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.

GENERAL INFORMATION

Service Precautions

In order to perform service work efficiently and to prevent costly errors, the technician should read the text in this manual, thoroughly familiarizing him/herself with procedures before beginning. Photographs and illustrations have been included with the text as an aid. Notes, cautions and warnings have also been included for clarification of text and safety concerns. However, a knowledge of mechanical theory, tool use and shop procedures is necessary to perform the service work safely and satisfactorily. Use only genuine Polaris service parts.

Cleanliness of parts and tools as well as the work area is of primary importance. Dirt and foreign matter will act as an abrasive and cause damage to precision parts. Clean the snowmobile before beginning service. Clean new parts before installing.

Watch for sharp edges which can cause personal injury, particularly in the area of the tunnel. Protect hands with gloves when working with sharp components.

If difficulty is encountered in removing or installing a component, look to see if a cause for the difficulty can be found. If it is necessary to tap the part into place, use a soft face hammer and tap lightly.

Some of the fasteners in the snowmobile were installed with locking agents. Use of impact drivers or wrenches will help avoid damage to fasteners.

Always follow torque specifications as outlined throughout this manual. Incorrect torquing may lead to serious machine damage or, as in the case of steering components, can result in injury or death for the rider(s).

If a torquing sequence is indicated for nuts, bolts or screws, start all fasteners in their holes and hand tighten. Then, following the method and sequence indicated in this manual. Tighten evenly to the specified torque value. When removing nuts, bolts or screws from a part with several fasteners, loosen them all about 1/4 turn before removing them.

If the condition of any gasket or O-Ring is in question, replace it with a new one. Be sure the mating surfaces around the gasket are clean and smooth in order to avoid leaks.

Some procedures will require removal of retaining rings or clips. Because removal weakens and deforms these parts, they should always be replaced with new parts. When installing new retaining rings and clips use care not to expand or compress them beyond what is required for installation.

Because removal damages seals, replace any oil or grease seals removed with new parts.

Polaris recommends the use of Polaris lubricants and greases, which have been specially formulated for the top performance and best protection of our machines. In some applications, such

as the engine, warranty coverage may become void if other brands are substituted.

Grease should be cleaned from parts and fresh grease applied before reassembly of components. Deteriorating grease loses lubricity and may contain abrasive foreign matter.

Whenever removing or reinstalling batteries, care should be taken to avoid the possibility of explosion resulting in serious burns. Always disconnect the negative (black) cable first and reconnect it last. Battery electrolyte contains sulfuric acid and is poisonous! Serious burns can result from contact with the skin, eyes or clothing. **ANTIDOTE**: External - Flush with water. Internal - Drink large quantities or 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.

FUEL DELIVERY SYSTEM (CARBURETED)

Carbureted System Overview

The carbureted fuel system contains many components which directly affect fuel mixture and performance. When performing diagnosis or carburetor maintenance, the entire fuel delivery system should be inspected.

Fuel filters should be replaced at least once per season. More often if contamination is suspected.

Fuel lines should be replaced every other season. More often if they become brittle or swollen. Fittings should be inspected for cracks or leaks. Do not use pliers or other tools that may damage fuel lines when installing or removing fuel lines.

Test run and check the fuel system for leaks any time parts are replaced. Verify that all lines are routed correctly and away from any moving parts.

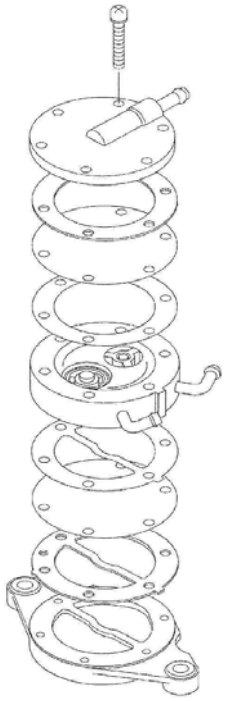
NOTE: Some models use fuel filters that are located inside the fuel tank. To inspect/replace filter, remove fuel cap and use a long clean wire, bend one end into a hook shape. Pull the fuel line that is in the tank up through the filler hole. Inspect filter on end of fuel pick up line. Replace if worn or clogged.

Red fuel line is the exterior line for outside the tank. The violet line is the interior line for inside the fuel tank. They cannot be interchanged! The violet line used inside the tank will fade and turn clear after a relatively short time. This does not affect the function or durability of the line.

When replacing fuel line, be sure to use the correct color line for inside or outside the fuel tank. Also, be very careful not to bend fuel line to a point of kinking it. If it becomes kinked, it must be replaced. Always inspect fuel lines when replacing, or if carbs, carburetor racks, or fuel pumps are removed from chassis.

FUEL PUMP (CARBURETED UNITS)

Fuel Pump Overview



The differences are in the size and location of the pumps. Pumps may be mounted to the engine, air/oil box or to the chassis.

In the two cycle engine, the pressure in the crankcase changes with the up and down stroke of the piston. The amplitudes of pressure vary according to the RPM and degree of throttle opening. Whether idling or at full throttle, the pressure built up in the crankcase has enough amplitude to operate the pump.

When the piston is on the upstroke, crankcase pressure in that cylinder becomes less positive. The diaphragm in the fuel pump moves toward the engine, causing a negative pressure or suction in the pump chamber. This causes the inlet valve from the fuel supply to open and permits fuel to enter the chamber. This same suction causes the outlet valve (to the carburetor) to close so that fuel cannot return to the carburetor. (340/550 style shown)

When the piston begins its downward stroke, the pressure from the crankcase becomes positive, causing the fuel pump diaphragm to move in the opposite direction and reversing the pressure in the fuel pump chamber. This causes the inlet valve in the pump to close and the outlet valve to open, filling the float bowl in the carburetor. When the float level in the carburetor reaches its standard level, the needle valve will close, preventing more fuel from entering the carburetor, even though the fuel pump continues to try to provide the carburetor with fuel.

Maintenance

The impulse operated diaphragm fuel pump does not require any specific scheduled maintenance. However, the following procedures should be observed:

- Operation

The pump may be checked for operation by removing the fuel supply line from the carburetor and placing it into a container. With the engine idling at approximately 2000 RPM, a steady flow of fuel should be visible.

- Cleaning

The pump and impulse line must be disassembled and cleaned of foreign material in the event of piston or other internal engine part failures which produce fragments.

- Inspection

Disconnect impulse line from pump. Connect a Mity Vac to impulse fitting (or line) and apply 4-6 PSI pressure. Diaphragm should hold pressure indefinitely.

The diaphragms and check valves must be carefully examined for cracks, holes, or other damage. If in doubt as to the condition of any internal parts, replace all diaphragms, check valves, and gaskets.

MIKUNI JET NEEDLE

Overview

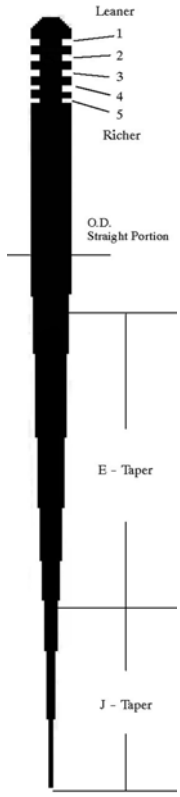
This needle (example) is a 9DH01-57. The first number is the approximate overall length in 10mm increments of the jet needle. The 9 indicates the needle is approximately 90mm but less that 100mm in length.

The letters on the jet needle indicate the angle of both tapers. The first letter designates the taper angle of the top section (closest to the grooves) and the second letter designates the angle of the bottom taper. The taper angles are graduated in 15' (15 minute) increments. The jet needle marked 9DH01-57 would have a top taper of 1_0' and a bottom taper of 2_0'.

The number following the letters on the jet needle is the serial number and it varies with individual jet needles.

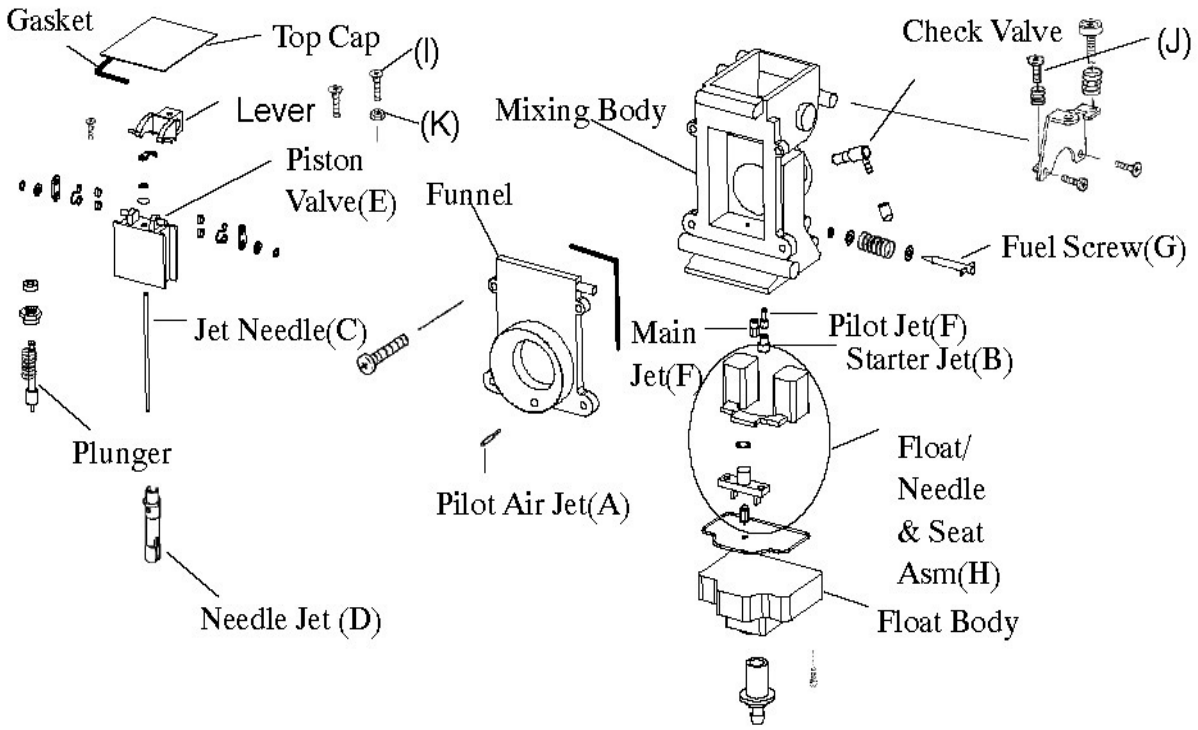
The last number, 57 indicates that the outside diameter is 2.57mm. The smaller the O.D., the richer the mixture.

9DH01-57



DESIGNATOR	DESCRIPTION
9	Overall length in 10mm increments
D	Taper of the **top** section of the needle
H	taper of the **bottom** section of the needle
01	Serial number
-57	Outside diameter (O.D.) of the straight portion

MIKUNI TM 38



Carburetor Overview

The advantages of the TM flatslide system include improved throttle response and a significant reduction in throttle effort due to rack style carbs and the use of cable cam. The following are the main components of TM carburetors and the functions of each components.

Pilot Air Jet (A): The pilot air jet controls the amount of air entering the engine in the idle circuit. The pilot air jet size is imprinted on it. Bigger pilot air jets allow more air to enter, leaning the idle mixture. If engine loads up at idle, first try turning fuel screw in. If not correct, try larger pilot air jet.

Starter Jet (B): The starter jet's function is to meter fuel entering the engine when choked. Larger numbered starter jets pass more fuel, therefore more fuel will enter the system when jetting to a larger size. Like the pilot air jet, the jet size is imprinted.

Jet Needle (C): The jet needle performs the same functions as on Mikuni VM carburetors. However, the needles in the TM-38 carburetors are longer and are not interchangeable with VM needles. To raise or lower the needle, remove the top cap (D) and loosen the 2.5mm Allen screw holding the needle in place. Reach inside with a long nose pliers and pull the needle out. The C-clip can then be adjusted for the desired effect.

Needle Jet (D): The needle jet is press fit into carbs and is not replaceable.

Piston Valve or Throttle Valve): The throttle valve controls the rate of engine air intake by moving up and down inside the main bore. At small throttle openings, air flow control is performed chiefly by the cutaway. By controlling air flow the negative pressure over the needle valve is regulated, in turn varying the fuel flow

Main Jet and Pilot Jet (F): The main jets (hex) and pilot jets (air bleed type) are identical in style and function as the Mikuni VM carbs. There is a washer on a main jet that is staked and should not come out. The part numbers for main jets and pilot jets are the same as Mikuni VM round slide carburetors.

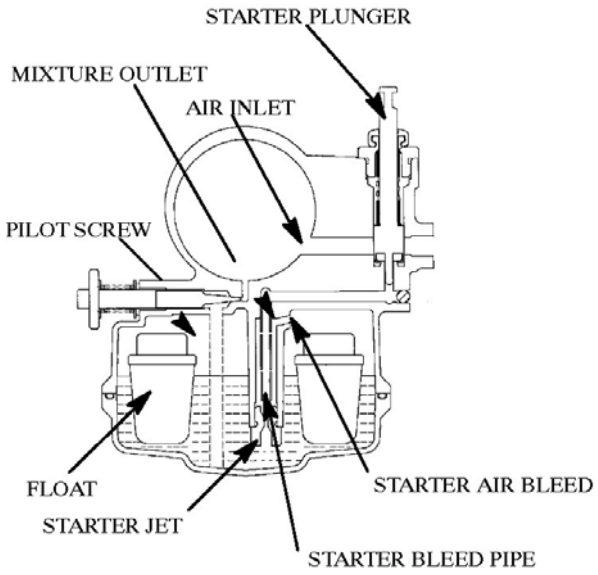
Fuel Screw (G): The fuel screw controls the low speed air/fuel mixture at idle. Turning the fuel screw out makes the mixture richer and can be adjusted up to three turns out.

Float/Needle & Seat Assembly (H): The float/needle & seat are sold as an assembly and cannot be replaced as individual components. The float level is pre-set in the molding and cannot be adjusted.

> **⚠ WARNING**
>
> DO NOT pressurize the fuel system by forcing compressed air through the fuel tank. Forcing air through the needle and seat will cause damage and the float/needle & seat assembly will have to be replaced.

Carburetor Synchronization: Remove the top caps on all carburetors. In the body of the carburetors, there is a Phillips head set screw (I) that connects the slide lever to the throttle lever shaft. The carburetor with the fixed set screw is the base carburetor (middle carburetor on triples, PTO carburetor on twins) and the remaining carbs are synchronized to it. Carburetor synchronization is measured at wide open throttle. Open the throttle to wide open. The bottom of the slide should be flush with the top of the throttle bore. If it is not flush, locate the wide open throttle stop screw (J) and turn it until the base carburetor is set flush. Loosen the Phillips head set screw in the remaining carburetor(s). Turn the adjusting nut (K) that surrounds the set screw until the throttle slide is set the same as the base carburetor. Tighten all set screws and replace the top caps making sure gaskets are properly positioned.

MIKUNI CARBURETOR



Function

The function of a carburetor is to produce a combustible air/fuel mixture by breaking fuel into tiny particles in the form of vapor, to mix the fuel with air in a proper ratio, and to deliver the mixture to the engine. A proper ratio means an ideal air/fuel mixture which can burn without leaving an excess of fuel or air. Whether the proper mixture ratio is maintained or not is the key to efficient engine operation.

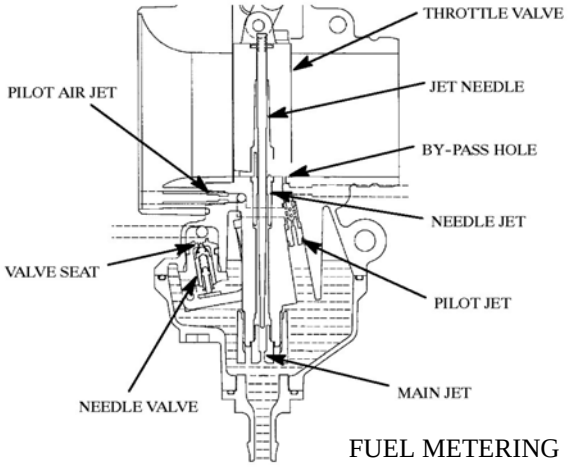
The engine of a vehicle is operated under a wide range of conditions, from idling with the throttle valve remaining almost closed, to full load or maximum output with the throttle valve fully opened. In order to meet the requirements for the proper mixture ratio under these varying conditions, a low speed fuel system, or pilot system, and a main fuel system are provided in Mikuni type carburetors. The Mikuni carburetor has varying operations depending upon varying driving conditions. It is constructed of a float system, pilot system, main system, and starter system or initial starting device.

Float System

The float system is designed to maintain a constant height of gasoline during operation. When the fuel flowing from the fuel pump into the float chamber through the needle valve reaches the constant fuel level, the floats rise. When the buoyancy of the float and the fuel pressure of the fuel pump balance, the needle valve sticks fast to the needle seat, preventing further delivery of gasoline, thereby holding the standard level of gasoline.

The fuel level in the bowl assists in controlling the amount of fuel in the fuel mixture. Too high a level allows more fuel than necessary to leave the nozzle, enriching the mixture. Too low a level results in a leaner mixture, since not enough fuel leaves the nozzle. Therefore, the predetermined fuel level should not be changed arbitrarily.

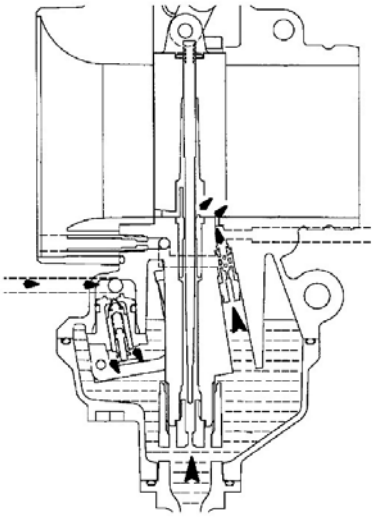
Fuel Metering



FUEL METERING

Mikuni carburetors use a starter enricher system rather than a choke. In this type of carburetor, fuel and air for starting the engine are metered with entirely independent jets. The fuel metered in the starter jet is mixed with air and is broken into tiny particles in the emulsion tube. The mixture then flows into the plunger area, mixes again with air coming from the air intake port for starting and is delivered to the engine through the fuel discharge nozzle in the optimum air/fuel ratio. The starter is opened and closed by means of the starter plunger. The starter type carburetor is constructed to utilize the negative pressure of the inlet pipe, so it is important that the throttle valve is closed when starting the engine

Fuel Delivery



FUEL DELIVERY

The pilot system's main function is to meter fuel at idle and low speed driving. Though its main function is to supply fuel at low speed, it does feed fuel continuously throughout the entire operating range.

Fuel for the pilot jet is drawn from the float bowl, mixed with air jet, and delivered to the engine through the pilot outlet.

The mixture is regulated to some degree by adjusting the fuel screw.

The main system is designed to deliver fuel between low speed and high speed operation. This system is made up of the jet needle, needle jet, and main jet. The main system begins to take effect as soon as there is enough air flow into the carburetor venturi to draw fuel up through the main jet and needle jet assembly. This system works in conjunction with the needle jet system.

During low speed driving, there is very little clearance between the jet needle and the needle jet; therefore, very little fuel from the main jet can pass between the jet needle and the needle jet. As the throttle valve opening is increased, the tapered jet needle is raised farther out of the needle jet, allowing greater fuel flow. Under full throttle opening, the cross sectioned area of clearance between the jet needle and the needle jet becomes greater than the cross sectioned area of the main jet. Thus the main jet is now controlling the amount of fuel flow.

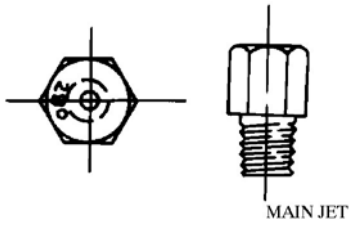
Pilot Jet

From idling to low speeds, the fuel supply is metered by the pilot jet. There are several air bleed openings in the sides of the pilot jet which reduce the fuel to mist. The number stamped on the jet is an indication of the amount of fuel in cc's which passes through the jet during a one minute interval under a given set of conditions.

Fuel Screw

The fuel screw controls the fuel mixture from idle to low speeds. The tapered tip of the fuel screw projects into the passage leading to the by pass out let. By turning the screw in or out, the cross sectional area of the air passage is varied, in turn varying the fuel screw varies the amount of air/fuel.

Main Jet



When the throttle opening becomes greater and the area between the needle jet and jet needle increases, fuel flow is metered by the main jet. The number on the jet indicates the amount of fuel which will pass through it in one minute under controlled conditions. Larger numbers give a greater flow, resulting in a richer mixture. Main jets are screwed directly into the needle jet base.

Jetting Guidelines

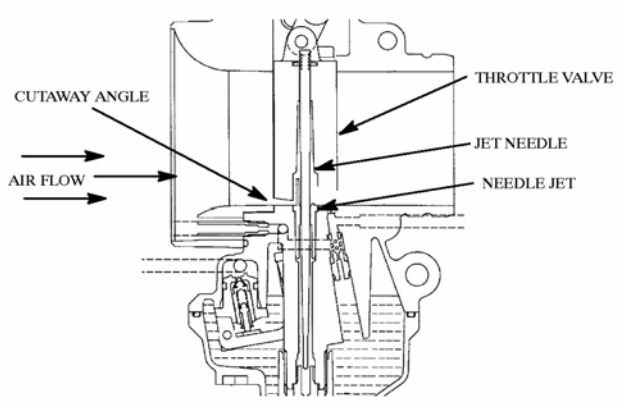
Changes in altitude and temperature affect air density, which is essentially the amount of oxygen available for combustion. In low elevations and cold temperatures, the air has more oxygen. In higher elevations and higher temperatures, the air is less dense.

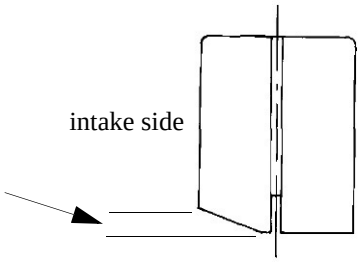
Verify the production setting for your specific model. All carburetors must be re-calibrated if operated outside the production temperature and/or altitude range. The main jet installed in production is not correct for all altitudes and/or temperatures. Refer to the jetting cart in the Specifications Chapter of this manual for correct jetting for altitude/ temperature ranges.

NOTE: It is the owner's responsibility to ensure that the correct jets are installed in the machine for a geographical area. Be very careful when jetting down in warm weather. As the weather turns colder it will be necessary to re-jet upward to prevent engine damage. When selecting the proper main jet always use the lowest elevation and temperature that is likely to be encountered.

> **⚠ CAUTION**
>
> A Main Jet that is too small will cause a lean operation condition and may cause serious engine damage. Jet the carburetors carefully for elevation and temperature according to the jetting charts in the, Specifications Chapter of this manual or the models Owner's Manual Supplements.

Piston Valve Or Throttle Valve





The throttle valve controls the rate of engine air intake by moving up and down inside the main bore. At small throttle openings, air flow control is performed chiefly by the cutaway. By controlling air flow the negative pressure over the needle valve is regulated, in turn varying the fuel flow.

The throttle valves are numbered 1.0, 1.5, 2.0, etc., according to the size of the cutaway in millimeters. The higher the number, the leaner the gasoline/air mixture.

Jet Needle / Needle Jet

The jet needle and needle jet have the most effect between 3/8 and 3/4 throttle opening. Some mixture adjustment can be accomplished by changing the location of the “E” clip on the needle. Moving the clip down raises the needle in the jet passage and enriches the mixture. Moving the clip up lowers the needle in the jet passage and leans the mixture. Letter and number codes are stamped into the needle and the jet indicating sizes and tapers (taper of needles only) of each.

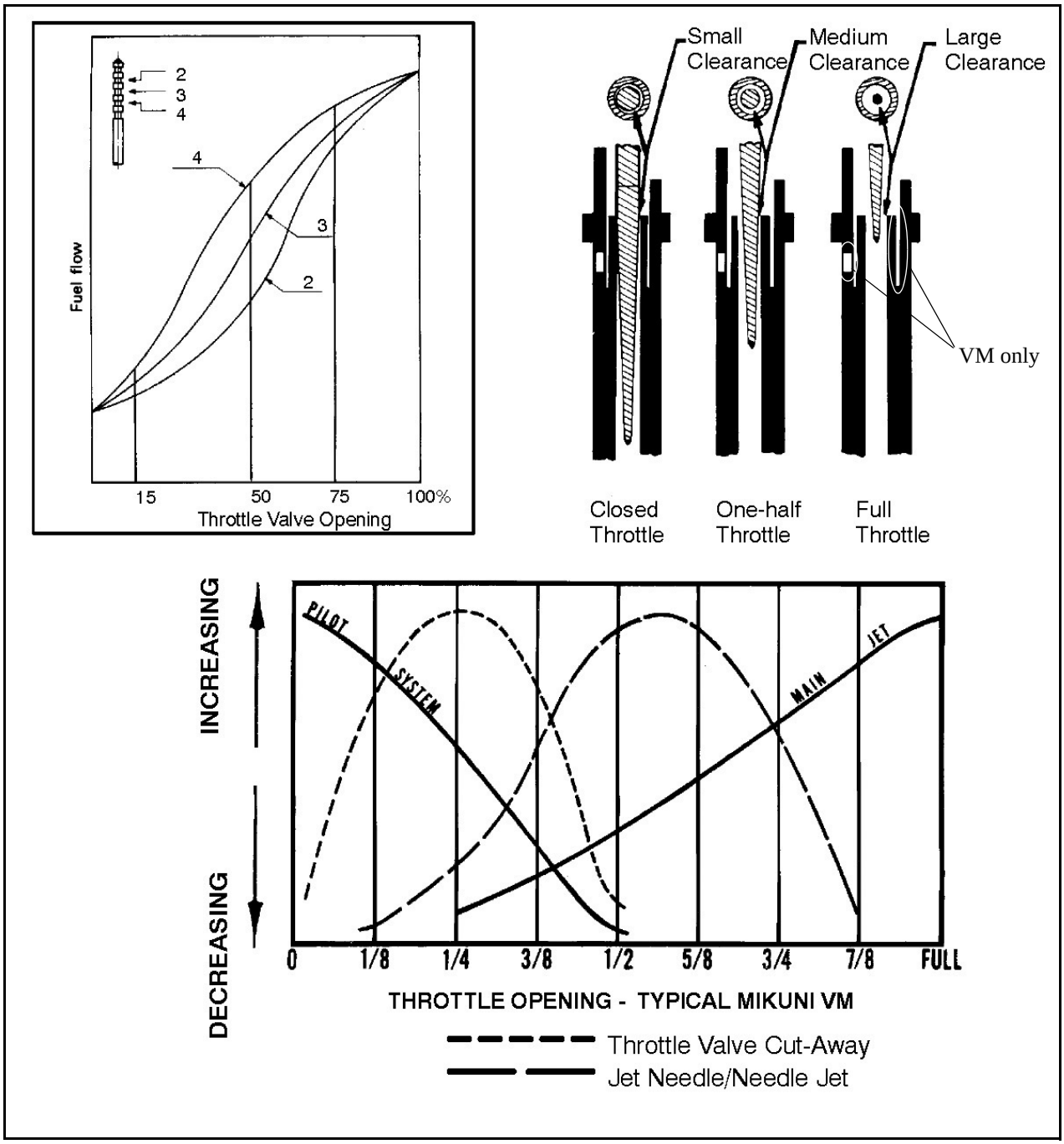
Jet Needle

The jet needle tapers off at one end and the clearance between the jet needle and the needle jet increases as the throttle valve opening gets wider. The air/fuel mixture ratio is controlled by the height of the “E” ring inserted into one of the five slots provided in the head of the jet needle.

Needle Jet

The needle jet works in conjunction with the jet needle.

Throttle Opening Vs. Fuel Flow



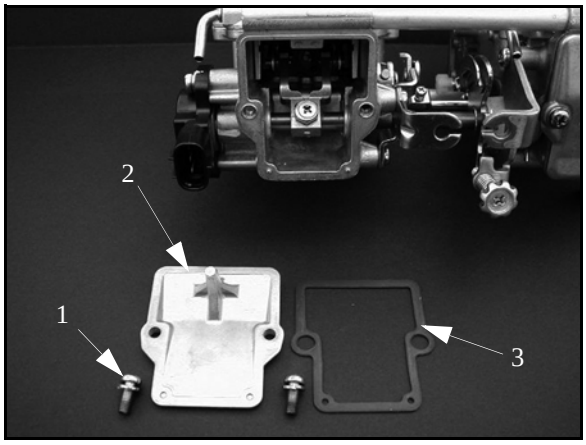
MIKUNI TM38 FLAT SLIDE SERVICE

Disassembly

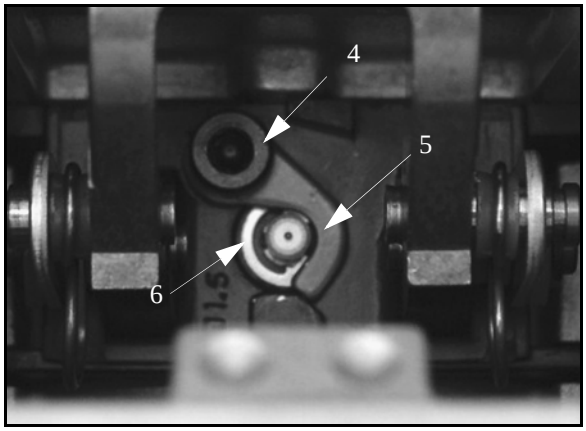
⚠ CAUTION

WEAR EYE PROTECTION WHEN USING COMPRESSED AIR OR WHEN USING CLEANING SOLVENTS. REVIEW ALL FUEL SYSTEM WARNINGS LOCATED AT THE BEGINNING OF THIS CHAPTER BEFORE PROCEEDING.

1. Remove the carburetor from the engine before disassembling. Clean the outside of the carburetor thoroughly with solvent. Do not use compressed air to dry at this time. The float chamber could become pressurized resulting in damage to the floats or inlet needle and seat.
2. Remove all top cap screws (1), top cap (2) and gasket (3).

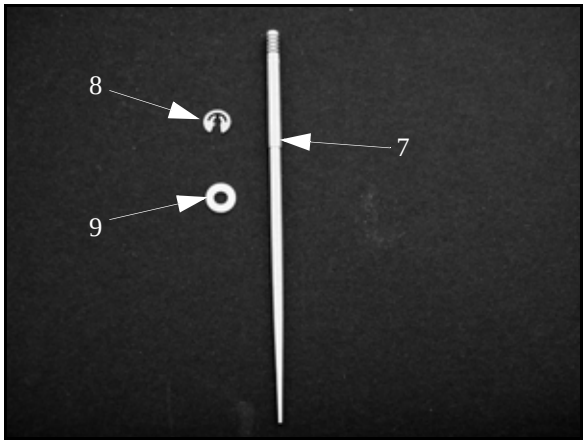


3. Locate the arm screw (4) and loosen it just enough to move the arm (5) out of the way so that you can remove the needle (6) e-clip and the plastic washer from the throttle slide.

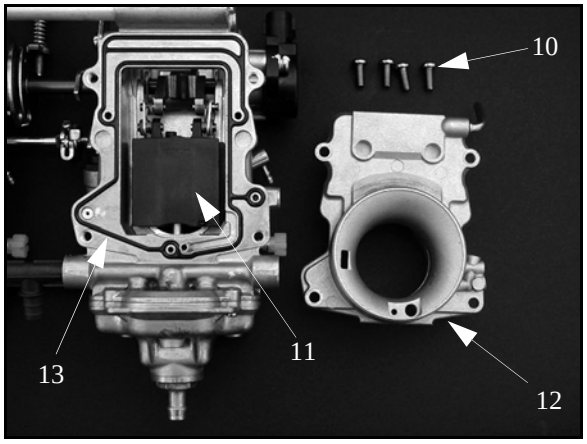


NOTE: Keep track of the plastic washer (9), and place it so it is on the top of the throttle valve when installing the needle and e-ring back into the carburetor.

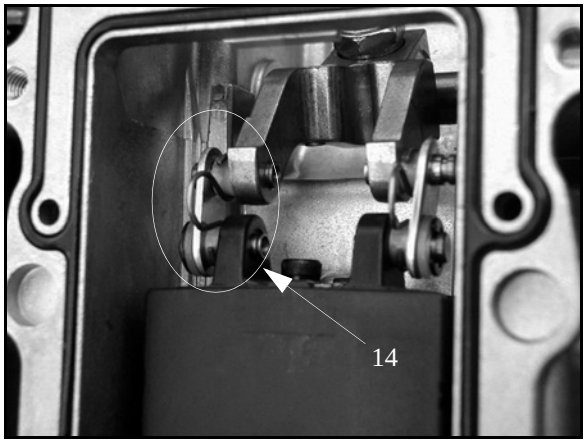
4. Inspect the needle (7), e-clip (8), and plastic washer (9) for wear.



5. Remove the four screws (10) on the funnel face.
6. Turn throttle shaft so the throttle slide (11) slides open all the way.
7. With slide fully open, pull funnel (12) out from the bottom first. Inspect the gasket (13).
8. Check for wear on the faces of the slides.

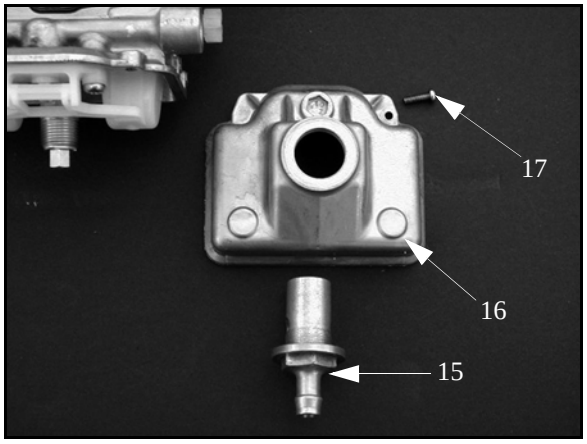


9. Inspect e-rings, plate, spring, and rings (14) connecting the slide to the lever if needed.

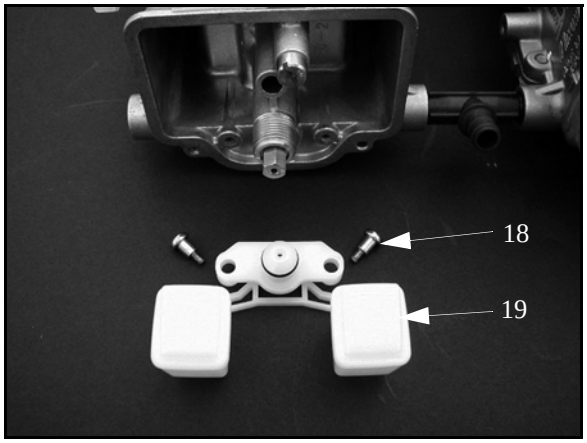


10. Remove water trap/drain plug (15) and single screw (16) on the bottom of the carburetor.
11. Remove and drain the float bowl (17).

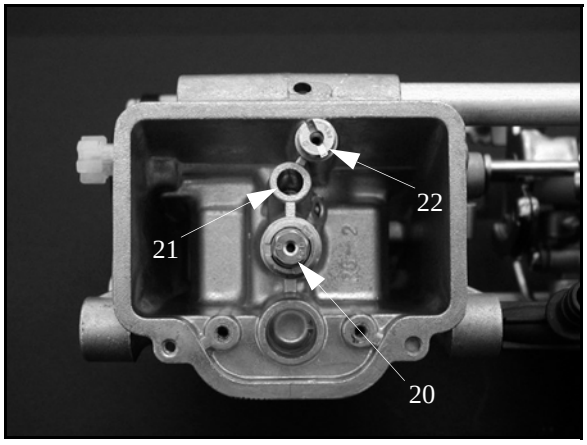
NOTE: Float bowl will not come off unless the water trap/drain plug and screw are removed.



12. Remove the two screws (18) holding the float/needle and seat assembly (19) in position and remove this assembly.
13. Inspect the contents for wear and debris.



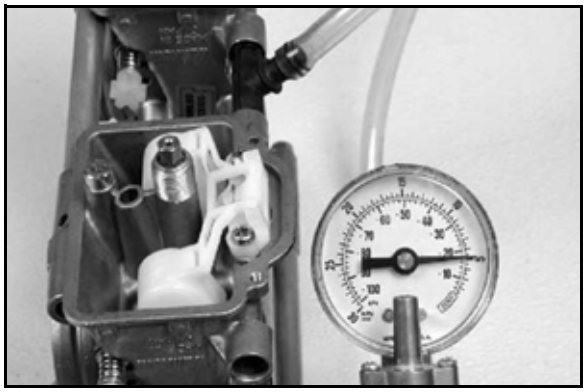
14. Remove and inspect the main jet (20), pilot jet (21), and starter jet (22). Clean them out.
15. Remove the air jet screw if so equipped.



16. Clean out all passages in carburetor body with carburetor cleaner. Dry all passages and jets with compressed air.
17. Replace gaskets and any parts that show wear or damage.
18. Repeat steps 1-18 for disassembly for the other carburetor if needed.

Assembly

1. Install the main jet (20), pilot jet (21), and starter jet (22).
2. Install float/needle & seat assembly (19).
3. Place carburetor in an inverted position.
4. Connect a pressure tester (PN 2870975) to fuel inlet fitting. Apply 5 psi pressure and observe for one minute. The needle and seat should hold pressure indefinitely. If the pressure drops, carefully inspect the needle and the needle seat. The needle can be replaced (needle comes with float and seat).



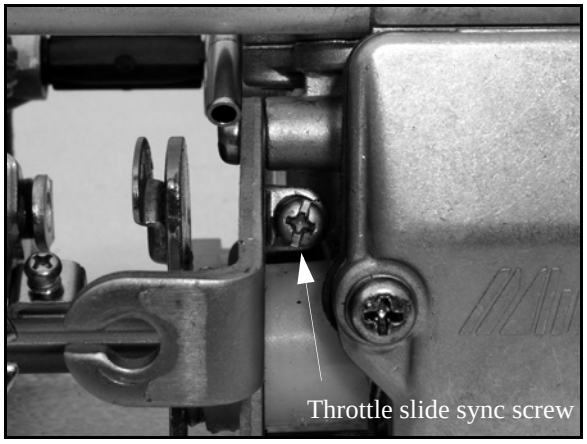
5. Carefully inspect float bowl gasket and replace if necessary.
6. Install float bowl (16) on carburetor with water trap/drain plug (15) and single screw (16) on the bottom of the carburetor.
7. If throttle slide was removed, install throttle slide (11) so that the wider face is facing the engine side of the carburetor.
8. Install the funnel gasket (13) and funnel (12) onto the carburetor. You will have to lift the throttle slide up and place the smaller face into the funnel area.
9. Install funnel screws (10).
10. Install the e-clip (8) in the desired position on the jet needle (7).
11. Slide the plastic washer (9) on the jet needle so that it is positioned to rest on top of the throttle valve when assembled.
12. Install carburetors on engine.
13. Synchronize the carburetors. See “Throttle Valve Synchronization” in this chapter.
14. Replace top cap gaskets (3), cover (2) and screws (1).
15. Check throttle lever free play. See “THROTTLE LEVER FREE PLAY” on page 3.24.

CARBURETOR SYNCRONIZATION

Throttle Valve Synchronization

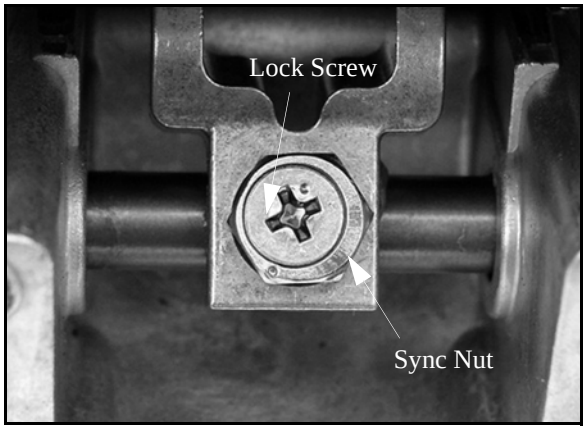
Mikuni TM style carburetors are synchronized at wide open throttle without the engine running. The MAG side carburetor is the adjusting carburetor, the PTO side carburetor has a non adjustable set screw on the throttle shaft. The PTO carburetor is considered the base carburetor. All adjustments are made to the MAG carburetor

1. Remove the air box.
2. Remove the carburetor tops.
3. Hold the throttle wide open with the bell crank on the carburetor.
4. The bottom of the throttle valve should be flush with the top of the carburetor intake area.
5. If they are not flush, hold the PTO carburetor flush with the top of the intake area of the carburetor.
6. Turn the throttle slide synchronization screw until both of the throttle slides are flush with the top of the intake area of the carburetor.



7. Once the PTO carburetor slide is flush, loosen the Phillips head screw, located under the top cover on the MAG carburetor.

8. While holding the PTO carburetor slide flush to the top of the carburetor, rotate the synchronization nut clockwise to raise the slide and counterclockwise to lower the slide.



9. Adjust the synchronization nut until it is even with the PTO slide.
10. Once this is flush, lock the locking screw.
11. Replace the tops of the carburetor.
12. Install carburetor back onto the sled.
13. Install all cables.
14. Install all vent lines, and fuel lines.
15. Check throttle free play.see “THROTTLE LEVER FREE PLAY” on page 3.24.

CARBURETOR COMPONENT PART NUMBERS

Mikuni Pilot Jets

PILOT JET NUMBER	PART NUMBER
25	3130064
30	3130065
35	3130066
40	3130067
45	3130068
50	3130629
55	3130070
60	3130071

Mikuni Main Jets

MAIN JET	PART NUMBER	MAIN JET	PART NUMBER	MAIN JET	PART NUMBER	MAIN JET	PART NUMBER
95	3130102	175	3130118	310	3130134	470	3130147
100	3130103	180	3130119	320	3130135	490	3130148
105	3130104	185	3130120	330	3130136	500	3130149
110	3130105	190	3130121	340	3130137	510 N	3131400
115	3130106	195	3130122	350	3130138	520 N	3131401
120	3130107	200	3130123	360	3130139	530 N	3131402
125	3130108	210	3130124	370	3130290	540 N	3131408
130	3130109	220	3130125	380	3130140	550 N	3131409
135	3130110	230	3130126	390	3130480	560 N	3131410
140	3130111	240	3130127	400	3130141		
145	3130112	250	3130637	410	3130599		
150	3130113	260	3130129	420	3130142		
155	3130114	270	3130130	430	3130143		
160	3130115	280	3130131	440	3130144		
165	3130116	290	3130132	450	3130145		
170	3130117	300	3130133	460	3130146		

Mikuni Jet Needles

JET NEEDLE	PART NUMBER
J8-9FH04-57	3130794
J8-9EH01-57	3130795
J8-9DH01-54	3130796
J8-8BEY01	3131250
J8-9DFH06-57	3131253
J8-9EFH01-60	3131207
J8-9DFH07-60	3131268
J8-9DFH10-57	3131313
J8-9DGI01-60	3131377
J8-9DGJ02-57	3131378
J8-9EFY02-61	3131202

Mikuni Starter Jets

STARTER JET	PART NUMBER
130	3130805
135	3130767
140	3130768
145	3130769
150	3130770
155	3130771
160	3130772

Mikuni (Short) Pilot Air Jets

AIR JET	PART NUMBER
0.5	3130773
0.6	3130774
0.7	3130775
0.8	3130776
0.9	3130777
1.0	3130778
1.1	3130799
1.2	3130780
1.3	3130781
1.4	3130782
1.5	3130783
1.6	3130784
1.7	3130785
1.8	3130786
1.9	3130787
2.0	3130788

Mikuni (Long) Pilot Air Jets

AIR JET	PART NUMBER
0.5	3131255
0.6	3131249
0.7	3131256
0.8	3131254
0.9	3131203
1.0	3131257
1.1	3131258
1.2	3131259
1.3	3131260
1.4	3131261
1.5	3131262
1.6	3131263
1.7	3131264
1.8	3131265
1.9	3131266
2.0	3131267

Mikuni Piston Valves

PISTON VALVE	PART NUMBER
1.5	3130940
2.0	3131252
2.5	3130790
3.0	3130791
3.5	3130792
4.0	3130793

Mikuni (Notched) Piston Valves

PISTON VALVE	PART NUMBER
1.5	3131216
2.0	3131206
2.5	3131217
3.0	3131218
3.5	3131219
4.0	3131220

CLEANFIRE INJECTION (CFI)

Injector Replacement

The Cleanfire system utilizes 3 different color injectors. If you are replacing an injector you must replace it with the same color injector you remove.

The color is indicated in three ways, 1) it will be on the short wire harness that is attached to the injector, 2) the injector will have a colored dot on the shaft of the injector 3)it is indicated on the label of the ECU.

If the color injector is not available you may replace all injectors with a different color and you must program the ECU to run the new installed color.

INJECTOR	COLOR
1202853-053	Yellow
1202853-027	Blue
1202853-015	Red
INJECTOR KITS	**COLOR**
2203325-053	Yellow
2203325-027	Blue
2203325-015	Red

If it is verified that an injector needs to be replaced, you must first find out what injector color is on the unit. You can do this by checking the decal that is located on the top portion of the ECU or by the color band that is next to the injector on the harness.

1. Bleed the fuel rail. See “Fuel Rail Bleeding” on page 4.20.
2. Remove the seat and fuel tank. See “IQ Fuel Tank Removal” on page 10.6.
3. If removal of the engine is needed. See “600/700 CFI Engine Removal” on page 5.29.
4. Replace the injectors.
5. Install engine. See “600/700 CFI Engine Installation” on page 5.35.
6. Re-flash ECU with Digital Wrench.
7. Test run.

600/700 CFI Injector Replacement

If an injector is suspect to failure please use the following procedure to replace injector(s) on the CFI engine.

Using Digital Wrench, identify which injector needs to be replaced.

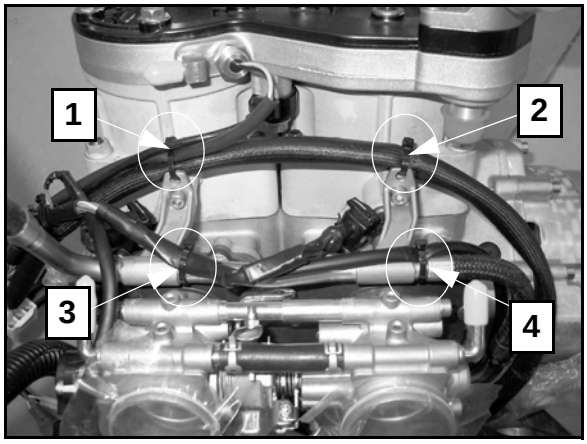
NOTE: If the injector is on the upper fuel rail, only the air box needs to be removed to gain access to the failed injector.

NOTE: If the injector is on the lower fuel rail, engine removal is necessary for injector access. See “600 / 700 HO CFI ENGINE” on page 5.29.

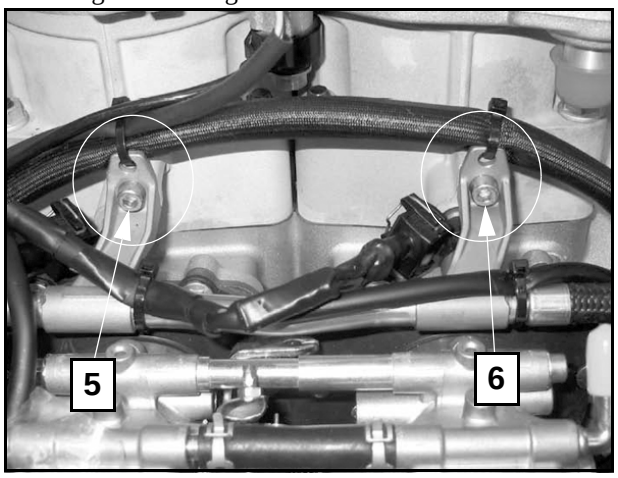
600/700 CFI Fuel Rail/Injector(s) Removal/ Installation

NOTE: When installing replacement injector(s) keep the red protective cap on the end of the injector to prevent damage when installed. Follow the steps and remove when instructed to do so.

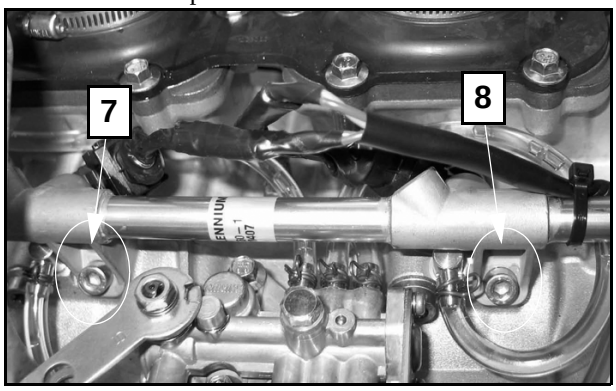
1. Depressurize the fuel rail. See “Fuel Rail Bleeding” on page 4.20.
2. Remove the panduit straps (1-4) as shown.



3. Remove the fuel rail by taking out the two hex bolts (5,6) holding it to the engine.

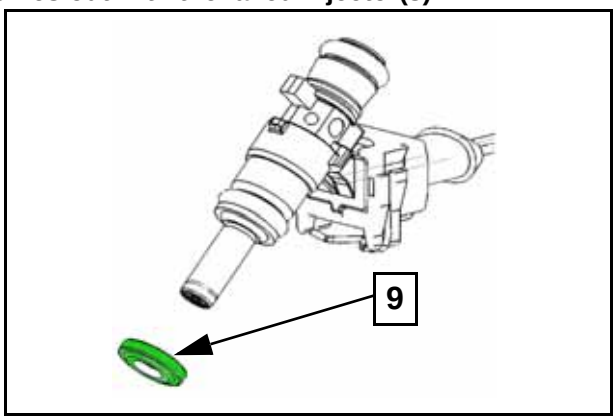


4. If replacing a lower injector, remove the lower two bolts from the lower part of the fuel rail.

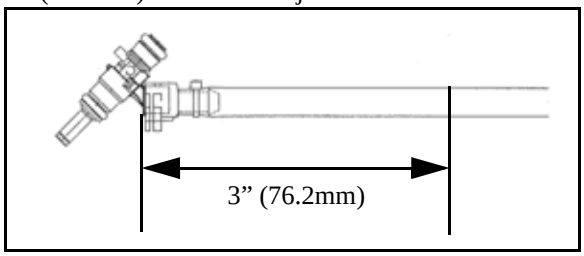


5. Remove the failed injector(s).

NOTE: Make sure that the green rubber washer (9) comes out with the failed injector(s).

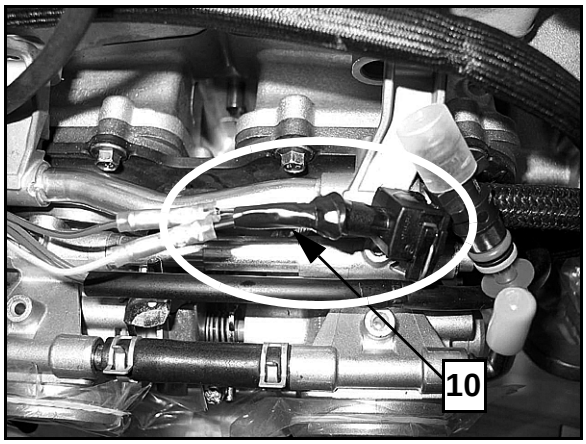


6. Measure from the end of the injector (as shown below) 3" (76.2mm) and cut the injector off.

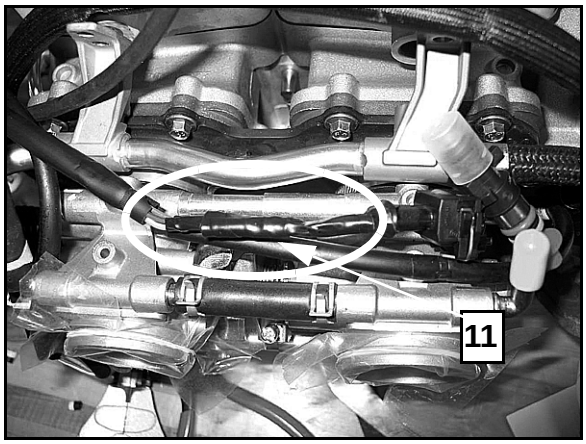


7. Strip the harness end injector wire covering .25" - .375" (6.35 - 9.525mm).

8. Crimp the ends of the new injector firmly on to the wire harness (10).



9. Tape exposed wire and splices (11).



10. Apply 2-stroke oil to the fuel injector o-rings, seal and mating surfaces (fuel rail & case sides).
11. Insert the fuel rail, with injectors back onto the engine.
12. Apply a light amount of 262 Loctite® to the fuel rail fasteners and torque to specification.

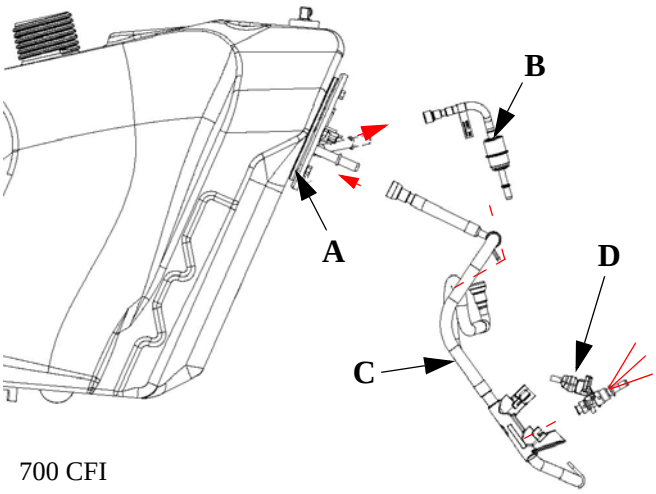
= T
Fuel Rail Hex Bolt Torque: 9 ft-lb (12N-m)

13. Replace the harness to the original routing and apply panduit straps back to the original locations, making sure they are not applied over any mesh part of the fuel rail.

NOTE: Refer to Step 2 for proper routing and strap location.

14. Install the engine if it was removed. See “600 / 700 HO CFI ENGINE” on page 5.29.
15. If different color injectors were installed you will need to re-flash the ECU to accept the new colors.
16. Clear all codes with Digital Wrench.

Cleanfire System Overview



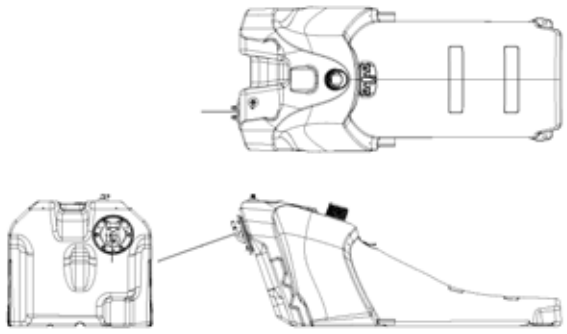
700 CFI

The Cleanfire fuel system uses a fuel pump (A) that is located inside the fuel tank, a fuel rail (C) with in-line fuel filter (B), and injectors (D). The fuel pump will create a pressure in the system and deliver the fuel mixture to the injectors. The injectors get a signal from the engine controller unit (ECU) and sprays into the engine.

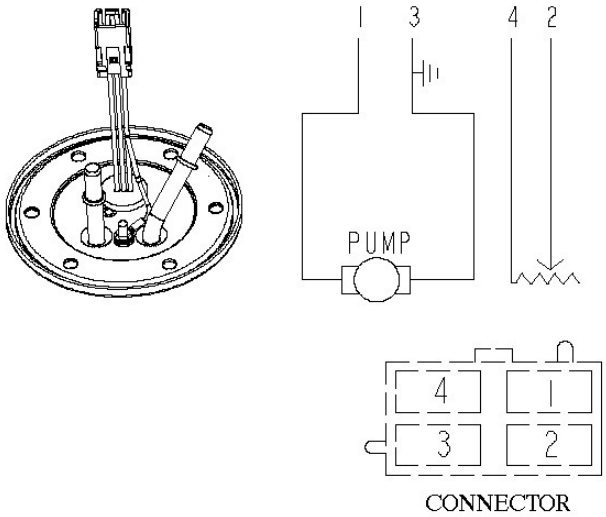
The only maintenance that is needed with this system is that the fuel filter (B) needs to be changed every 1,000 miles (1600km).

Fittings should be inspected for cracks or leaks. Do not use pliers or other tools that may damage fuel lines when installing or removing fuel rail.

Fuel travels from the fuel pump through the fuel filter and to the injectors. Any fuel that is not delivered through the injectors will travel back to the fuel tank through the return line.



Fuel Pump (700)



This fuel pump on this system is non-serviceable and can not be replaced. If fuel pump fails, the whole fuel tank assembly must be replaced.

FUEL PUMP: Located inside tank. It provides system with fuel at 58psi (4bar) pressure. If the fuel pressure is suspect to be defective apply 12 VDC to the fuel pump prime (Red (#1) and the Brown (#3) wires) and check for audible fuel pump operation as well as fuel rail pressure. The fuel pump should sound when pumping and the pressure should show 58psi (4 bar) pressure.

PIN	COLOR	ITEM
#1	Red	power to the pump
#2	Violet/White	fuel level signal
#3	Brown	ground
#4	Brown	fuel level ground

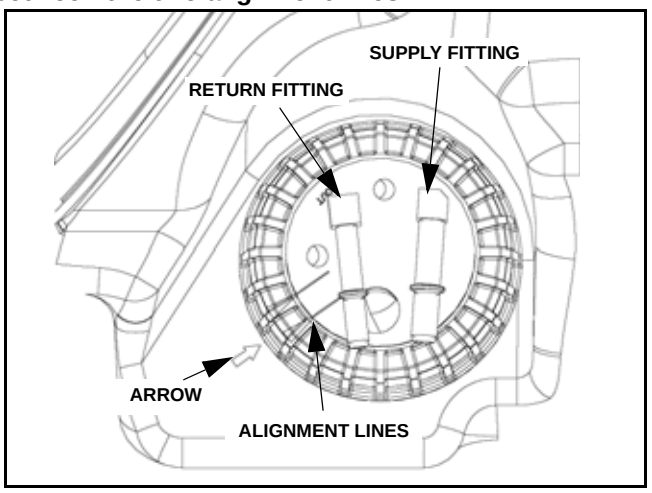
Fuel Level Indicator

If the fuel gauge is suspect to failure you can check the continuity from the fuel sender to the gauge. The given resistance below is from the Violet/White (#2) wire to the Brown (#4) wire located at the front of the fuel pump.

TANK LEVEL	RESISTANCE (Ω)
FULL	2 - 4 Ω
EMPTY	85 - 95 Ω

2007 Fuel Supply / Return Fittings

NOTE: Align pump flange so that the arrow is between the two alignment lines.



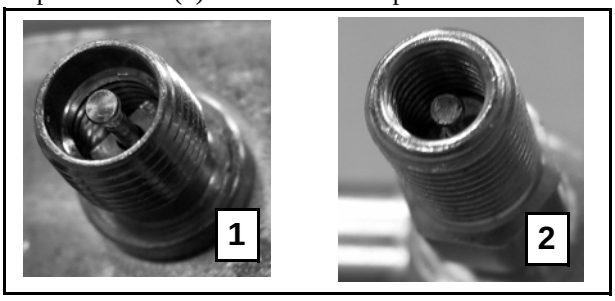
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PFA Nut Torque 21 Ft.Lb. (28 Nm)

Fuel Rail Bleeding

The 2007 600 CFI units will have one of two different styles of Schrader valves.

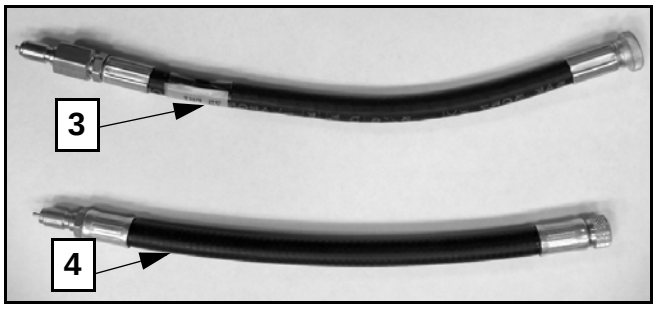
A shallow core valve (1) and will use the adapter that comes with the fuel pressure gauge (PN PV-43506-A).

A deep core valve (2) will need the adapter PN PS-48167.



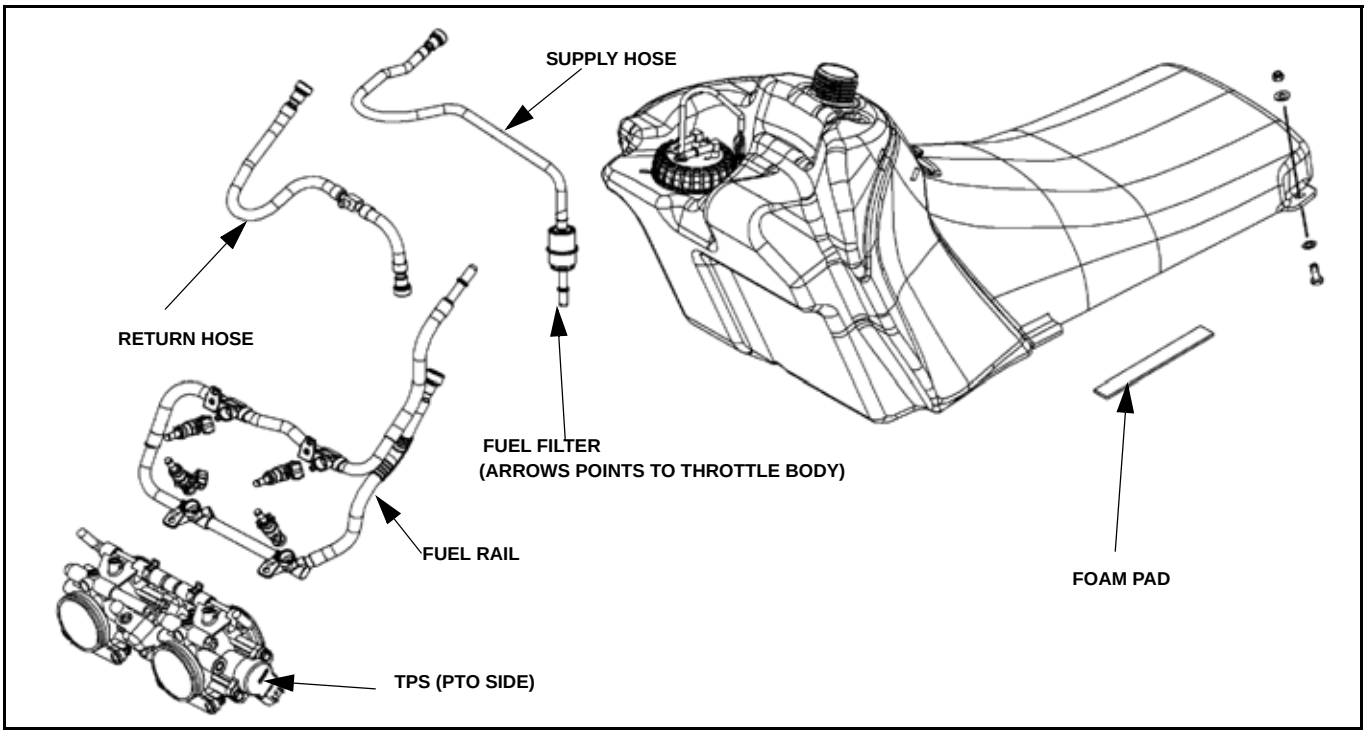
The fuel pressure gauge (PN PV-43506-A) is used to check or bleed the pressure in the fuel rail lines. You will need to bleed off the fuel pressure if any service is needed to the fuel system or if engine is to be removed.

1. Select the appropriate adapter for your valve type.
   - Adapter (3) is used on the shallow core valve.
   - Adapter (4) is used on the deep core valve.



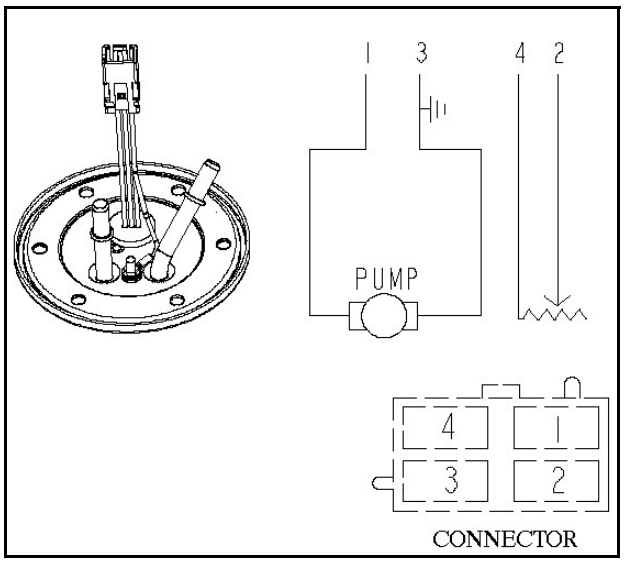
2. Attach the correct gauge to the valve on the fuel pressure tool.
3. Once the gauge is onto the Schrader valve, the pressure gauge will indicate the pressure in the fuel rail.
4. To bleed the pressure from the fuel rail, you can turn the bleeder valve on the gauge and bleed the system safely.
5. At this point the fuel rail is ready for service.

600 CFI Fuel Tank / Fuel Supply



600 CFI Pump / Sender Specifications

	Ω	PINS	COLOR	FUNCTION
Full	≤ 8 ±1	1	Red	Pump PWR
1/2	40 +/-3	2	WHT/BLU	Sender
Empty	85 +/- 4	3	Black	Ground
		4	Pink/Black	Sender



600 CFI Fuel Pump Replacement

⚠ WARNING

Only the 2007 600 CFI models use the drop-in style fuel pump.

1. Siphon the fuel out of the fuel tank into a suitable container.
2. Remove the console and the seat assembly.
3. Disconnect the positive (+) battery cable from the battery if applicable.
4. Remove the fasteners securing the fuel tank to the tunnel.
5. Bleed the pressure from the fuel rail. See “Fuel Rail Bleeding” on page 4.20.
6. Lift and move the tank back to gain access to the fuel lines.
7. Remove the fuel supply and return hoses from the top of the tank.
8. Disconnect the wiring harness, then remove the tank from the snowmobile. Place tank in a well-ventilated area.

9. Using the PFA spanner wrench (PS-48459-1) and nut socket (PS-48459), carefully remove the PFA nut.



10. Carefully extract the PFA out of the tank making sure the float and fuel hoses do not become kinked or bent.
11. Remove the old gasket and destroy.

⚠ WARNING

Never re-use a used PFA gasket.

12. Clean the tank's gasket mating surface with Isopropyl Alcohol. Allow the surface to dry completely.
13. Install a new gasket ensuring the inside portion of the gasket hooks onto the bead on the inside diameter of the neck.
14. Remove any containments from the gasket with Isopropyl Alcohol.
15. Carefully place the PFA back into the tank. Push the float assembly against the hoses to fit it into the hole.
16. Hand tighten the PFA nut keeping the arrow between the PFA alignment marks.
17. Using the PFA spanner wrench and nut socket (PS48459-1 and -2), tighten the PFA to specification.

= T

PFA Nut Torque = 21 Ft.Lbs. (28 Nm)

18. Fuel tank installation is the reverse of removal. Always test the PFA gasket seal before tank installation by performing a pressure check.

Fuel Tank Pressure Test

1. Connect a Mity Vac hand pump to the fuel tank vent fitting. Seal the fuel supply and return fittings.
2. Pressurize the tank to 5 PSI.

⚠ WARNING

Do not over-pressurize the fuel tank past 6 PSI.

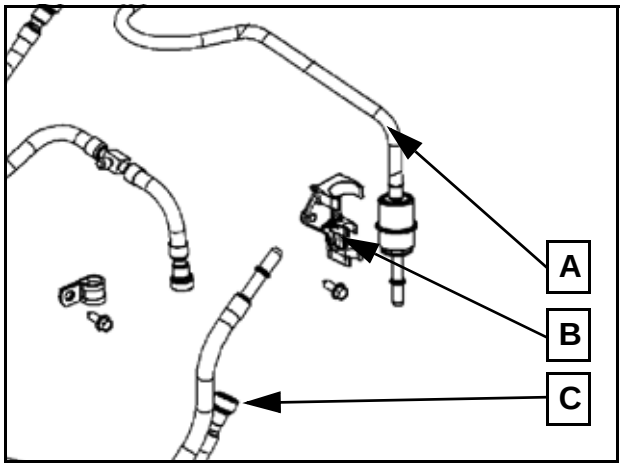
NOTE: Using a hand pump to pressurize the fuel tank may take a very long time. The installation of an in-line Schrader Valve (PN: 2872602) and the use of a low pressure pump (bicycle tire pump) is recommended.

3. Once the tank is pressurized, spray the area around the PFA gasket with a mixture of water and mild detergent.
4. If any bubbles form, re-check the PFA nut torque. If bubble formation continues, the PFA gasket will have to be replaced, or tank replacement is required.

Throttle Body Removal

1. Remove the air box.
2. Remove the throttle body air box adapter.
3. Pinch off the coolant lines with the hose pincher tool PN PU-45149.
4. Remove the coolant lines from the throttle body.
5. Loosen the intake boot clamps and pull the throttle body upward, enough to gain access to the throttle cable and TPS connector.
6. Loosen the throttle cable lock nut and remove the cable from the throttle body.
7. Disconnect the TPS from the throttle body.
8. Remove throttle body.

Fuel Filter Removal



1. Carefully remove the fuel filter (A) from the bracket (B).
2. Using the 3/8” fuel line disconnection tool remove the fuel line (C) from the fuel filter.
3. Using the fuel line disconnection tool remove the filter line from the fuel sender.
4. Remove the fuel filter.

Fuel Filter Installation

1. Dip the male end of the fuel filter line in 30w engine oil.
2. Snap the male end into the fuel line (C).
3. Connect the fuel filter end onto the fuel sender.
4. Snap the filter (B) into the fuel filter holder (A).

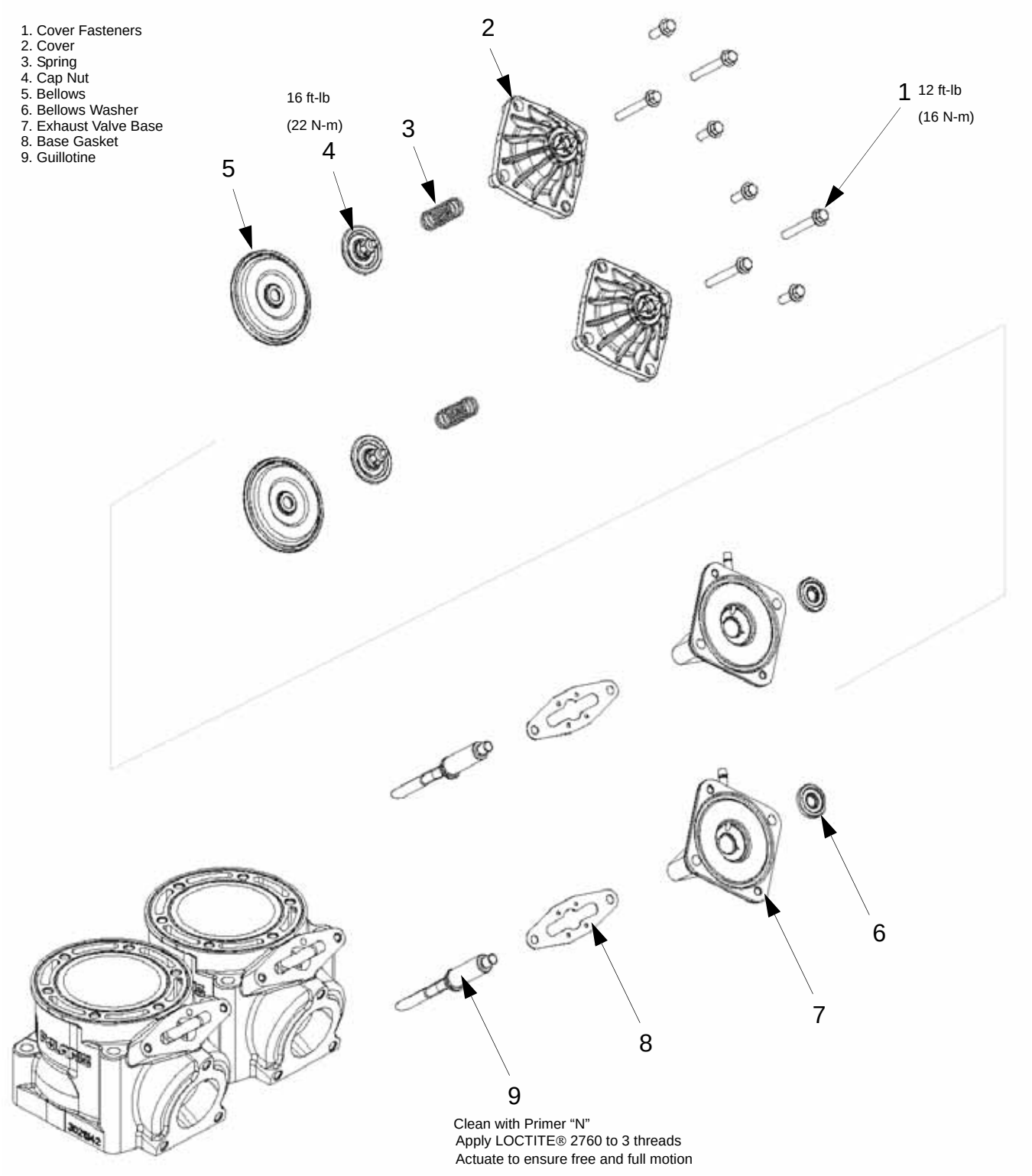
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GENERAL ENGINE INFORMATION

Exhaust Valve Exploded View



Exhaust Valve Disassembly

CAUTION

EV spring under tension. Use care when removing housing from assembly base.

1. Remove the vent lines from the exhaust valve base(s).
2. Remove the four cover fasteners (1) securing housing and the valve assembly onto the cylinder.
3. Remove exhaust valve assembly from cylinder.
4. Remove the exhaust valve base gasket(s) (8) and discard.
5. To remove the guillotine (9), secure the guillotine, then apply heat to remove the bellows retaining nut cap nut (4).
6. Separate the cap nut, bellows (5) and bellows washer (6) from the guillotine.
7. Remove the guillotine from the base (7).

Exhaust Valve Assembly

1. Clean the threads of the guillotine with Primer N.
2. Insert the base (7) into the clean guillotine (9).
3. Apply Loctite 242 to first 3 threads on the guillotine.
4. Place the bellows washer (6), bellows (5) and cap nut (4) onto the guillotine.
5. Torque the cap nut(s) to 16 ft-lb (22 N-m).

= T

Guillotine Cap Nut Torque: 16ft.lb. (22 N-m)

6. Lubricate the guillotine blade and shaft with engine oil.
7. Actuate the guillotine to ensure full and free motion.
8. Install the spring, and cover.
9. Torque the cover/base fasteners to 12 ft-lb (16 N-m).

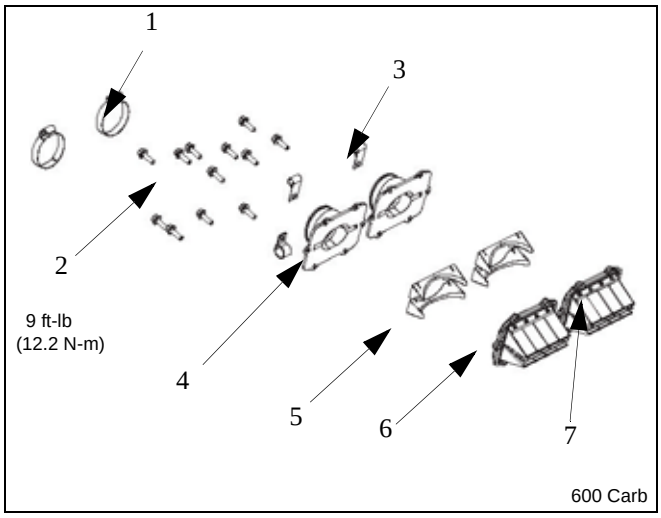
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Cover/Base Fastener Torque: 12 ft.lb. (16 N-m)

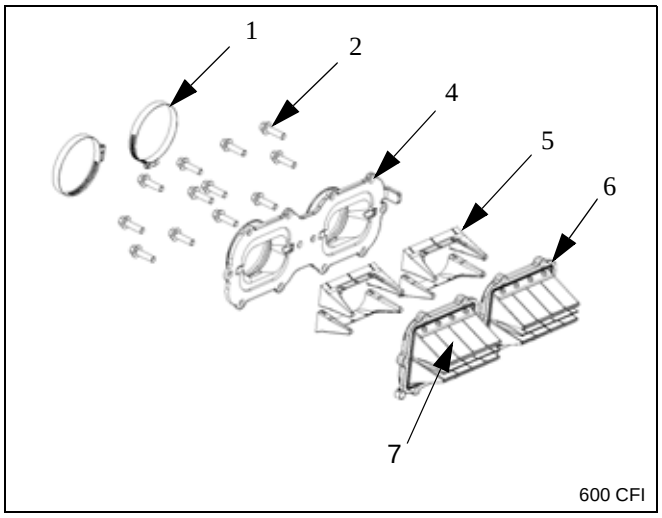
Optional Exhaust Valve Springs

SPRING #	COLOR	FREE LENGTH
7041704-01	Blue	1.752
7041704-02	Orange	1.729
7041704-03	Pink	1.734
7041704-04	Purple	1.726
7041704-05	Yellow	1.734
7041704-06	White	1.537

Reed Valve Disassembly



600 Carb

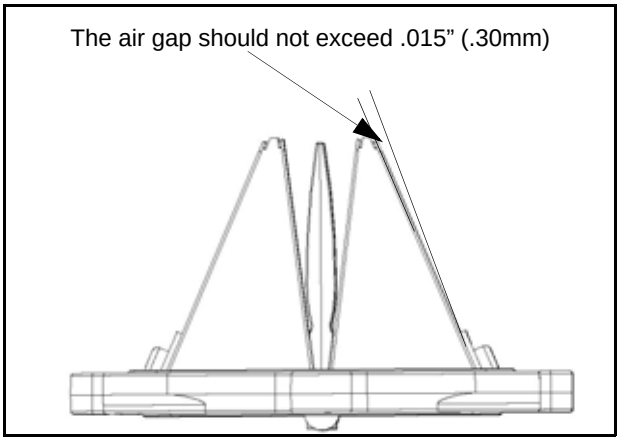


600 CFI

1. Loosen up the hose clamps (1)
2. Remove the carburetor(s) or the throttle body from the intake boots (4).
3. Remove the intake boot fasteners (2) and hose holders (3) (if applicable).
4. Remove the intake assembly (4-7).

5. Separate the intake boot(s) (4) from the reed cage (6)
6. If reed stuffers are used separate the reed stuffer(s) (5) from the reed cage (6) and inspect the reeds (7) before they are removed from the reed cage.

NOTE: Measure the air gap between the fiber reed and the reed block. The air gap should not exceed .015" (.38mm). If clearance is excessive DO NOT attempt to reverse the reeds to reduce the air gap. Always replace them if damaged or worn. Check each fiber reed for white stress marks or missing material.

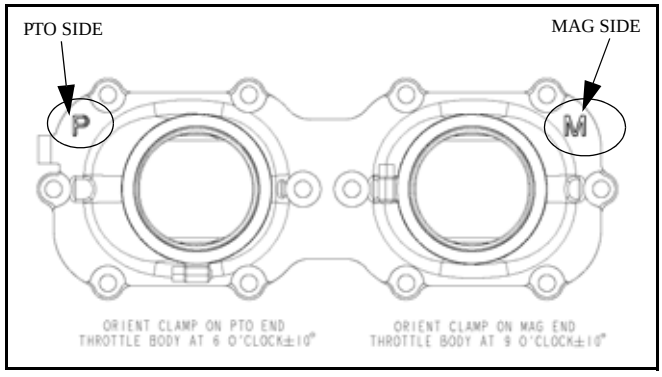


7. If damaged remove and replace the reeds (7) on the reed cage (6).

Reed Valve Assembly

1. If reeds (7) were replaced or removed, assemble the reeds to the reed cage (6).
2. Place the assembled reed cage (6-7) into the engine case.
3. Insert the reed stuffers (5) into the reed cage.
4. Place the intake boot(s) (4) onto the installed reed cage.

NOTE: 600/700 CFI engines must have the boots placed onto the case in the correct orientation. The boot has a “P” for PTO side and “M” for MAG.



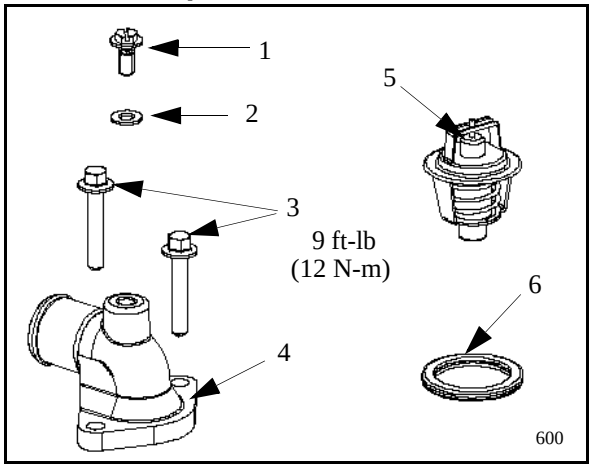
5. If applicable replace the hose guide(s) (3) in the appropriate places.
6. Insert the intake boot fasteners (2) and torque to 9 ft-lb (12 N-m).

= T
Intake Boot Fasteners: 9 ft-lb (12 N-m)

7. Install the carburetors or throttle body and torque the hose clamps (1) to 11 in-lb (1 N-m).

= T
Carburetor/Throttle Body Fasteners: 11 in-lb (1N-m)

Thermostat Replacement

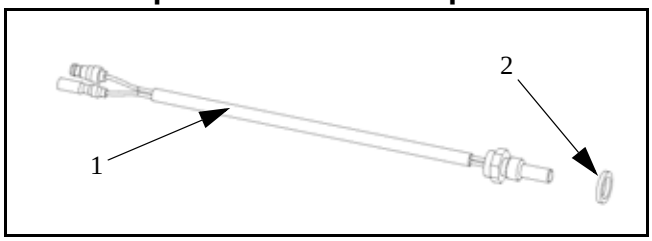


1. Remove the thermostat cover, by removing the cover bolts (3).
2. Check the o-ring (6) condition and replace it if it is damaged.
3. Replace the thermostat (5). Make sure that the spring side is facing downward or toward the engine.
4. Replace cover (4) onto the thermostat.
5. Torque the cover fasteners (3) to 9 ft-lb (12 N-m).

= T
Cover Fasteners: 9 ft-lb (12 N-m)

6. Make sure that the bleed screw (1) and washer (2) is installed.

Water Temperature Sensor Replacement



1. Remove the sensor (1) from the cylinder head.
2. Replace the washer (2) and torque the sensor to specification.

= T
Temperature Sensor: 18 ft-lb (24 N-m)

Engine Mount Replacement

1. Use the correct Engine Mount Socket (PN PS-45384 or 2871989).
2. Replace the old motor mount if necessary with new and torque new motor mount to specification.

= T
28 ft.lb (37.9 N-m)

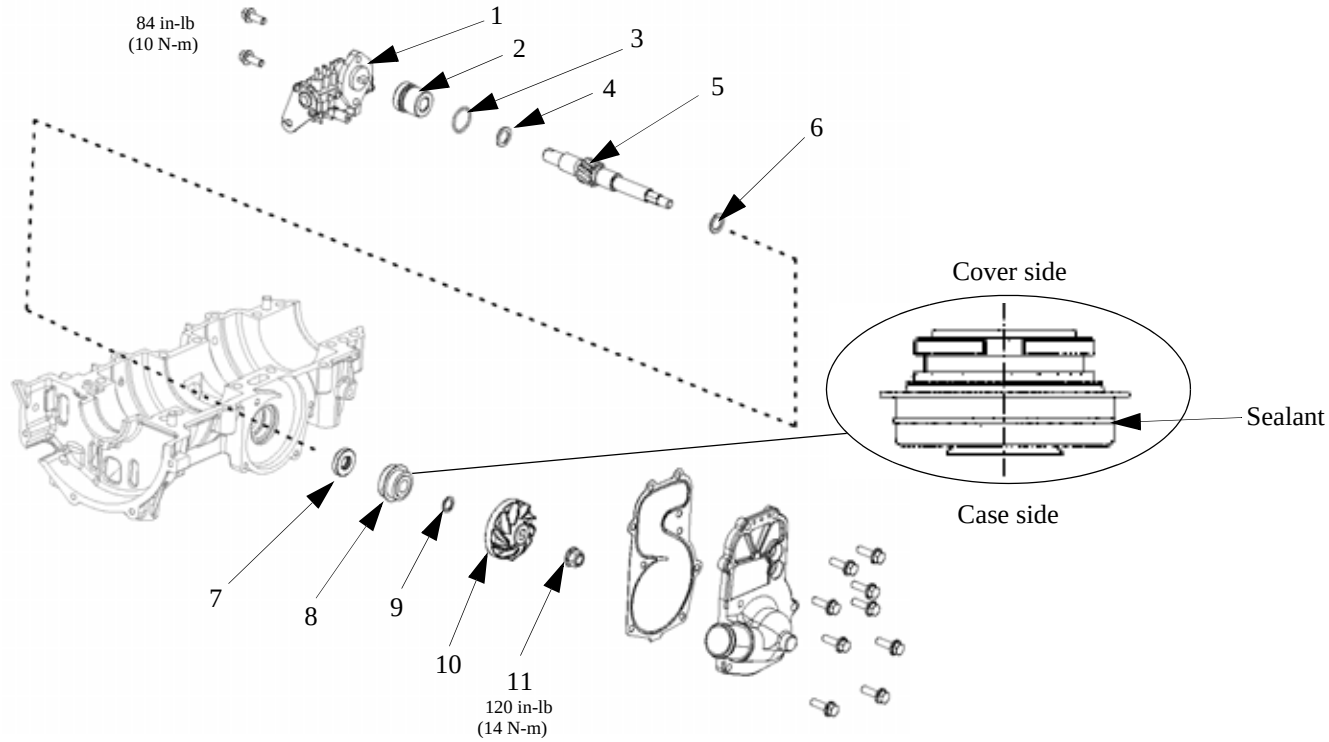
Cylinder Stud Installation

If you are replacing the crankcase on the 500, 600 HO, 600 CFI or 700 CFI Liberty engines, the new cases will come with the cylinder studs not installed, you will need to assemble the cylinder studs to a determined length.

You will need to thread in the Dri-Lok treated portion of the stud into the case to a determined length below. After stud assembly remove the Dri-Lok residue from the case assembly before assembly.

= In. / mm.	
600 CFI 700 CFI	Long Studs Height (Exhaust side) = 4.13" (105mm) Small Stud Height (Intake side) = 2.16" (55mm)
500/600 HO	Long Studs Height (Exhaust side) = 3.66" (93mm) Small Stud Height (Intake side) = 2.16" (55mm)

500/600/700 Water/Oil Pump Cross Shaft Disassembly



NOTE: Inspect all parts for wear or damage during disassembly. Replace all seals, o-rings, and gaskets with Genuine Pure Polaris parts during assembly. Refer General chapter for general inspection procedures.

1. Remove the oil pump (1).
2. Carefully pull out the brass bushing (2) and o-ring (3).
3. Remove the water cover fasteners.
4. Remove the cover and gasket.
5. Remove the impeller nut (11).
6. Remove the impeller (10) and flat washer (9).
7. Remove the mechanical seal (8).
8. Pry out the seal (7) that is behind the mechanical seal.
9. Press out the water pump shaft (5) out toward the oil pump side.
10. Remove the thrust washers from the cross shaft (4, 6).

500/600/700 Water/Oil Pump Cross Shaft Assembly

1. Install the seal (7) so that the spring side is facing the intake side of the case and press it in so that it is bottomed out in the case.
2. Install the mechanical seal (8) into the case with the sealant facing the intake side of the engine. Use the Seal Installation Tool PN 2872010.

IMPORTANT: It is very critical to use the Installation tool PN 2872010 to set the operating height of the mechanical seal. Failure to do so will cause seal to leak.

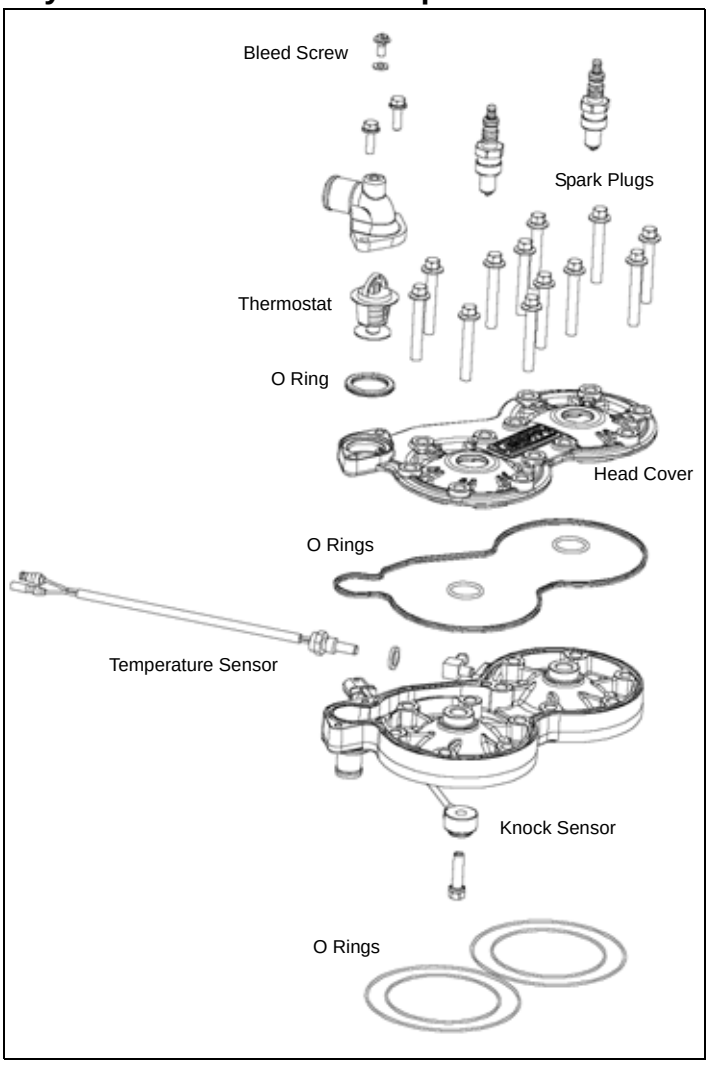
3. Install the thrust washers (4, 6) on to the cross shaft.
4. Install the O-ring (3) on the cross shaft.
5. Install the flanged pump bearing (2) onto the cross shaft.
6. Install oil pump (1) onto the crankcase and torque the bolts to 84 in-lb (31 N-m).

= T
Oil Pump Fasteners: 84 in-lb (10 N-m)

7. Place the impeller washer (9), impeller (10) and impeller nut (13) onto the other side of the cross shaft.
8. Torque the impeller nut (13) to 120 in-lb (14 N-m).

= T
Impeller Nut: 120 in-lb (14 N-m)

Cylinder Head / Head Components



Cylinder Head Disassembly

1. Remove enough engine coolant so that no coolant remains in the cylinder head.
2. Remove the airbox, electrical, and ignition components from the cylinder head.
3. Remove the cooling hoses from the thermostat and throttle body circuit fittings.
4. Evenly loosen the cylinder head screws. Always clean the screw threads as they are removed.

NOTE: The thermostat cover screws only require removal when access to the thermostat is desired.

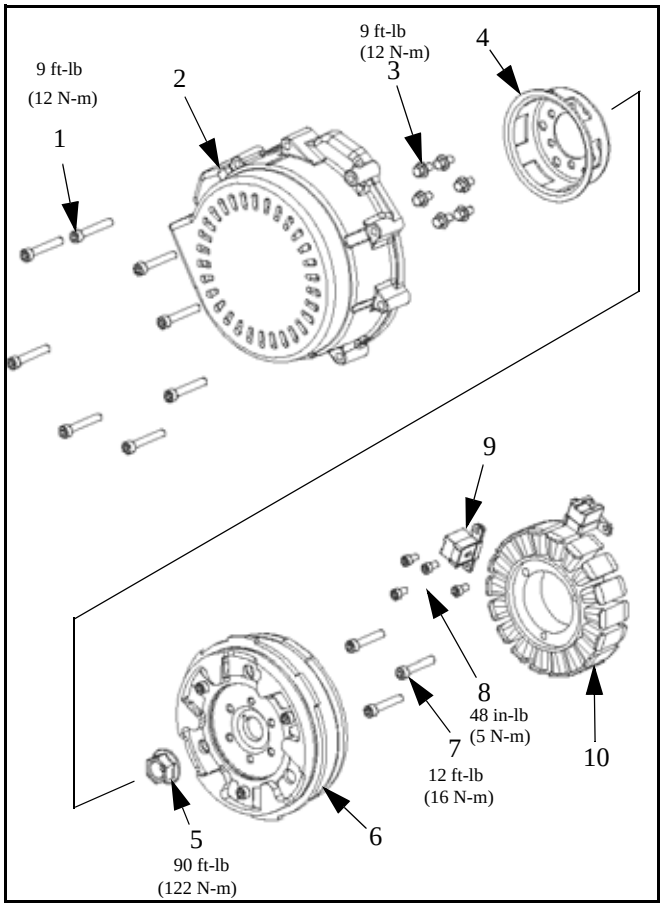
5. Lift the head cover and cylinder head assembly up and off of the cylinders.
6. Discard original o-rings. Never re-use o-rings.
7. If engine coolant spilled into the cylinder(s), wipe each cylinder dry with a clean shop rag or paper towel. If unsure how much coolant spilled into cylinders and crankcase, locate the two crankcase drain screws located on the front, lower crankcase halve. 600/700 CFI drains are located on the bottom of the crankcase and the engine would have to be removed.
8. Remove each screw to allow the coolant to drain out of the engine.

Cylinder Head Assembly

1. Cylinder head assembly is the reverse of disassembly with the addition of these notes:

   - Always use new o-rings.
   - Inspect the cylinder bores, combustion chamber domes, piston faces and head cooling passages for damage or foreign material. Resolve any issues prior to re-assembly.
   - Follow the cylinder head torque specifications and torque sequence illustrations found at beginning of chapter.

Recoil/Stator Removal



1. Remove the recoil cover bolts (1).
2. Remove the recoil assembly (2).

3. Remove the recoil basket bolts (3).
4. Remove the recoil basket (4).
5. Using a strap wrench PN PU-45419 hold the flywheel (6) while taking the flywheel nut (5) off.
6. Using the Flywheel Puller PN 2871043, thread the puller bolts into the flywheel. Do not install puller bolts more than 5/16" (7mm) into flywheel threads or stator damage may result.
7. Tighten the center bolt and remove the flywheel (6).
8. Note the ignition timing marks that match up with the stator to the crankcase or scribe additional marks for reference for assembly.
9. Remove the stator bolts (7)
10. Remove the pulse coil fasteners (8).
11. Remove the pulse coils (9) and stator (10). Be careful when removing the wires of the stator.

Recoil/Stator Assembly

NOTE: Inspect all parts for wear or damage during disassembly. Replace all seals, o-rings, and gaskets with Genuine Pure Polaris parts during assembly. Refer General chapter for general inspection procedures.

1. Install the stator (10) and the pulse coils (9).
2. Install the pulse coil fasteners into the case and torque to specification.

= T
Pulse Coil Fasteners: 48 in-lb (5 N-m)

3. Install the stator bolts (7) and torque to specification.

= T
Stator Fasteners: 12 ft-lb (16 N-m)

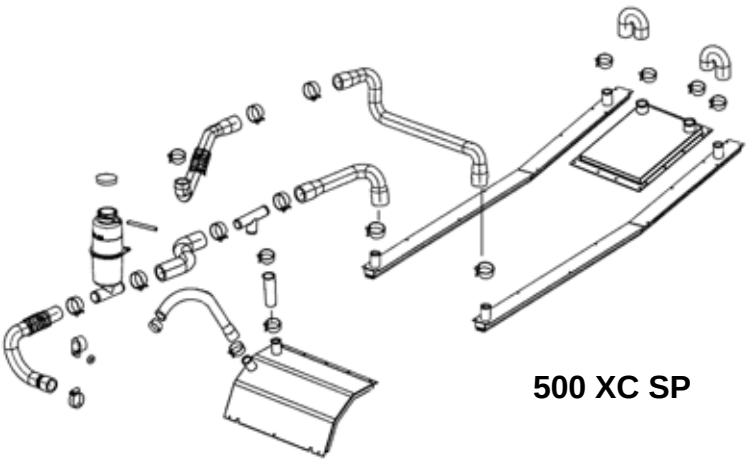
4. Install the flywheel (6) so that it matches up with the index of the woodruff key.
5. Apply Loctite 242 to the threads of the flywheel nut (5) and onto the end of the crankshaft.
6. Holding the flywheel with the strap wrench, torque the flywheel nut to 90 ft-lb (122 N-m).

= T
Flywheel Nut: 90 ft-lb (122 N-m)

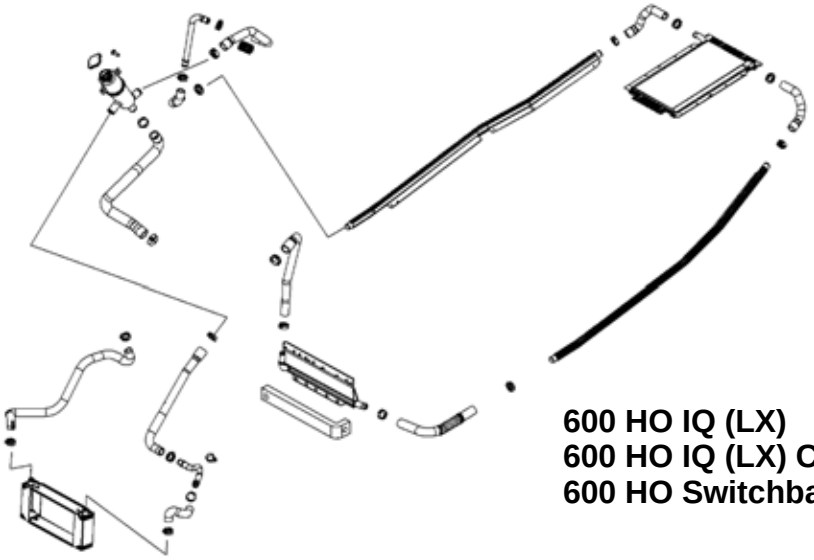
7. Install the recoil basket (4) and the recoil basket bolts (3) on the flywheel and torque the bolts to 9 ft-lb (12 N-m).
8. Install recoil assembly (2) and torque to 9 ft-lb (12N-m).

COOLING SYSTEMS

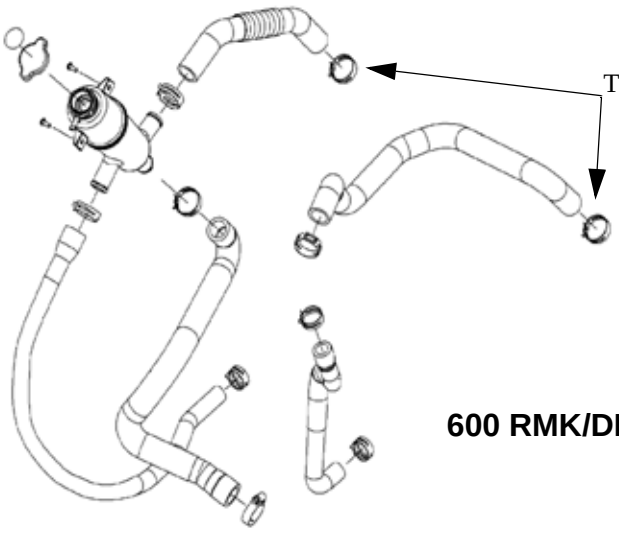
500/600/700 121/Switchback/RMK/DRAGON



500 XC SP

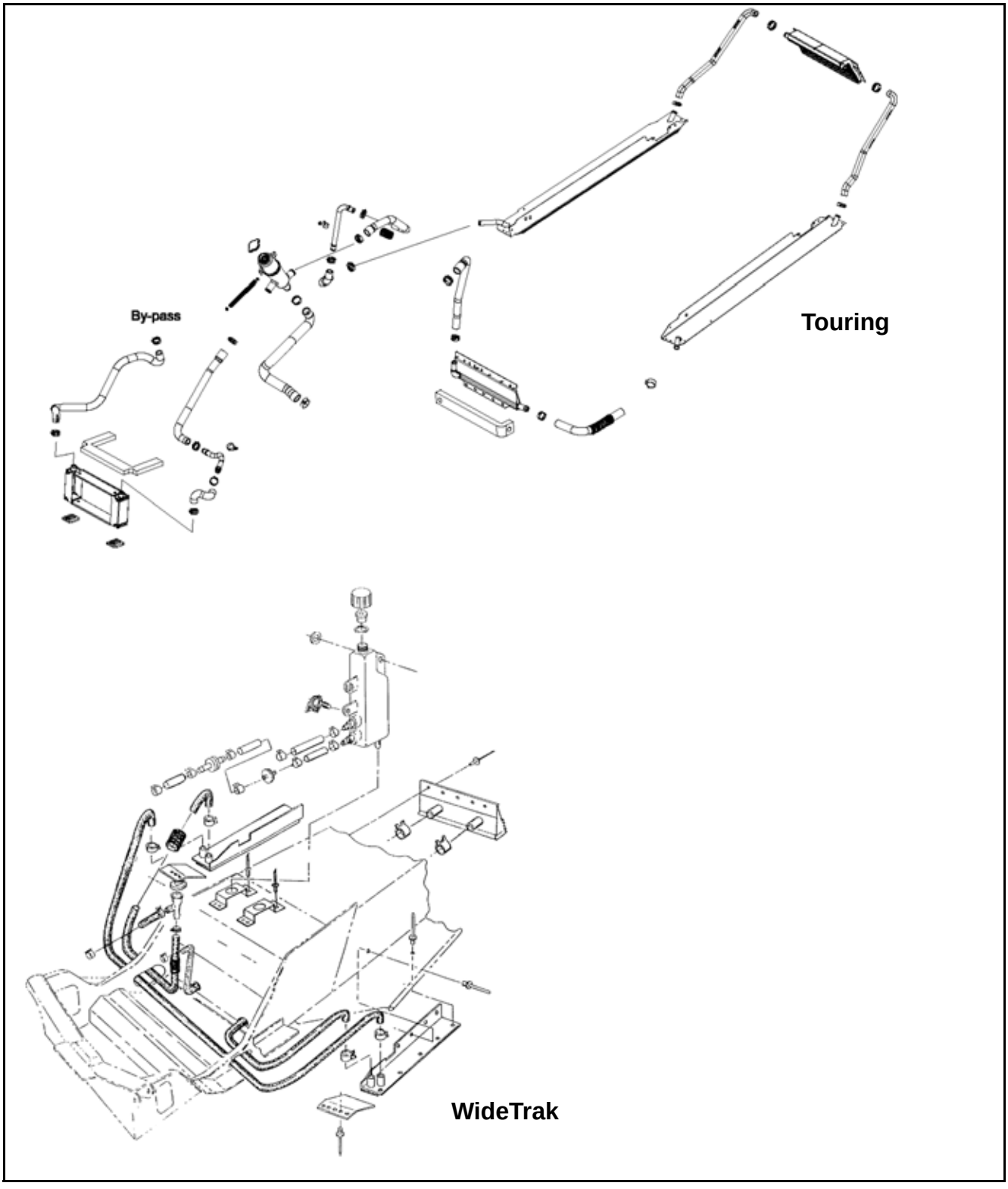


600 HO IQ (LX)
600 HO IQ (LX) CFI
600 HO Switchback



600 RMK/DRAGON

500/600 Touring / WideTrak LX



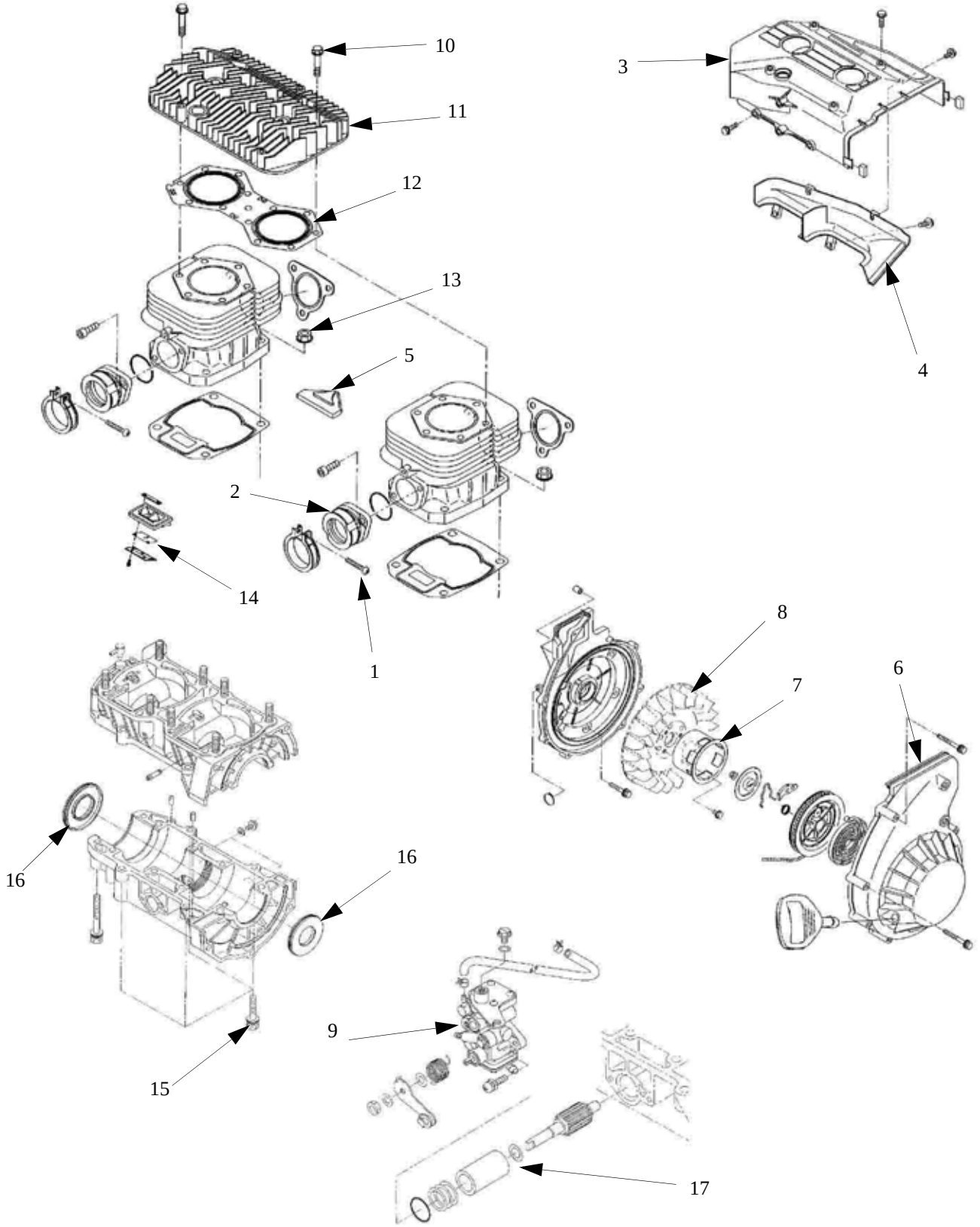
340/550 FUJI ENGINE

340/550 Fuji/500 Liberty Engine Removal/installation

1. Turn the fuel valve to the “OFF” position.
2. Remove the exhaust system.
3. Disconnect the battery ground (-) if applicable.
4. Disconnect the CDI box.
5. Remove the spark plug leads form the spark plugs.
6. Disconnect the stator connection(s).
7. Remove the air box.
8. Remove the drive belt. See “Drive Belt Removal” on page 6.10.
9. Remove the drive and driven clutches. See “Drive Clutch Removal” on page 6.15. See “Driven Clutch Removal” on page 6.21.
10. Remove the recoil handle and secure the rope so that it is on the recoil housing.
11. Loosen the carburetor clamps that are holding the carburetor onto the boots.
12. Separate the carburetors and secure them out of the way for engine removal.
13. Disconnect the oil pump cable from the oil pump.
14. Disconnect the oil supply line at the oil pump, and plug the end with a clean bolt.
15. Remove the fuel pump impulse line from the engine.
16. Remove all the motor mount fasteners.
17. Remove the engine.
18. Install in reverse order.

340/550 Engine Disassembly (550 shown)

NOTE: Inspect all parts for wear or damage during disassembly. Replace all seals, o-rings, and gaskets with Genuine Pure Polaris parts during assembly.



1. Disconnect the coil pack and CDI from the wiring harness.
2. Loosen the carburetor clamps (1) and remove the carburetors from the mounting boots.
3. Note where the oil lines are routed and remove the oil lines from the carburetors.
4. Remove the carburetor mounting boots (2) from the cylinders.
5. Remove both the cylinder head (3) and the exhaust side fan (4) shrouds from the engine assembly.

   • 340 has a intake side shroud

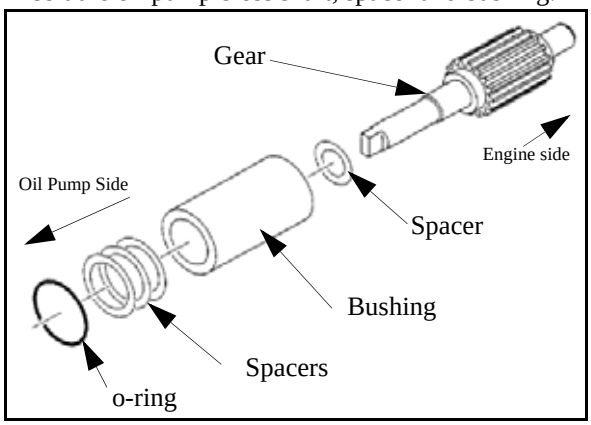
6. After removing the fan shrouds, take note of the vibration dampener (5) located between the cylinders intake side (550 only).
7. Remove the recoil cover (6).
8. Remove the recoil cup (7).
9. Hold the flywheel with the holding wrench PN 8700229 and remove the flywheel nut and washer.
10. Using a flywheel puller (PN 2871043), remove the flywheel (8) from the engine. Do not install the puller bolts in amy more than 5/16" of an inch/7.9mm into the flywheel threads or stator damage may result.
11. Remove the flywheel.
12. Remove the blower housing that the stator is mounted too.

NOTE: Make sure to account for the dowels on the blower housing (550 only).

13. Remove the oil pump (9). Note the o-ring and shim placement.
14. Remove the cylinder head bolts (10).
15. Remove the cylinder head (11).
16. Remove the head gasket (12). During the removal process note that the gasket has a EX for exhaust side and UP for the orientation.
17. Remove the cylinder base nuts (13) and carefully remove each cylinder (550 only)
18. Remove the reed valve assembly (14) from the crankcase (550 only).
19. Remove the wrist pin c-clips
20. Using a piston pin puller (PN 2870386) remove the wrist pins from the pistons.
21. Turn the crankcase over and remove the crankcase bolts (15).
22. Carefully turn the case back over and separate the case halves.
23. Remove the crankshaft and crankcase seals (16).
24. Remove the oil pump bushing, spacer, and cross shaft (17) and inspect for any wear or damage.

Engine Assembly

1. Insert the oil pump cross shaft, spacer and bushing.



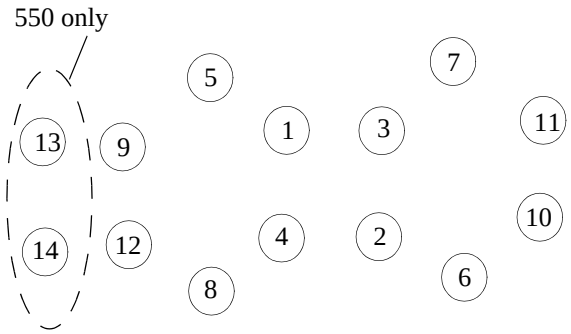
2. Install a new o-ring on the oil pump.
3. Place the oil pump aside for later installation.
4. Set the crankshaft into the lower case half.
5. Grease the oil pump drive gear area.

NOTE: Make sure that the crankshaft rotates smoothly and does not bind. Rotate the bearings so that the anti-rotation pins are resting in their appropriate galleries.

6. Apply 3-Bond (PN 2871557) sealer to the top half of the crankcase.
7. Install new crankcase oil seals with spring and lip facing inward toward the crank bearing.
8. Match up the top half of the crankcase to the lower case and hold the case halves together and turn it upside down.

9. Install the crankcase bolts and torque to (550 = 15-18 ft-lb (25 N-m) (340 = 8mm -23 to 25 N-m, 10mm - 32-35 N-m) in the pattern shown below.

CRANKCASE TORQUE PATTERN-FUJI

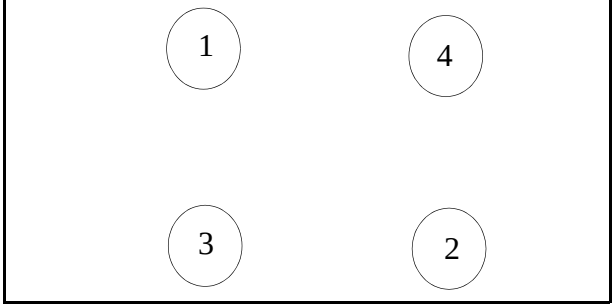


= T

550 Crankcase Bolts 15-18 ft.lb. (20-25 N-m)
340 Crankcase Bolts: 8mm=17-18 ft-lb (23-25N-m)
10mm=24-26 ft-lb (18-19 N-m)

10. Turn the crankcase over and lubricate crankshaft main bearings through the access holes.
11. Apply Polaris 2-Stroke engine oil to the wrist pins and the small end bearings and install the pistons with the arrow on the piston crown facing the flywheel (MAG) side. This will orientate the piston so that the piston ring locating pins will be in the intake side of the engine. Install wrist pins onto the crankshaft with the piston installation tool (PN 2830386).
12. Lubricate rings and the pistons with Polaris 2-Stroke oil and install the rings with the letter, mark or beveled side facing upward.
13. Install the c-clips into the piston so that the opening of the "C" is positioned at the 12:00 or 6:00 position.
14. Install the reed valves in to the intake of the crankcase.
15. Install new base gaskets.
16. Compress the piston rings and install each cylinder onto the crankcase.
17. Torque the cylinder base nuts to:

CYLINDER BASE TORQUE PATTERN-FUJI

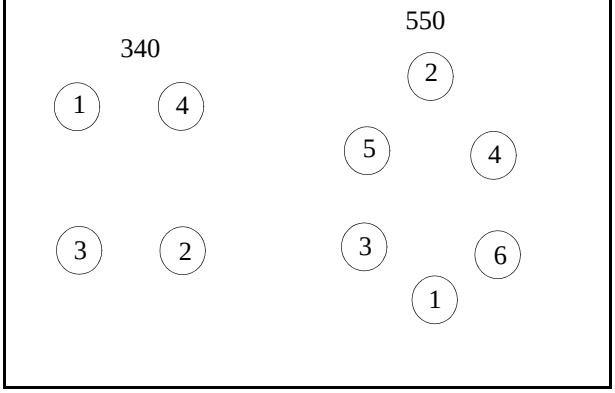


= T

340 = 17-18 ft.lb. (23-25 N-m)
550 = 25-30 ft.lb. (34-40 N-m)

18. Install a new head gasket with the "EX" facing the exhaust side. Also make sure that the "UP" is facing the intake side of the engine. (550 only)
19. Insert the head bolts and torque to:

CYLINDER HEAD TORQUE PATTERN-FUJI



= T

340 = 18-21 ft.lb. (25-28 N-m)
550 = 17-21 ft.lb. (23-28 N-m)

20. Insert the dowels on the blower housing that match up with the crankcase (550 only).
21. Route the stator wires harness correctly.
22. Install the flywheel, lock washer, woodruff key, and flywheel nut onto the shaft.

23. Torque the flywheel nut to:

= T
340 = 61-70 ft.lb. (83-90 N-m) 550 = 58-72 ft.lb. (79-98 N-m)

24. Install the recoil cup onto the flywheel.
25. Install the recoil cover.
26. Insert the vibration dampener in between the cooling fins that are located between the two cylinders on the intake side.
27. Install the fan shrouds.

NOTE: Make sure that the fan deflectors interlock before tightening down.

28. Install the oil pump onto the lower case half.

NOTE: Install all oil pump shims.

29. Apply Blue Loctite 243 to the oil pump mounting screw threads and torque to 48-72 in-lb (5.5-8.3 N-m).

= T
Oil Pump Mounting Screw Torque: 48-72 in-lb (5.5-8.3N-m)

30. Route each oil line on the oil pump in the correct positions.
31. Install intake boots (340 only).
32. Install the boot clamps onto the boots.
33. Install the carburetors onto the boots.
34. Tighten the boot clamps.
35. Insert engine into the chassis.

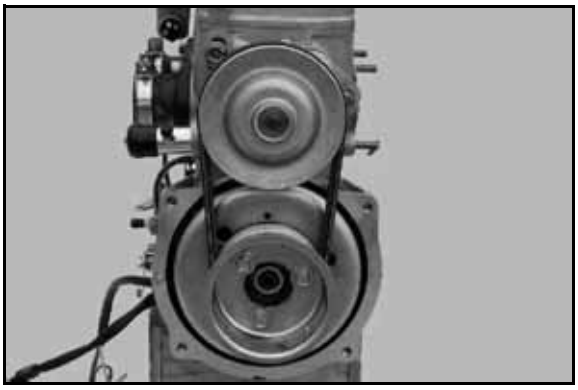
500 FUJI ENGINE

For engine removal See “340/550 Fuji/500 Liberty Engine Removal/installation” on page 5.11.

Disassembly

NOTE: Inspect all parts for wear or damage during disassembly. Replace all seals, O-rings, and gaskets with Genuine Polaris parts during assembly. Refer to General Section for Inspection Procedures.

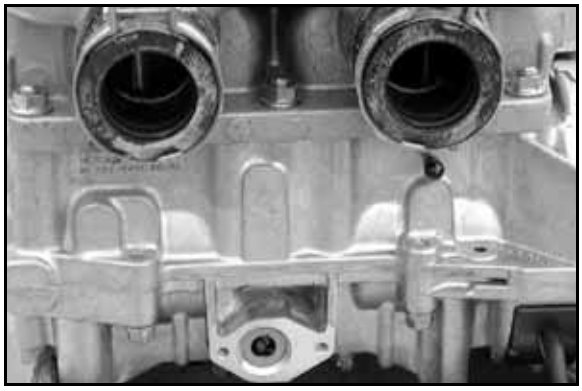
1. Remove carburetors, recoil housing and exhaust manifold.
2. Remove water pump, and starter recoil cup with water pump drive pulley and flywheel nut.



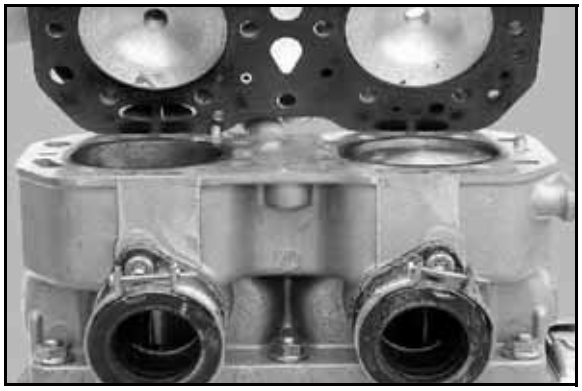
3. Install flywheel puller PN 2871043. Use all flywheel bolt holes. Do no install puller bolts more than 5/16" (7mm) into flywheel or stator damage may result.
4. Mark stator plate and crankcase for reference when reassembling the engine.



5. Using a screwdriver, remove stator screws.
6. Remove oil pump, oil pump feed lines from cylinders. Clean and inspect all components.



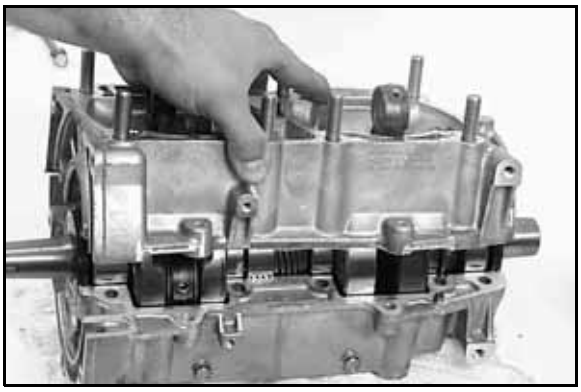
7. Remove the cylinder head.
8. Remove head gasket. Note the position of head gasket inlet and outlet hole sizes for reference during reassembly. Always replace head gasket after disassembly.



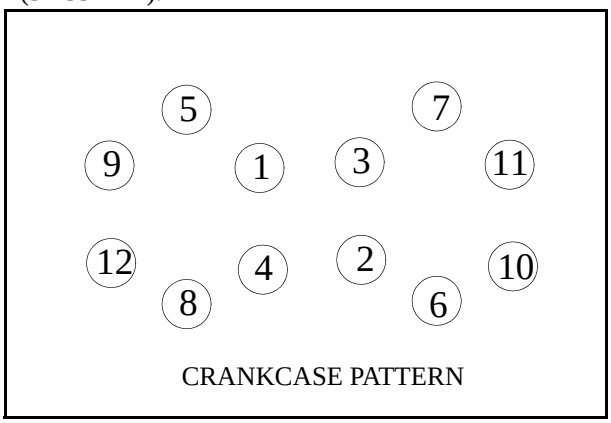
9. Remove cylinder.
10. Remove C-clip retainers from pistons.
11. Using piston pin puller, remove piston pin from piston.
12. Remove crankcase bolts.

Assembly

1. Grease oil pump drive gear area. Seals should be installed with spring and lip facing inward toward crankshaft.
2. Turn bearing until anti-rotation pins are positioned in the proper location.
3. Apply 3-Bond sealant to crankcase halves.



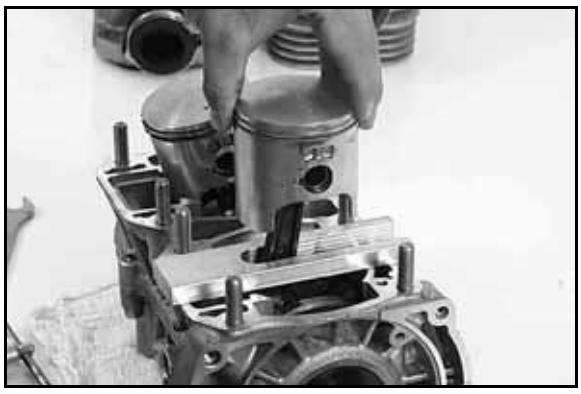
4. Torque crankcase bolts following sequence outlined in beginning of this chapter. Lubricate crankshaft main bearings through access holes. Torque 8mm Bolts to 17-18 f.-lb (22-23 N-m), and 10mm bolts to 23-25 ft-lb (32-35 N-m).



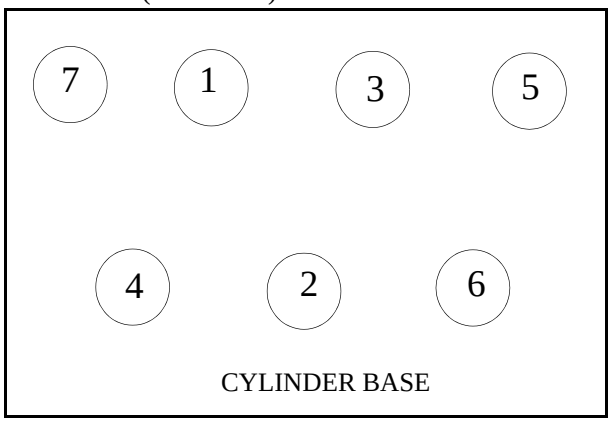
CRANKCASE PATTERN

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8mm Bolts to 17-18ft.lb. (23-25 N-m) 10mm Bolts 23-25 ft.lb. (32-35 N-m)

5. Install pistons arrow toward flywheel.



6. Install C-clip using installation tool PN 2870773.
7. Install new base gasket. Mount gasket with the white sealing material facing up.
8. Lubricate rings and pistons with two stroke oil. Install rings with letter, mark, or beveled side facing upward.
9. Lubricate rings and cylinder with Premium 2 Cycle Lubricant and compress rings with fingers, aligning end gaps with locating pins. Install cylinder with a gentle front-to-back rocking motion, being careful not to damage rings.
10. Install cylinder base nuts in pattern and torque to 27-31 ft-lb (37-43 N-m).

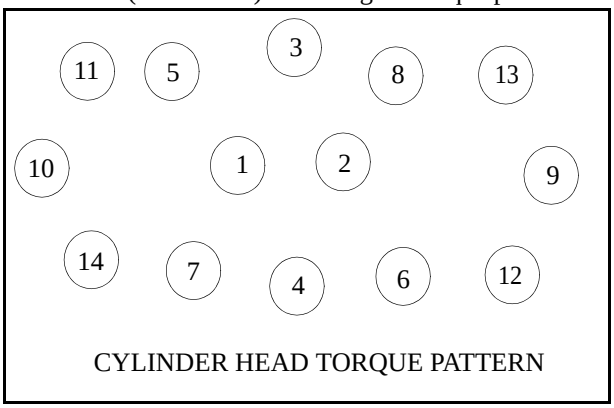


CYLINDER BASE

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Cylinder Base Nuts 27-31 ft.lb. (37-43 N-m)

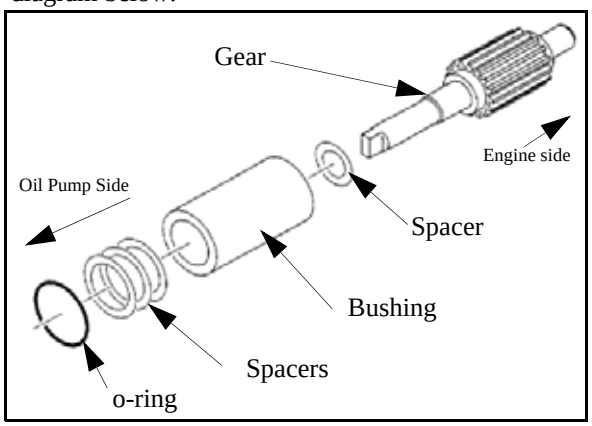
11. Install head gasket. Note proper position of gasket, “UP” facing upward, small intake hole on right (mag) side, large hole on left (PTO) side.

12. Install cylinder head and torque cylinder head nuts to 18 - 19.5 ft-lb (25-27 N-m) following the torque pattern.

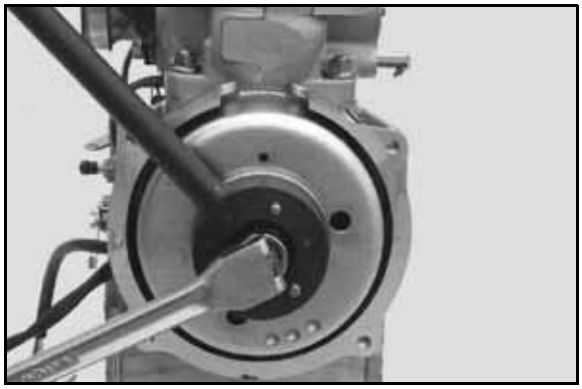


CYLINDER HEAD TORQUE PATTERN

13. Before installing oil pump drive gear, refer to Oil Pump end play adjustment.
14. Install oil pump drive gear in the sequence shown in diagram below.



15. Install oil pump.
16. Connect oil feed lines to the cylinders.
17. Align stator as previously marked on stator plate and secure with screws.
18. Install flywheel and torque flywheel nut to 60-65 ft-lb (83-95 N-m) using the flywheel holding tool PN 8700229.



19. Install water pump and recoil starter cup. make sure that the thicker end of the drive pulley is towards the flywheel.

NOTE: Belt deflection should be 1/8" - 3/16" (3-5mm)

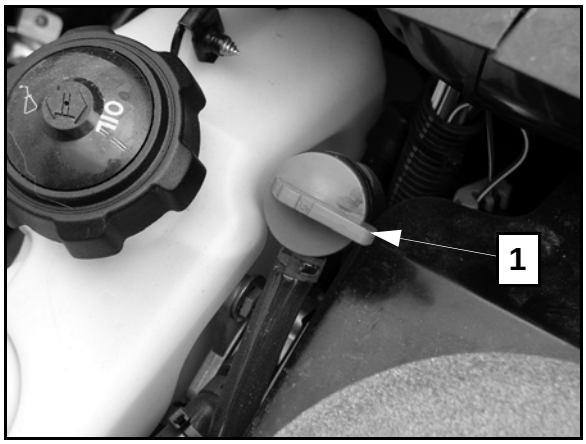
20. Adjust tension on water pump belt by loosening water pump mounting bolts, applying tension, and re-tightening bolts.
21. Install recoil housing and carburetors.
22. Assemble and install oil pump onto engine.
23. Hook up the oil lines.
24. Bleed the oil pump.
25. Connect CDI to stator plug connector.
26. Pre-mix (32:1) the first tank of fuel.

500/600 HO ENGINE

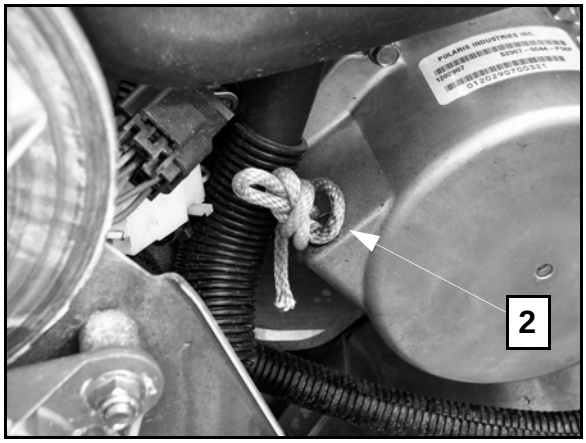
Engine Removal

NOTE: Inspect all parts for wear or damage during disassembly. Replace all seals, o-rings, and gaskets with Genuine Pure Polaris parts during assembly.

1. Remove the side panels (if applicable).
2. Disconnect battery ground (-) if applicable.
3. Turn the fuel valve to the "OFF" position (1).



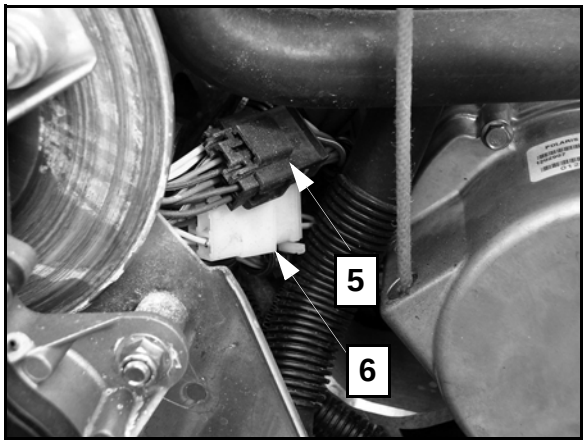
4. Remove the exhaust system.
5. Disconnect the CDI box and harness from the air box.
6. Pull up the air box and disconnect the vent lines and coil connections.
7. Remove the spark plug caps from the spark plugs.
8. Remove the air box.
9. Remove the recoil handle and secure the recoil rope (2).



10. Remove the drive belt, driven clutch and drive clutch.
11. Squeeze the vent line clamps and remove the exhaust valve vent lines from the top of the exhaust valve base.
12. Disconnect the DET sensor connection (4).



13. Remove the panduit strap and, disconnect the throttle position sensor (TPS) from the carburetor.
14. Disconnect the Regulator Rectifier (5) and the Stator connections (6). These are located behind the brake disc area.



15. Loosen up the boot clamps that hold the carburetor onto the intake.
16. Separate the carburetors from the engine.
17. Disconnect the oil supply lines from the carburetor and secure the carburetor assembly out of the way.

NOTE: Plug the carburetor areas to keep any debris from entering the carburetors.

18. Drain the engine coolant.

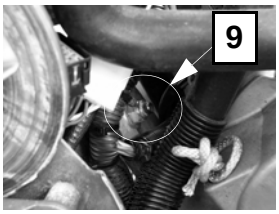
NOTE: Disconnect the thermostat hose and place the end into a container and use low air pressure and coolant should come out of the hose.

19. Move the thermostat hose clamp down on the hose far enough to clear the fitting on the head, and remove the hose.

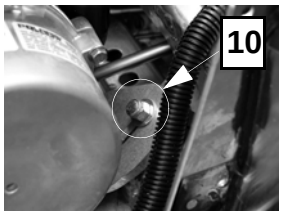
20. Move the hose clamp (7) and remove and secure it out of the way.



21. Remove the coolant supply hose that is located at the bottom of the coolant bottle and secure it out of the way. This will come out with the engine.
22. Remove the rear (9) and left (10) motor mount nuts located on the right hand side of the engine.

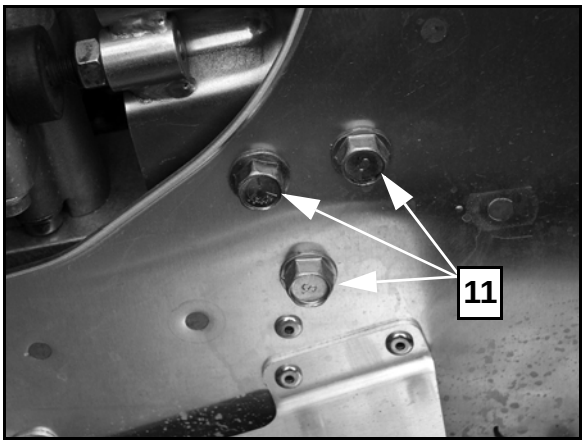


RH Rear

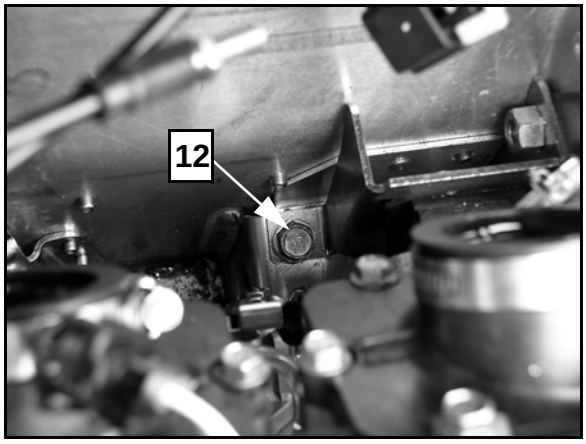


RH Front

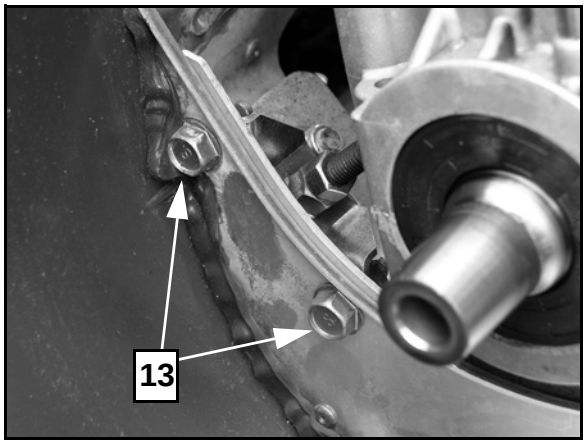
23. Remove the left hand rear torque stop fasteners (11)



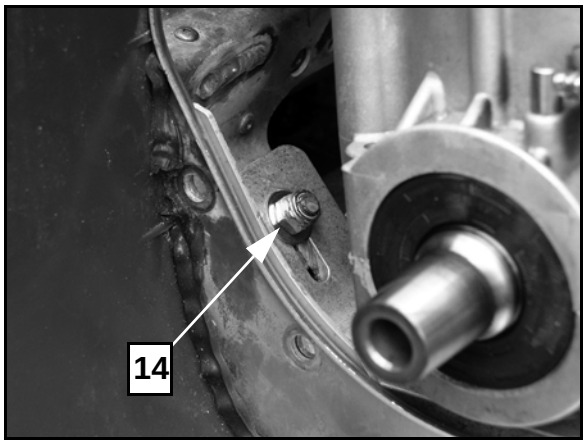
24. Remove the inside motor mount fastener (12), located under the PTO carburetor boot.



25. Remove the rear torque stop plate.
26. Remove the engine isolator limiter assembly fasteners (13) and then remove the torque stop assembly.

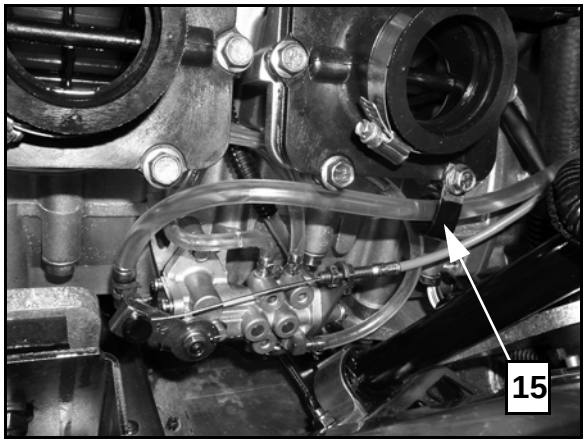


27. Remove the LH front motor mount nylock nut (14) and washer.

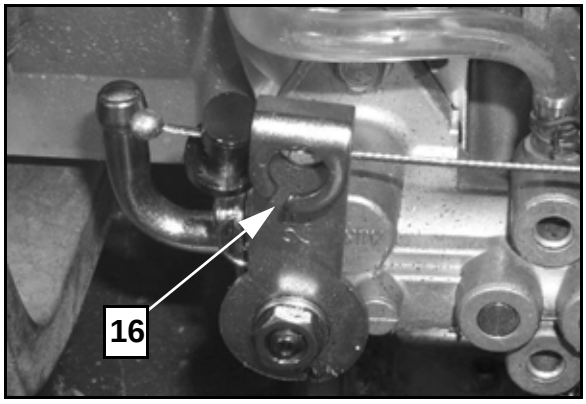


28. Remove the LH nose pan plug located on the nose pan next to the shock tower. This will allow access to the front fasteners for the LH chassis brace.

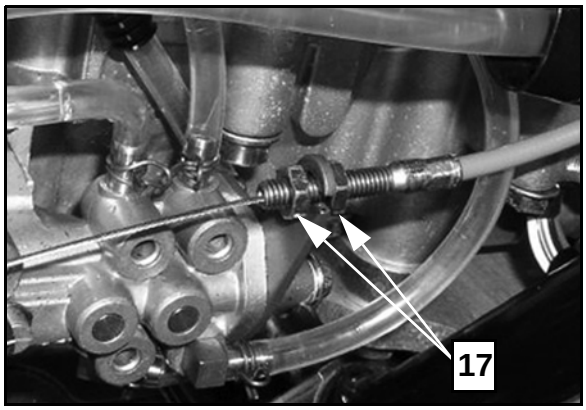
29. Remove and plug the oil supply line going to the oil pump, and route it through the guide (15).



30. Lift the front of the engine up and then tilt the rear so that the engine straps clear the motor mount studs.
31. Carefully place the engine on top of the shock tower brace.
32. Remove the oil cable from the oil pump lever by holding the pump open and rotating the cable and keeper to the slot (16) in the pump arm.

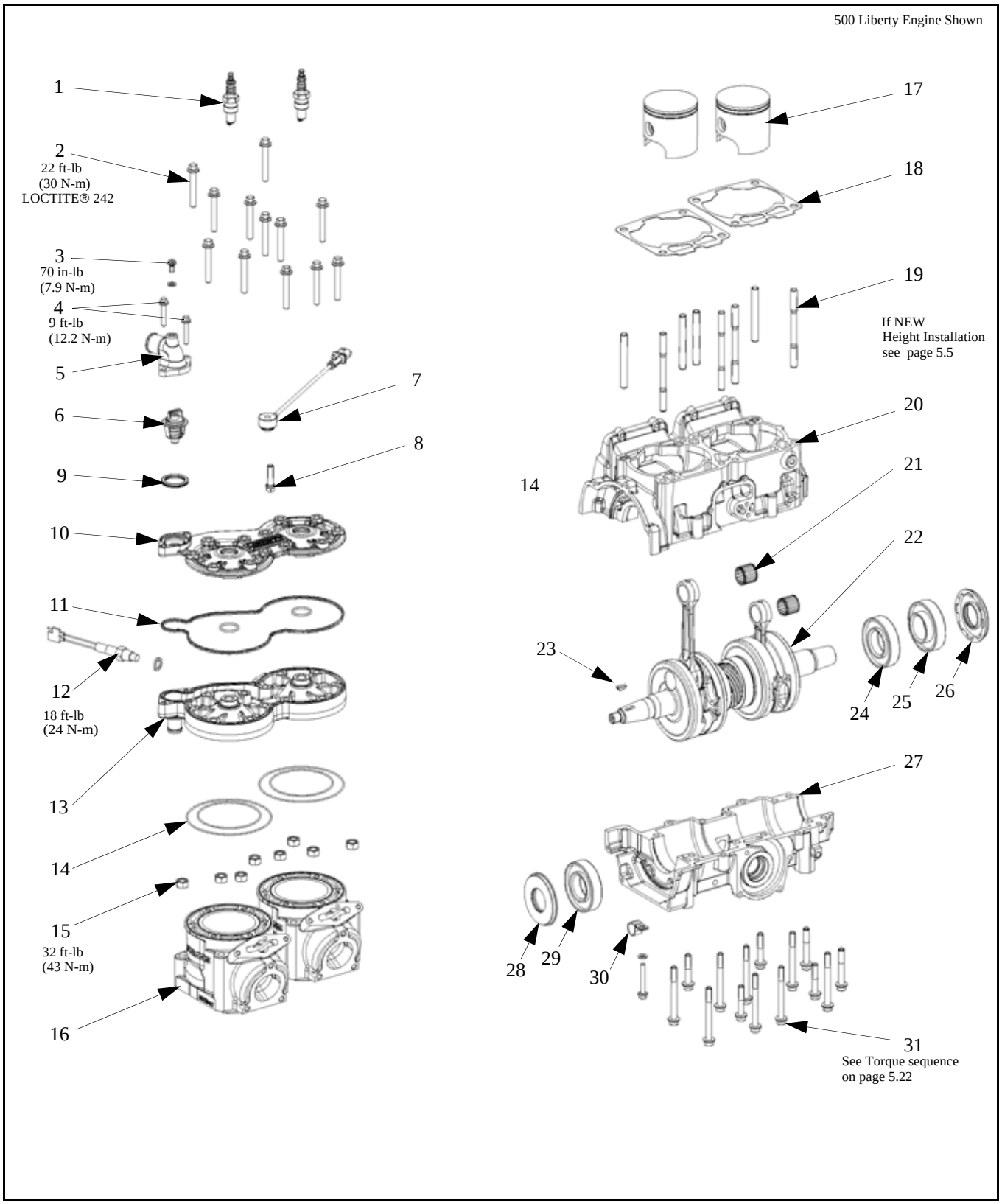


33. Loosen up the lock nuts (17) and remove the cable from the engine.



34. Remove the engine from the chassis.

500/600 (Carbureted) Engine Disassembly



1. Remove the spark plugs (1)
2. Remove reed valve assembly. See “Reed Valve Disassembly” on page 5.3.
3. Remove the recoil and stator assembly. See “Recoil/Stator Removal” on page 5.7.
4. Remove the head bolts (2).
5. Remove the head cover (10) and the rubber head seals (11).
6. Remove the head (13) and cylinder o-rings (14).
7. Remove the VES assembly. See “Exhaust Valve Disassembly” on page 5.3.
8. Remove the cylinder nuts (15) and carefully remove the cylinders (16) with a slight rocking motion.
9. Remove the c-clips that hold the wrist pin into the piston.
10. Using the piston pin puller PN PU-45255 remove the piston pins, and the piston (17) from the crankshaft rod.
11. Remove the water/oil pump assembly. See “500/600/700 Water/Oil Pump Cross Shaft Disassembly” on page 5.6.
12. If removing the engine mounting straps (these straps are mounted to the engine and bulkhead) label the direction and placement of each engine strap.
13. Remove the cylinder base gaskets (18) and replace them if damaged.
14. Turn over the crankcase and remove the bottom crankcase bolts (31).
15. Turn the crankcase assembly back over and remove the top of the crankcase (20).
16. Remove the crankshaft assembly (22-29), and refer to the General chapter for general engine component inspections and measurement procedures.
17. If new cases are to be installed make sure that the new cylinder studs are installed to the correct length. See “Cylinder Stud Installation” on page 5.5.

500/600 (Carbureted) Torques

When tightening bolts, nuts, or screws, a torque pattern may need to be followed to ensure uniform equal tension is applied to all fasteners. Proper torque application prevents fasteners from loosening or breaking in critical service. It also minimizes wear and eliminates premature or needless repair costs. Following uniform torque application sequence patterns ensures optimum performance from precision machined, close tolerance assemblies.

The most common units of torque in the English system are ft-lb (foot pounds) and in-lb (inch pounds). In the Metric system, torque is commonly expressed in units of N-m (Newton Meter).

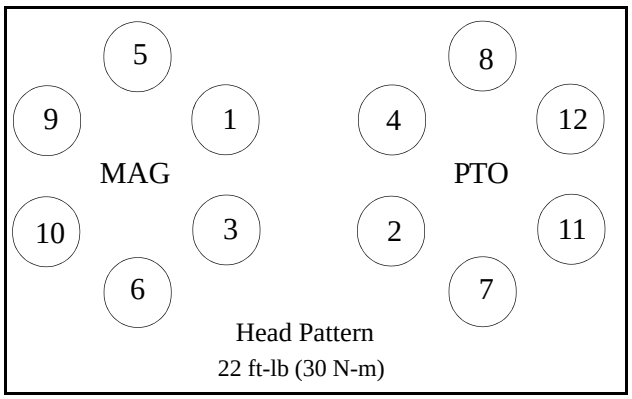
ENGINE 500/600	
SPARK PLUG	18 ft-lb (24 N-m)
CYLINDER HEAD	22ft-lb (30 N-m)1,3
BLEEDER SCREW	70 in-lb (8 N-m)
THERMOSTAT HOUSING	9 ft-lb (12 N-m)
WATER TEMPERATURE SENSOR	18-40ft-lb (24-54 N-m)2
WATER INLET PIPE	75ft-lb (102 N-m)2
DETIONATION SENSOR	168 in-lb(19 N-m)
CYLINDER BASE NUTS	32 ft-lb (43 N-m)3
EXHAUST VALVE COVER BOLTS	12 ft-lb (16 N-m)
EXHAUST VALVE NUT	144 in-lb (16 N-m)1
EXHAUST MANIFOLD BOLTS	22 ft-lb (30 N-m)
CARB ADAPTER BOLTS	108 in-lb (12 N-m)
OIL PUMP MOUNTING BOLTS	7 ft-lb (9 N-m)
CRANCASE PLUGS	10ft-lb (14 N-m)2
WATER PUMP IMPELLER NUT	120 in-lb (14 N-m)
WATER PUMP COVER BOLTS	108 in-lb (12 N-m)
CRANKCASE 6mm	9ft-lb (12 N-m)1,3
CRANKCASE 8mm	22ft-lb (30 N-m)1,3
ENGINE STRAP to CHASSIS NUT	18ft-lb (24 N-m)
ENGINE STRAP to ENGINE BOLT	45 ft-lb (61 N-m)
STATOR BOLTS	60 in-lb(7 N-m)1
TRIGGER COIL BOLTS	48 in-lb (5 N-m)
FLYWHEEL	90ft-lb (122 N-m)1
RECOIL CUP BOLTS	108 in-lb (12 N-m)
RECOIL COVER COLTS	108 in-lb (12 N-m)
DRIVE CLUTCH BOLT	50 ft-lb(68 N-m)
7/16” ENGINE MOUNT STRAP BOLTS	45 ft-lb (61 N-m)
REAR MOTOR MOUNTS BRACKET	29 ft-lb (39 N-m)

1 =Apply Loctite 242 to threads of bolt.

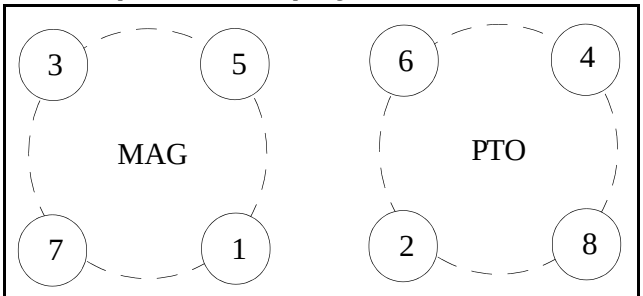
2= Apply Pipe sealant to threads.

3= See torque sequence.

500/600 (Carbureted) Cylinder Head Torque Pattern

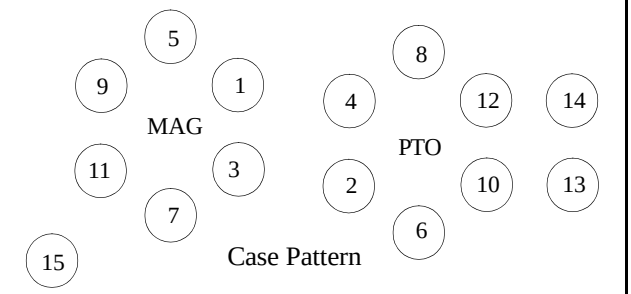


500/600 (Carbureted) Cylinder Base



Cylinder Base Pattern
32 ft-lb (43 N-m)

500/600 (Carbureted) Crankcase Torque Pattern



(Bolts 1 - 14) 22ft-lb (30 N-m)
(Bolt 15) 5 ft-lb (7N-m)

500/600 (Carbureted) Engine Assembly

1. Assemble the oil/water pump cross shaft as outlined on See “500/600/700 Water/Oil Pump Cross Shaft Assembly” on page 5.6.
2. Set the crankshaft assembly (22-29) into the lower crankcase (27).
3. Fill the cross shaft section of the lower crankcase with cross shaft break in lube PN 2872435.
4. Place the top crankcase (20) on top of the lower crankcase and crankshaft assembly. Make sure that seals are lined up properly to each case section.
5. Apply Loctite 242 to the threads of the lower crankcase bolts (31).
6. Assemble the crankcase bolts into the crankcases. Torque the bolts to 22 ft.lb. (30 N-m). See “500/600 (Carbureted) Crankcase Torque Pattern” on page 5.24.

= T
Head Bolt Torque 22 ft.lb. (30 N-m)

7. Lubricate the small end bearings (21) and the piston pins with Polaris 2 stroke oil and install the piston onto the crankshaft with the piston pin removal/installation tool PN PN PU-45255.
8. Install new c-clips in the piston grooves with the gap facing straight up (12:00 position) or straight down (6:00 position). Make sure that the c-clip is fully seated in the piston groove. Use c-clip installation tool PN 2872622A.
9. Install the piston rings onto the piston with the bevel side up and the gap facing the piston ring locating pin.
10. Install the base gaskets (18) on the upper crankcase.
11. Lubricate the cylinders and pistons with Polaris 2-stroke oil and carefully install the cylinder onto the pistons by squeezing the piston rings onto the locating pins and rocking the cylinder gently from the intake and exhaust sides.
12. Install the cylinder base nuts (15) and torque to 32 ft-lb(43.4 N-m) in the Cylinder Base pattern. See “500/600 (Carbureted) Cylinder Base” on page 5.24.

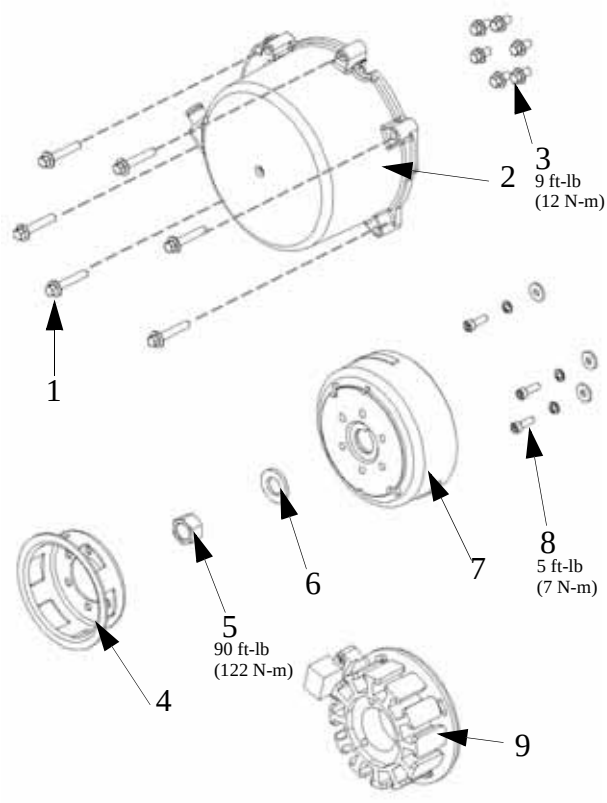
= T
Cylinder base Nut Torque 32 ft.lb. (43 N-m)

13. Install cylinder o-rings (14).
14. Install head cover o-rings (11) with the head cover (10) on the head.
15. Apply Loctite 242 on head bolt threads (2) and torque to 22ft-lb (29 N-m).

= T
Head Bolt Torque 22 ft.lb. (29 N-m)

16. Install VES. See “Exhaust Valve Assembly” on page 5.3.

500/600 (Carbureted) Recoil/Stator Removal



1. Remove the recoil cover (2).
2. Remove the recoil basket bolts (1) and the recoil basket (4).
3. Using a strap wrench PN PU-45419 hold the flywheel while taking the flywheel nut (5) and washer (6) off.
4. Using the Flywheel Puller PN 2871043, thread the puller bolts into the flywheel. Do not install puller bolts more than 5/16, (7mm) into flywheel threads or stator damage may result.
5. Tighten the center bolt and remove the flywheel (7).
6. Note the ignition timing marks that match up with the stator to the crankcase or scribe additional marks for reference for assembly.
7. Remove the stator bolts (8), and remove the stator (9). Be careful when removing the wires of the stator.

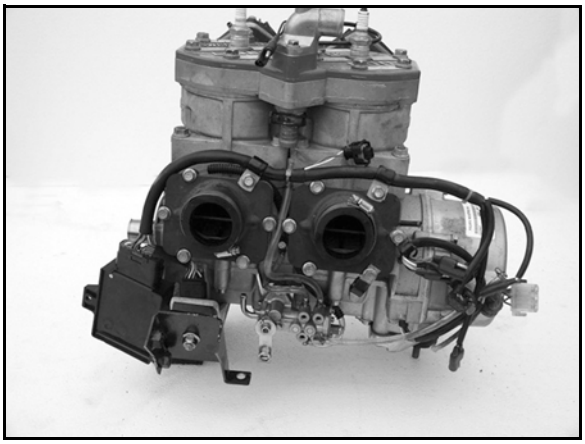
500/600 (Carbureted) Recoil/Stator Installation

NOTE: Inspect all parts for wear or damage during disassembly. Replace all seals, o-rings, and gaskets with Genuine Pure Polaris parts during assembly. Refer General chapter for general inspection procedures.

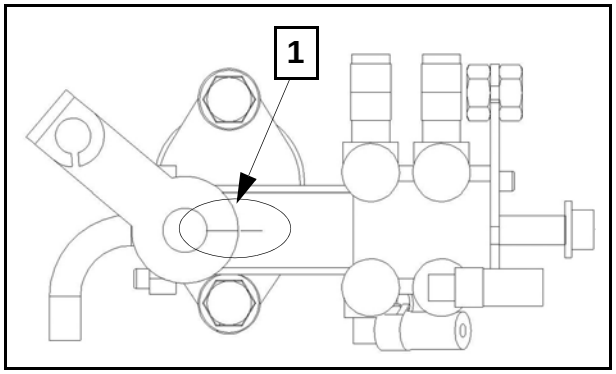
1. Install the stator (9) and align the timing marks that was noted earlier.
2. Apply Loctite 242 to the first few threads of the stator bolts (8) and torque to 5 ft-lb (7 N-m).
3. Install the flywheel (7) so that it matches up with the index of the woodruff key.
4. Apply Loctite 242 to the threads of the flywheel nut (5) and place the washer (6) and nut onto the end of the crankshaft.
5. Holding the flywheel with the strap wrench, torque the flywheel nut to 90 ft-lb (122 N-m).
6. Install the recoil basket (4) and the recoil basket bolts (3) on the flywheel and torque the bolts to 9 ft-lb (12 N-m).
7. Install recoil assembly (2) and torque the recoil assembly bolts (1) to 9 ft-lb (12 N-m).

500/600 (Carbureted) Engine Installation

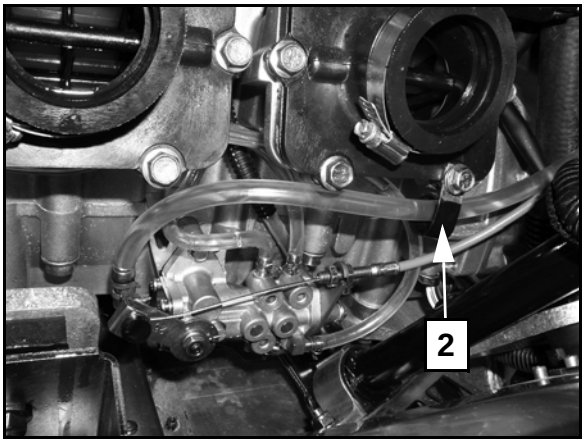
1. Make sure that you have the engine assembled so that it is in the same state as it was when it was removed.



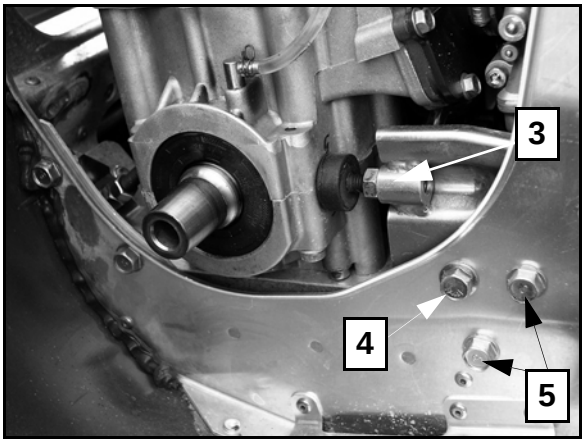
2. Place the engine on the shock tower bar and install the oil pump cable.
3. Adjust the oil cable line so that the line is even (1) with the index mark.



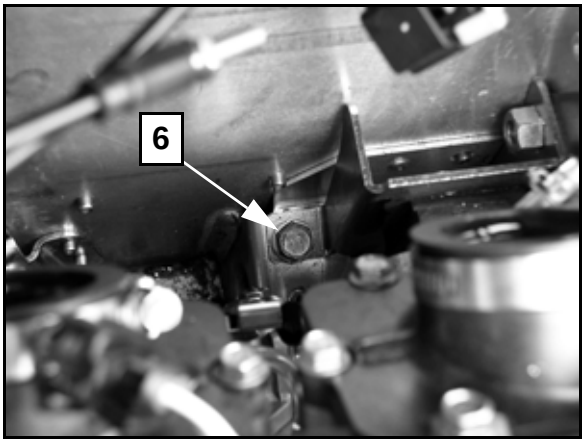
4. Install the oil supply line through the guide (2) on the MAG intake.



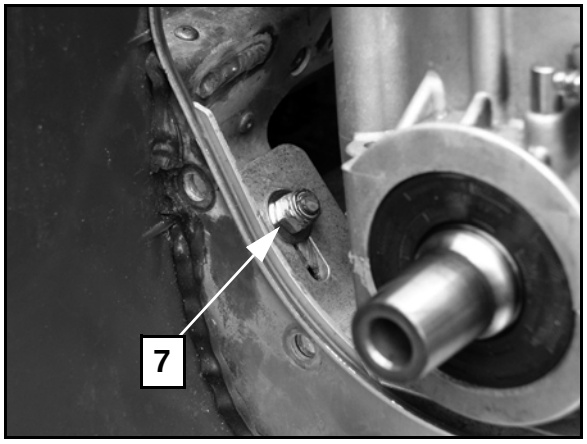
5. Place the engine into the bulk head and make sure that it is lined up with the motor mounts.
6. Insert the LH rear torque stop plate (3) between the motor mount and the bulk head.
7. Apply blue Loctite to the fastener (4) and torque all the outside fasteners (4,5) to 28 ft-lb(38 N-m).



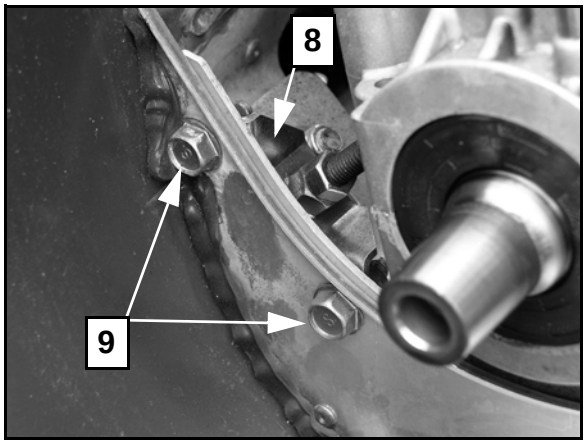
8. Install the LH rear motor mount fastener (6) and torque to 28 ft-lb (38 N-m).



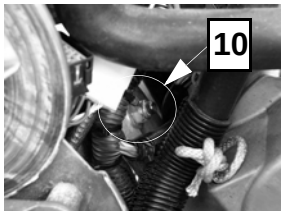
9. Insert the front engine strap washer and Nyloc nut (7) onto the motor mount stud and torque to 28 ft-lb (38 N-m).



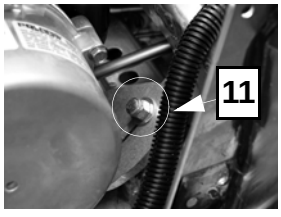
10. Adjust the front torque stop so that the bumper is bottomed out on the plate, and lock the lock nut.
11. Insert the front isolator limiter assembly (8) and torque the fasteners (9) to 28 ft-lb (38 N-m). See “Engine Isolator Limiter Setting” on page 3.22.



12. Install the RH rear (10) and RH front (11) motor mount washers and Nyloc nuts onto the motor mount studs. Torque to 28 ft-lb (38 N-m).



RH Rear

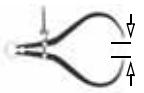


RH Front

= T

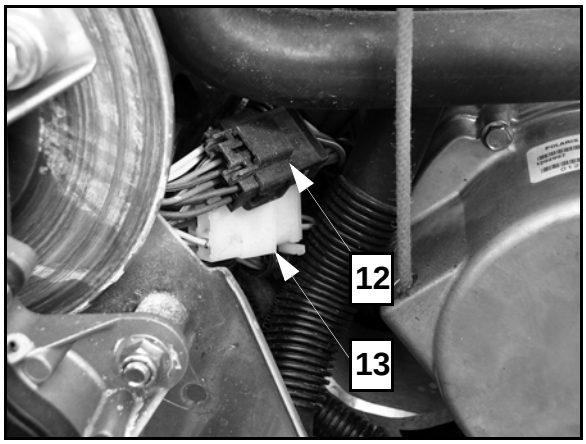
Motor Mount Nut: 28 ft-lb (38 N-m)

13. Adjust both torque stops so that you have a clearance of .010”-.030” (.25-.75mm).

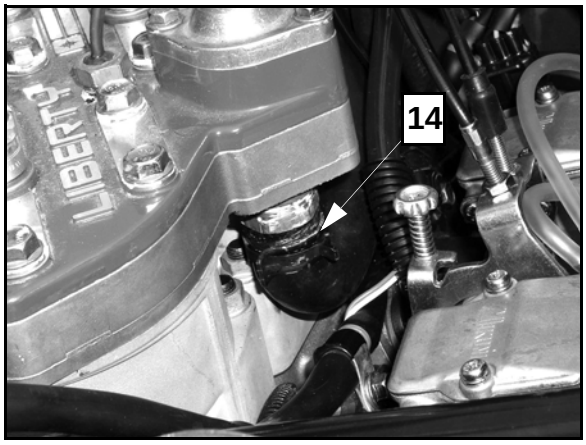


Torque Stop Clearance: .010"-.030" (.25-.75mm)

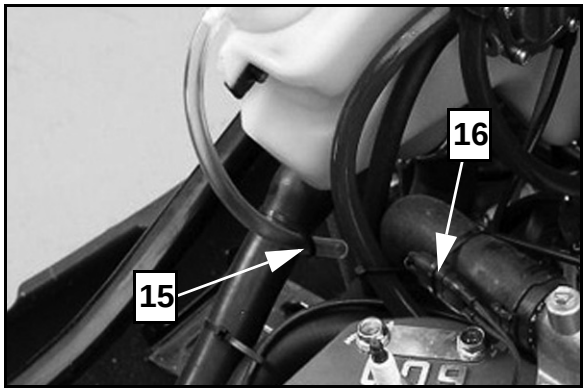
14. Connect the Regulator Rectifier (12) and Stator (13) connections.



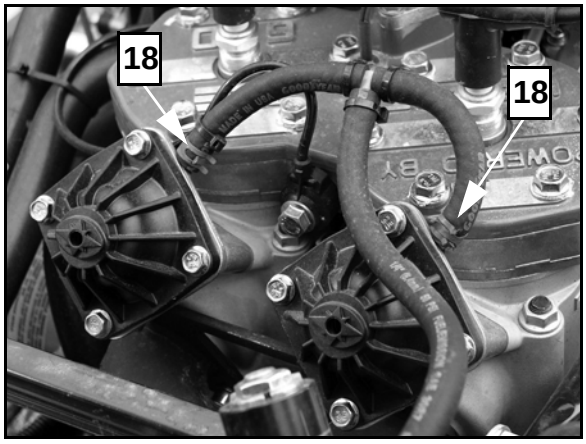
15. Connect the thermostat cooling hose and secure it with the clamp (14).



16. Connect the cooling hose going to the water pump (front of engine) to the water bottle and secure it with the clamp.
17. Connect the impulse line from the fuel pump to the crankcase.
18. Route the over fill hose (15) and secure it with a cable tie.
19. Connect the water temp sensor (16) and secure it to the thermostat hose with a cable tie.

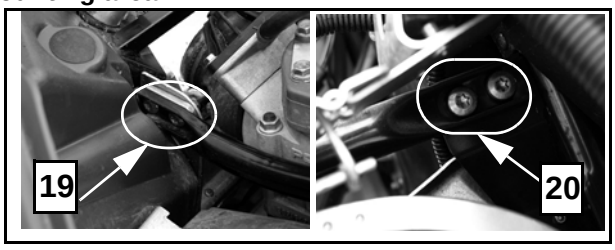


20. Connect the exhaust valve vent lines (18).



21. Install the oil supply lines to each of the carburetors.
22. Install the carburetors onto the carburetor boots and tighten the clamps.
23. Connect the TPS sensor to the carburetors.
24. Install the two, Nyloc nuts and two T40 Torx bolts to the front (19) and the two T40 to the rear (20) of the LH chassis brace and install the brace.

NOTE: Install the long bolts and the spacer on the front portion of the bar before inserting it into the mounting area.



25. Replace the nosepan plugs.
26. Install the air box.
27. Install the driven clutch. See “Drive Clutch Installation” on page 6.20.

28. Install drive clutch and belt. See “Driven Clutch Installation” on page 6.21.
29. Route the recoil rope through the console and secure the recoil handle.
30. Install the exhaust system.
31. Add coolant and bleed the cooling system.
32. Re-torque Drive Clutch to 50 ft-lb (69 N-m).

Torque Specifications

ENGINE	500/600/600HO
SPARK PLUG	18 ft-lb (24 N-m)
CYLINDER HEAD	22ft-lb (30 N-m)1,3
BLEEDER SCREW	70 in-lb (8 N-m)
THERMOSTAT HOUSING	9 ft-lb (12 N-m)
WATER TEMPERATURE SENSOR	18-40ft-lb (24-54 N-m)2
WATER INLET PIPE	75ft-lb (102 N-m)2
DETIONATION SENSOR	168 in-lb(19 N-m)
CYLINDER BASE NUTS	32 ft-lb (43 N-m)3
EXHAUST VALVE COVER BOLTS	12 ft-lb (16 N-m)
EXHAUST VALVE NUT	144 in-lb (16 N-m)1
EXHAUST MANIFOLD BOLTS	22 ft-lb (30 N-m)
CARB ADAPTER BOLTS	108 in-lb (12 N-m)
OIL PUMP MOUNTING BOLTS	7 ft-lb (9 N-m)
CRANCASE PLUGS	10ft-lb (14 N-m)2
WATER PUMP IMPELLER NUT	120 in-lb (14 N-m)
WATER PUMP COVER BOLTS	108 in-lb (12 N-m)
CRANKCASE 6mm	9ft-lb (12 N-m)1,3
CRANKCASE 8mm	22ft-lb (30 N-m)1,3
ENGINE STRAP to CHASSIS NUT	18ft-lb (24 N-m)
ENGINE STRAP to ENGINE BOLT	45 ft-lb (61 N-m)
STATOR BOLTS	60 in-lb(7 N-m)1
TRIGGER COIL BOLTS	48 in-lb (5 N-m)
FLYWHEEL	90ft-lb (122 N-m)1
RECOIL CUP BOLTS	108 in-lb (12 N-m)
RECOIL COVER COLTS	108 in-lb (12 N-m)
DRIVE CLUTCH BOLT	50 ft-lb(68 N-m)
7/16” ENGINE MOUNT STRAP BOLTS	45 ft-lb (61 N-m)
REAR MOTOR MOUNTS BRACKET	29 ft-lb (39 N-m)

1 =Apply Loctite 242 to threads of bolt.

2= Apply Pipe sealant to threads.

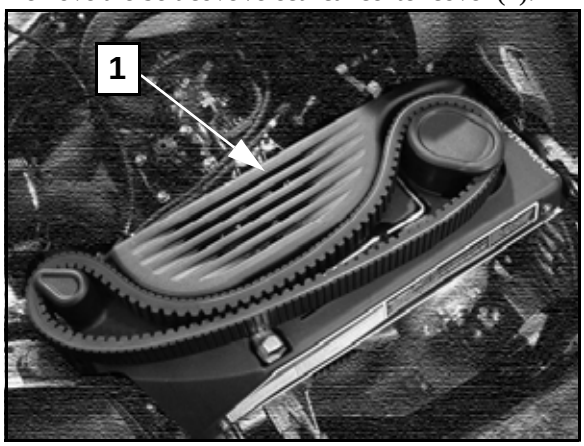
3= See torque sequence.

600 / 700 HO CFI ENGINE

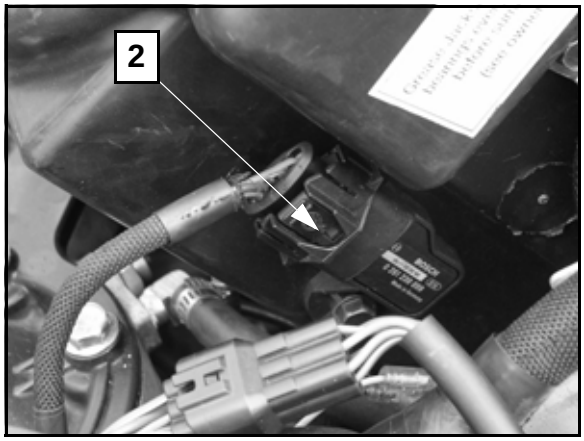
600/700 CFI Engine Removal

NOTE: Inspect all parts for wear or damage during disassembly. Replace all seals, o-rings, and gaskets with Genuine Pure Polaris parts during assembly.

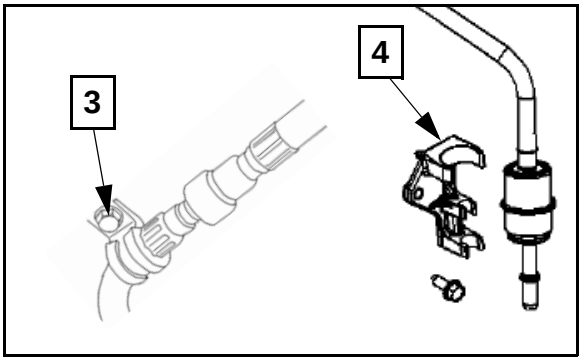
1. Remove the side panels. See "SIDE PANELS" on page 10.2.
2. Disconnect the battery ground (-) cable from the battery if equipped.
3. Unplug exhaust temperature sensor and remove the exhaust system.
4. Remove the spark plug leads from the spark plugs.
5. Remove the belt cover/electrical center cover (1).



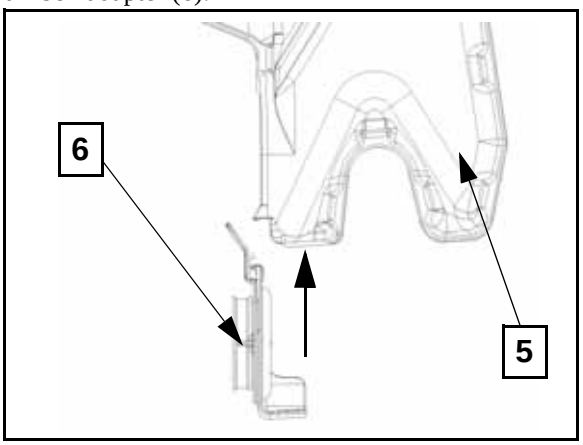
6. Disconnect the intake air sensor (2) located on the MAG side of the airbox.



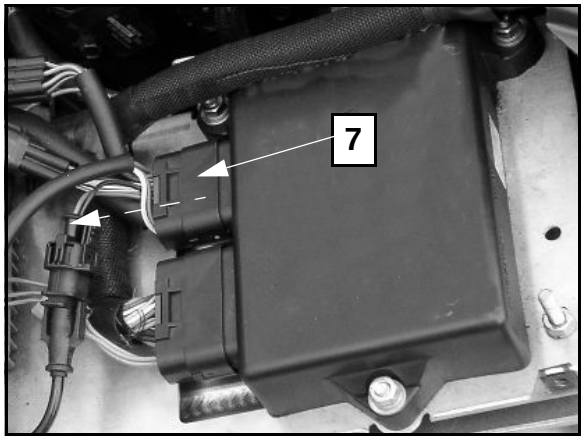
7. Remove the return fuel line "P" holder (3) located on the MAG side of the airbox.
8. Separate the fuel filter from the filter clip (4) that is on the MAG side of the airbox.



9. Remove the airbox (5) by pulling it straight out from the air box adapter (6).

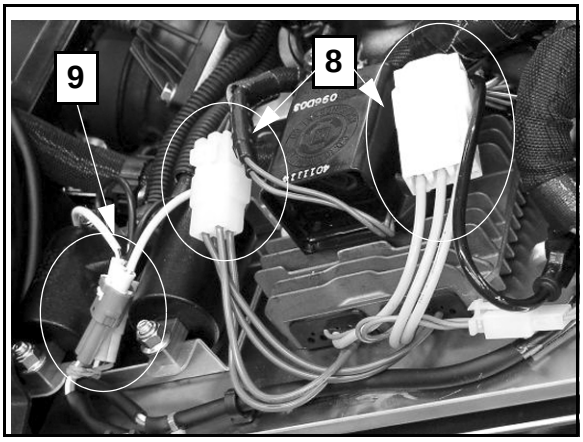


10. Disconnect the main harness (7) at the ECU. This is the smaller of the two plugs located on the ECU. Remove it by pressing up on the underside of the plug and pulling straight off.

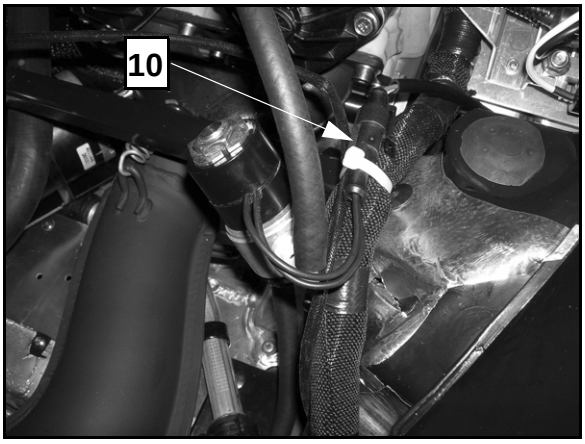


11. Disconnect the regulator rectifier connections (8).

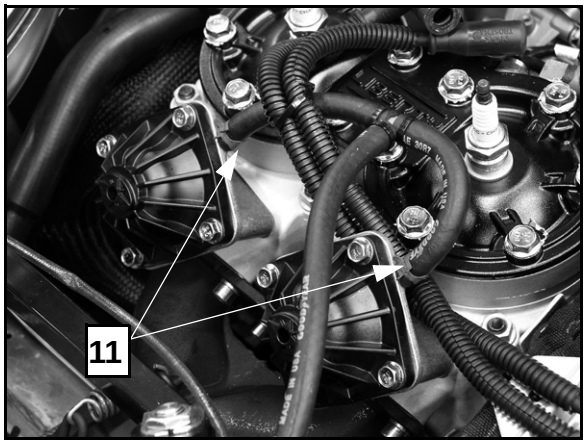
12. Disconnect the ignition coil connections (9) and EV solenoid from the ECU harness.



13. Disconnect the EV solenoid (10) from the ECU harness.

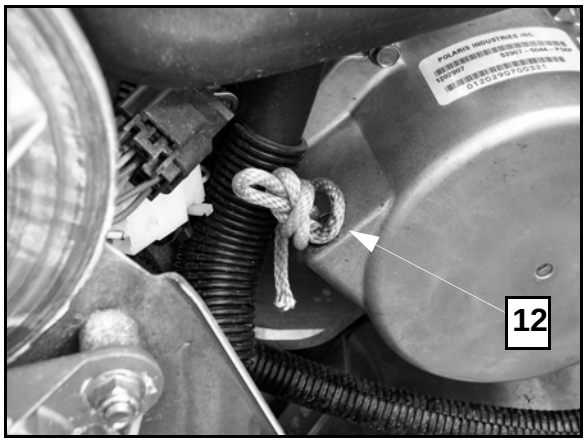


14. Disconnect the EV vent lines from the EV base (11) and secure the vent lines out of the way.



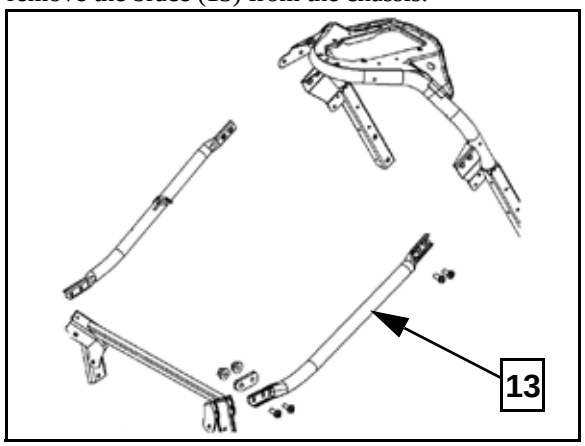
15. Remove the drive belt, driven and drive clutches. See Chapter 6.

16. Remove the recoil rope from the handle and route rope through the guide on the chassis brace and secure the recoil rope by tying a knot (12) so that it does not go into the recoil housing.

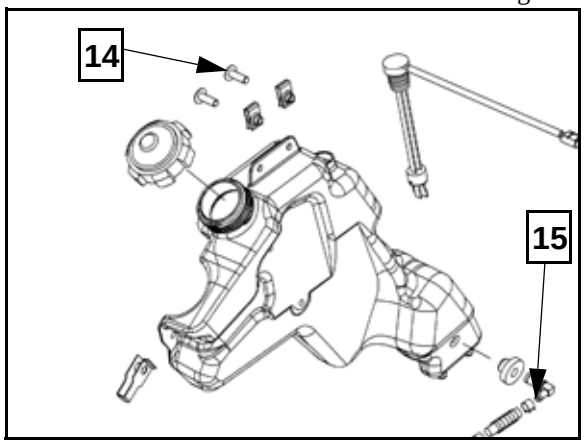


17. Drain the coolant from the engine.

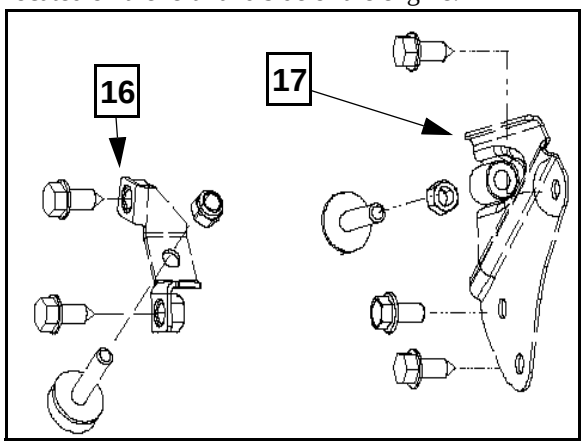
18. Remove all coolant hoses from the coolant bottle and secure the loose hoses out of the way for engine removal.
19. Remove the four right hand chassis brace fasteners and remove the brace (13) from the chassis.



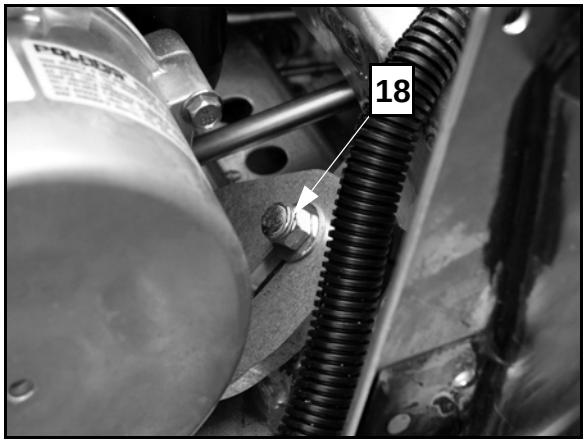
20. Drain the oil from oil tank.
21. Remove the oil tank fasteners (14) that hold the top of the oil tank to the chassis.
22. Disconnect the oil supply line (15) from the oil tank, located at the bottom portion of the oil tank. Plug and secure the loose oil line so that it can come out with the engine.



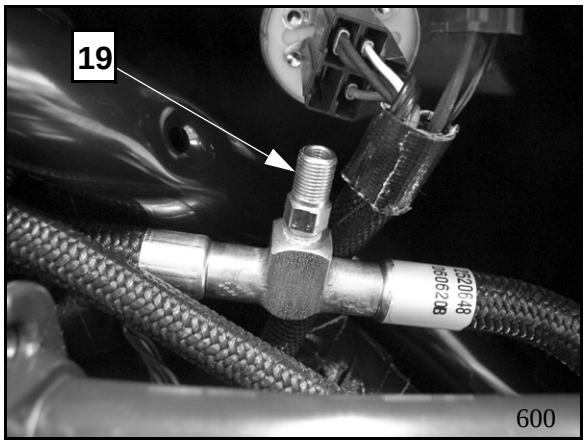
23. Remove the engine isolator (16) and rear torque stop (17) located on the left hand side of the engine.



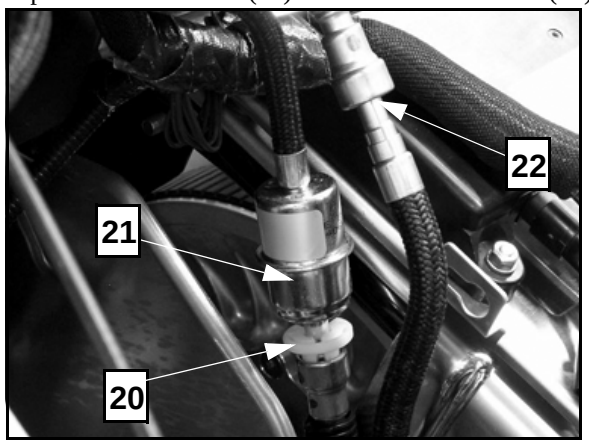
24. Remove the four engine mounting fasteners (18) located on the engine straps.



25. Remove the Schrader valve cover located under the steering hoop (19), and depressurize the fuel rail. See "Fuel Rail Bleeding" on page 4.20.



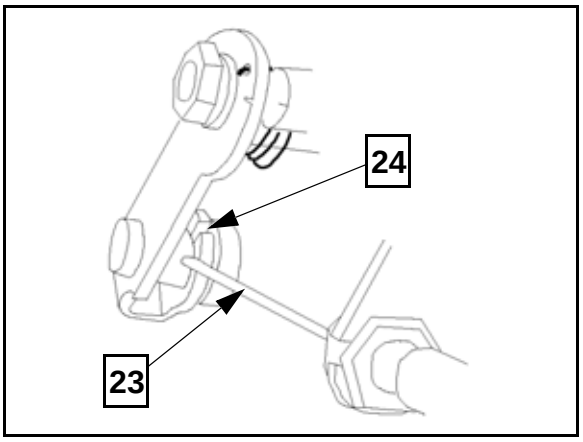
26. Using the fuel line disconnection tool (PN PS-47152) (20), separate the fuel filter (21) and the fuel return line (22).



27. Secure the loose fuel lines out of the way for engine removal.

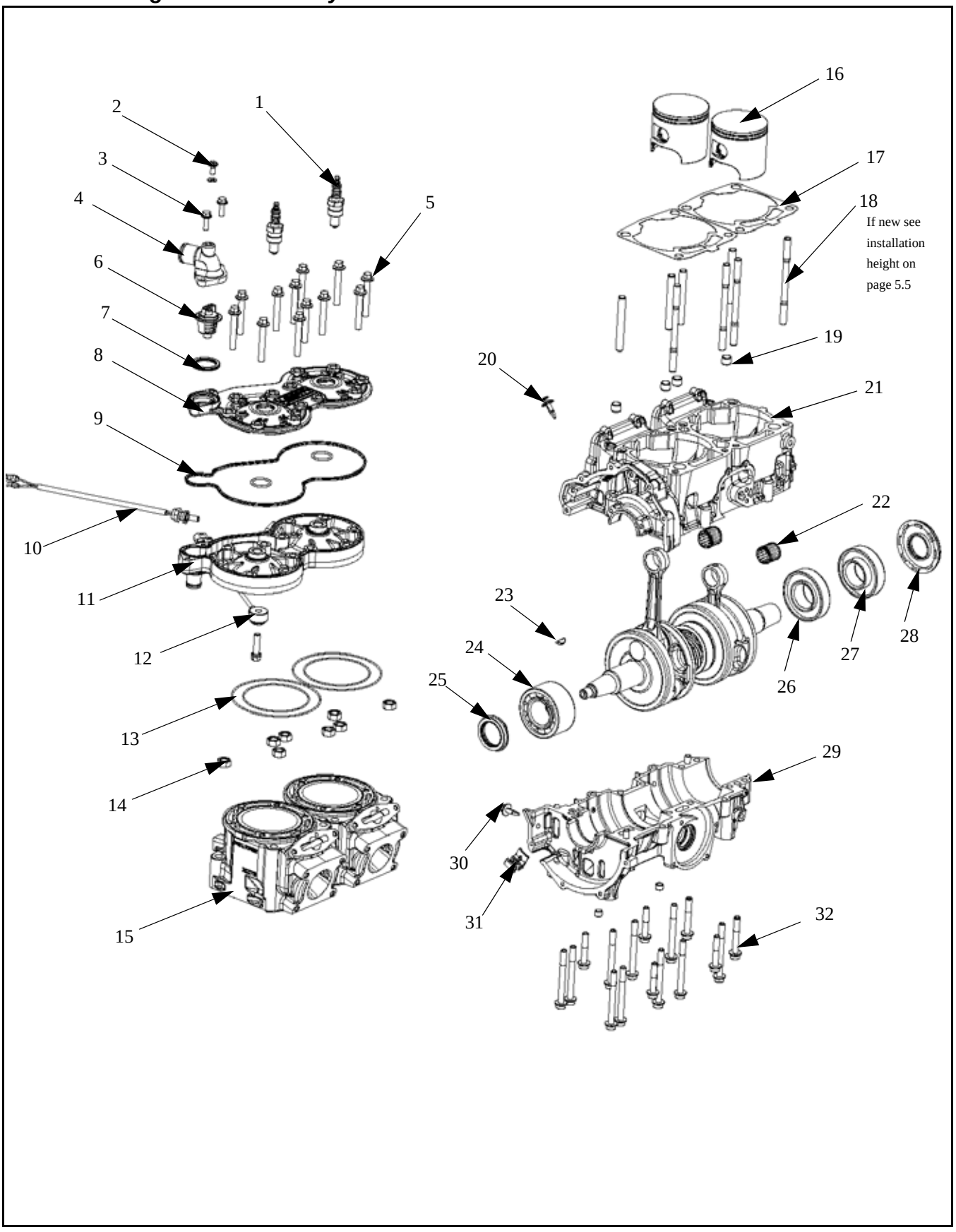
NOTE: A helper will be needed for the following steps.

28. Lift engine out of chassis and carefully place engine on shock tower brace.
29. While holding the engine remove the throttle bodies by loosening up the intake boot clamps and separating the throttle bodies from the intake boots.
30. Remove the cable located in the center of the throttle bodies.
31. Remove the oil cable lock nut from the threads on the cable housing.
32. Remove the throttle cable from the oil pump bracket.
33. Remove the oil cable (23) from the oil pump lever (24) by holding the pump open and rotating the cable and keeper to the slot in the pump arm.



34. Remove the cable from the oil pump bracket.
35. Remove the engine from the chassis.
36. Inspect the motor mounts and replace if needed. See “Engine Mount Replacement” on page 5.5.

600/700 CFI Engine Disassembly



1. Remove the spark plugs (1)
2. Remove reed valve assembly. See “Reed Valve Disassembly” on page 5.3.
3. Remove the recoil and stator assembly. See “Recoil/Stator Removal” on page 5.7.
4. Remove the fuel rail. See “600/700 CFI Fuel Rail/ Injector(s) Removal/Installation” on page 4.17.
5. Remove the head bolts (5).
6. Remove the head cover (8) and the rubber head seals (9).
7. Remove the head (11) and cylinder o-rings (13).
8. Remove the VES assembly. See “Exhaust Valve Disassembly” on page 5.3.
9. Remove the cylinder nuts (14) and carefully remove the cylinders (15) with a slight rocking motion.
10. Support one of the pistons with the piston support block PN 2870390.
11. Remove the c-clips that hold the wrist pin into the piston.
12. Using the piston pin puller PN 2870386 and adapter PN 2871445 remove the piston (wrist) pins, and the piston (16) and small end bearings (22) from the crankshaft rod.
13. Remove the water/oil pump assembly. See “500/600/700 Water/Oil Pump Cross Shaft Disassembly” on page 5.6.
14. If removing the engine mounting straps (these straps are mounted to the engine and bulkhead) label the direction and placement of each engine strap.
15. Remove the cylinder base gaskets (17) and replace them if damaged.
16. Turn over the crankcase and remove the bottom crankcase bolts (32).
17. Make sure that cylinder dowels (19) are accounted for.
18. Turn the crankcase assembly back over and remove the top of the crankcase (21).
19. Remove the crankshaft assembly (24-28), and refer to the General chapter for general engine component inspections and measurement procedures. See “INSPECTONS” on page 3.5.

NOTE: If new cases are to be installed make sure that the new cylinder studs are installed to the correct length. See “Cylinder Stud Installation” on page 5.5.

Engine Assembly

1. Assemble the oil/water pump cross shaft as outlined on See “500/600/700 Water/Oil Pump Cross Shaft Assembly” on page 5.6.
2. Set the crankshaft assembly (24-28) into the lower crankcase (29).
3. Fill the cross shaft section of the lower crankcase with cross shaft break in lube PN 2872435.
4. Place the top crankcase (21) on top of the lower crankcase (29) and crankshaft assembly. Make sure that seals (25, 28) are lined up properly to each case section.
5. Apply Loctite 242 to the threads of the lower crankcase bolts (32).
6. Assemble the crankcase bolts into the crankcases. Torque the bolts to 22 ft.lb. (30 N-m). Torque in sequence. See “600/700 CFI Crankcase Torque Pattern” on page 5.35.

= T
Head Bolt Torque 22 ft.lb. (30 N-m)

7. Lubricate the small end bearings (21) and the piston pins with Polaris 2 stroke oil and install the piston onto the crankshaft with the piston pin removal/installation tool PN 2870386 and adapter PN 2871445.
8. Install new c-clips in the piston grooves with the gap facing straight up (12:00 position) or straight down (6:00 position). Make sure that the c-clip is fully seated in the piston groove. Use c-clip installation tool PN 2872622A.
9. Install the piston rings onto the piston with the bevel side up and the gap facing the piston ring locating pin.
10. Install the base gaskets (17) on the upper crankcase.
11. Lubricate the cylinders and pistons with Polaris 2-stroke oil and carefully install the cylinder onto the pistons by squeezing the piston rings onto the locating pins and rocking the cylinder gently from the intake and exhaust sides.
12. Install the cylinder base nuts (14) and torque to 32 ft-lb (43.4 N-m) in the Cylinder Base pattern. See “600/700 CFI Cylinder Base” on page 5.35.

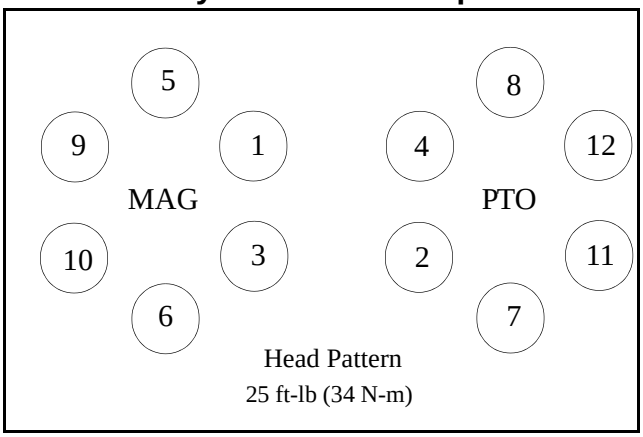
= T
Cylinder base Nut Torque 32 ft.lb. (43 N-m)

13. Install cylinder o-rings (13).
14. Install the head (11) onto the cylinders.
15. Install head cover o-rings (9) with the head cover (8) on the head.
16. Apply Loctite 242 on bolt threads (5) and torque to 22ft-lb (29 N-m). Torque in the pattern. See “600/700 CFI Cylinder Head Torque Pattern” on page 5.35.

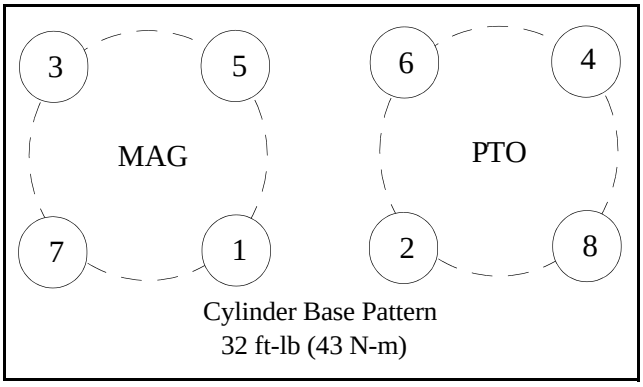
= T
Head Bolt Torque 22 ft.lb. (29 N-m)

17. Install VES. See “Exhaust Valve Assembly” on page 5.3.

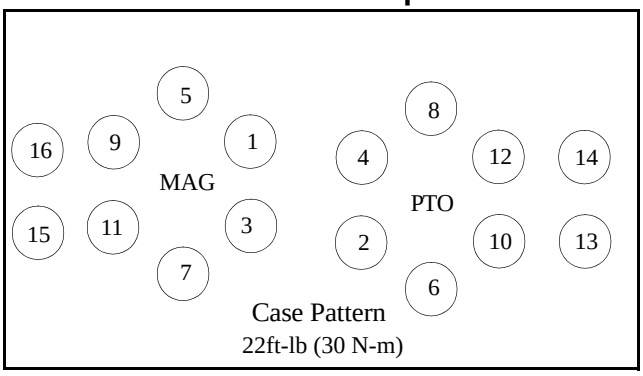
600/700 CFI Cylinder Head Torque Pattern



600/700 CFI Cylinder Base



600/700 CFI Crankcase Torque Pattern

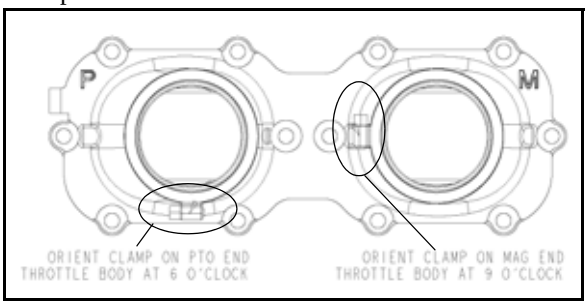


600/700 CFI Engine Installation

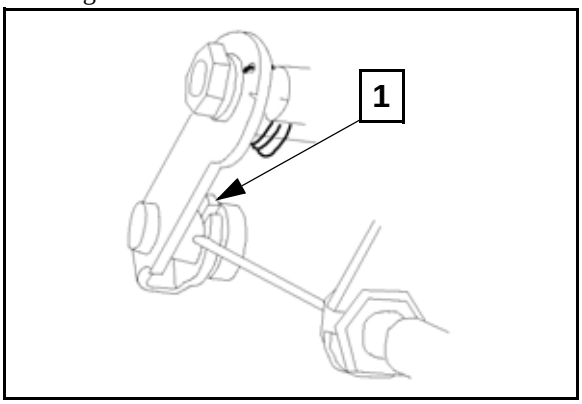
1. Make sure that you have the engine assembled in the state that it was when it was removed. This includes all the coolant hoses, oil lines, and electrical wires.
2. Fill oil lines with 2 stroke engine oil when assembling.
3. Clean the oil residue and debris out of the engine compartment.
4. To assure a smooth transition of the loose engine into the engine compartment, secure all loose hoses that are in side the engine compartment.

NOTE: You may need a helper with the installation of the throttle and oil cables.

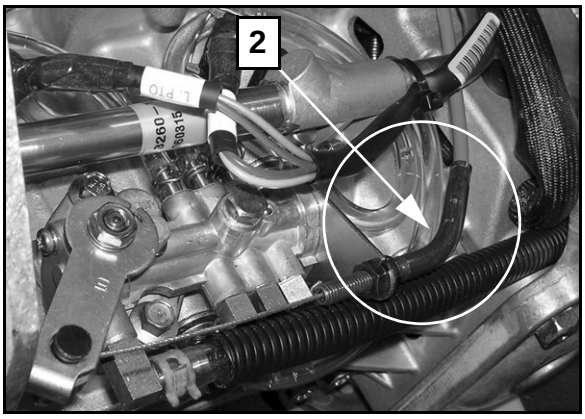
5. Place the engine on the shock tower brace and hold engine at this point.
6. With the throttle bodies separated from the intake adapters, route the throttle cable behind the fuel rail and insert the throttle cable into the throttle pulley located in the center of the throttle bodies.
7. Insert the throttle body into the adapters and tighten the clamps in the orientation as shown below.



8. Adjust the throttle cable adjuster nut so that you have the correct throttle free play. See “Throttle Lever Free Play - Non CFI” on page 3.18.
9. Place the oil cable into the oil pump arm. The oil pump arm has a slot (1) in the back to slide the cable through for installation. The plastic end of the throttle cable is inserted so that the large flat is facing the engine and the small end is facing the out side.



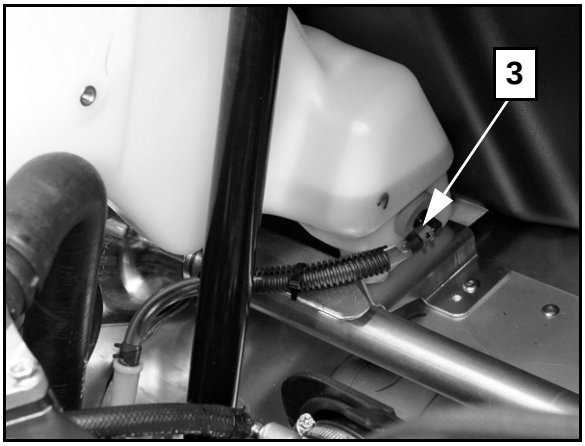
10. Using a 10mm open end wrench tighten the lock nut while holding the other nut with a 10mm open end wrench. Make sure that the oil cable angle is tilted slightly toward the engine (2).



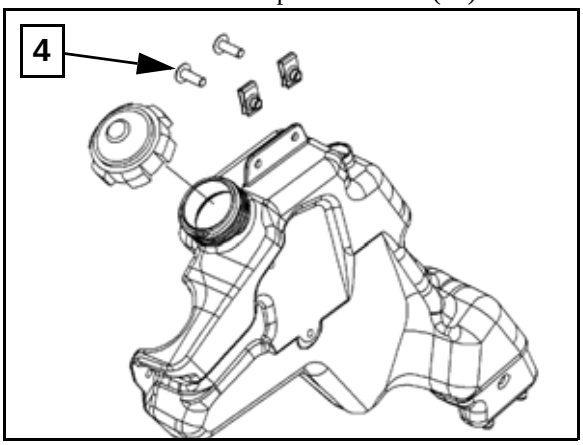
11. Thread on the adjuster nut and adjust the oil pump and adjust the oil pump. See "Oil Pump Adjustment" on page 3.19.
12. Carefully place the engine into the engine compartment and line up the engine mount studs with the engine straps on the engine.

NOTE: Make sure that all hoses, lines and wires are not pinched or interfere with installation.

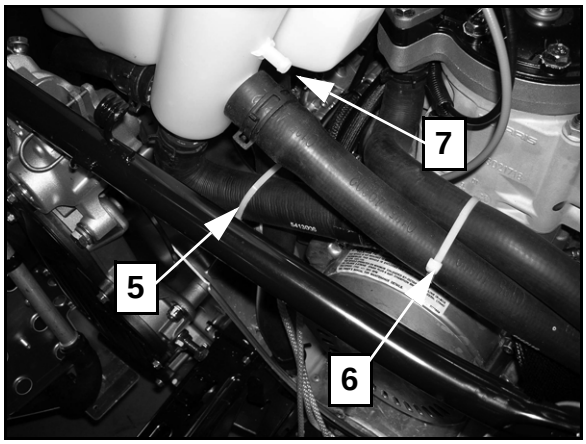
13. Route the oil supply line from the engine through the hose guide.
14. Install the oil bottle and hook up the supply line (3). Open and slide the hose clamp onto the hose and oil bottle fittings.



15. Secure the oil bottle to the chassis by installing the two torx fasteners located at the top of the bottle (14).

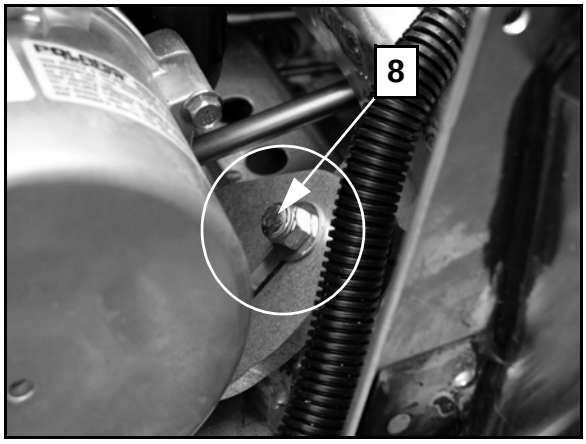


16. Connect the oil sender (Yellow and Purple wires) to the chassis connection (Purple and Brown wires).
17. Connect all the coolant hoses.
18. Place panduit straps in the locations shown (5, 6)
19. If applicable, place the coolant hose from the throttle bodies to the coolant bottle (7).



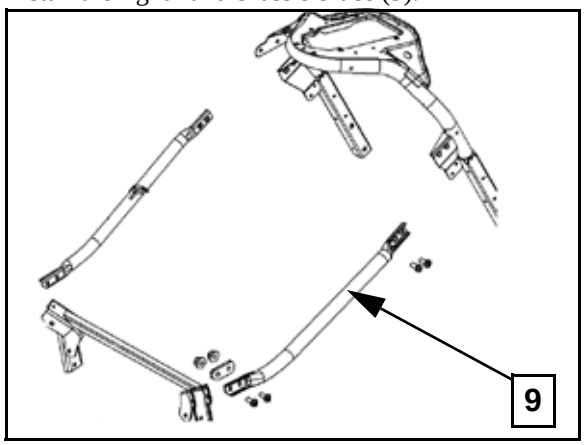
20. Secure the hose clamp over all coolant hose and fittings.

21. Place the engine mount washers and fasteners (8) onto the engine mount studs. Torque to specification.

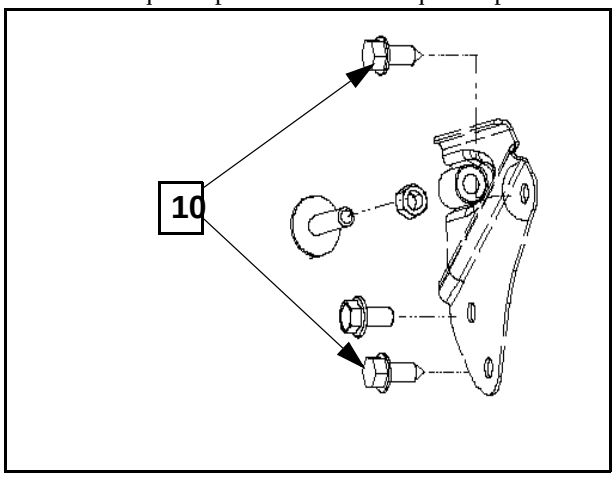


= T
Engine Mount Fasteners: 28 ft.lb (37.9 N-m)

22. Install the right hand chassis brace (9).



23. Apply Blue Loctite™ to the rear fasteners (10), install all the rear torque stop fasteners and torque to specification.



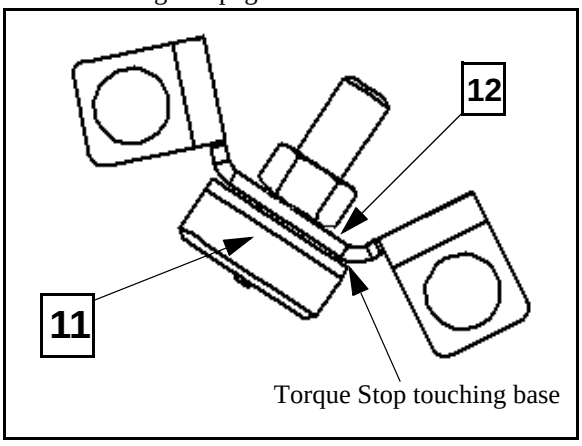
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Rear Torque Stop Fasteners: 28 ft.lb (37.9 N-m)

24. Adjust the rear torque stop so that you have a clearance of .010”-.030” (.25-.75mm) from the face of the torque stop to the surface of the engine.

= In. / mm.
Rear Torque Stop Clearance: .010"-.030" (.25-.75mm)

NOTE: If a new torque stop is installed, install it so that the nub is touching the engine. This nub is .030" (.75mm) long.

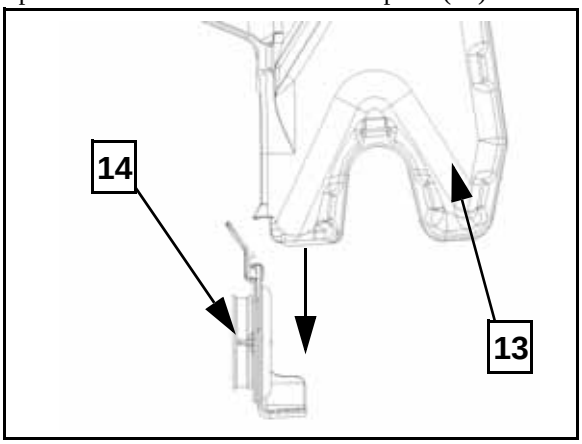
25. Adjust the engine isolator limiter (11) so that the stop is bottomed out on the brace (12). See “Engine Isolator Limiter Setting” on page 3.22.



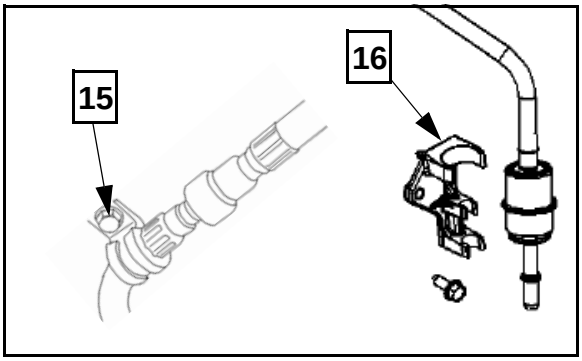
26. Install the front torque stop assembly and torque the plate fasteners to specification.

= T
Front Torque Stop Fasteners: 28 ft.lb (37.9 N-m)

27. Install the air box (13) onto the carb rack. Make sure to line up the air box tabs with the air box plate (14).

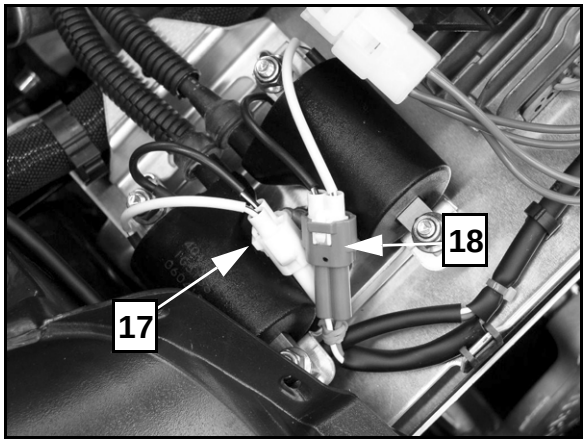


28. Install the drive clutch. See “Drive Clutch Installation” on page 6.20.
29. Install the driven clutch. See “Driven Clutch Installation” on page 6.21.
30. Install the belt. See “Drive Belt Installation” on page 6.10.
31. Hook up the fuel filter and fuel return line by pushing them together until you hear a audible “click”.
32. Secure the fuel return line “P” clamp (15) onto the side of the airbox.
33. Place the fuel filter back into the holder (16) that is on the airbox

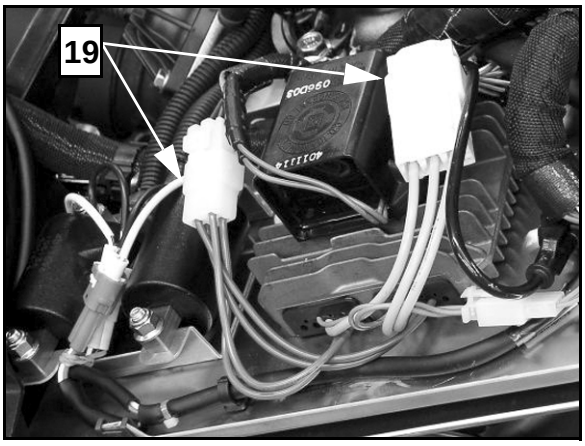


34. Connect the ECU connection into the ECU.
35. Connect the EV solenoid connection to the EV solenoid.
36. Connect the coil connections to the coils.

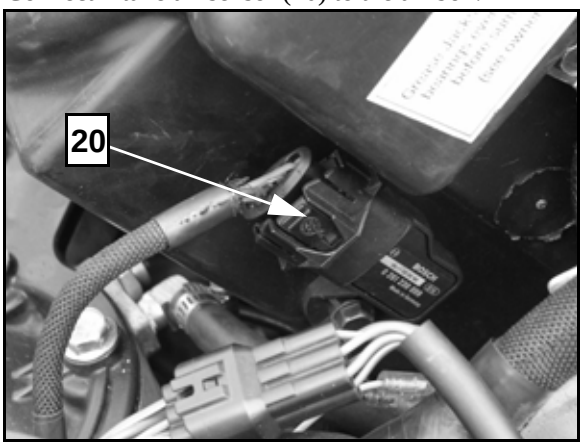
NOTE: The WHITE connector (17) goes to the MAG coil (upper). The BLUE connector (18) goes to the PTO coil (lower).



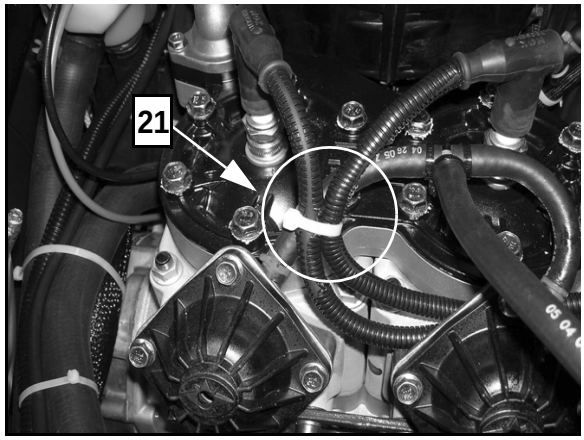
37. Connect the regulator rectifier connections (19).



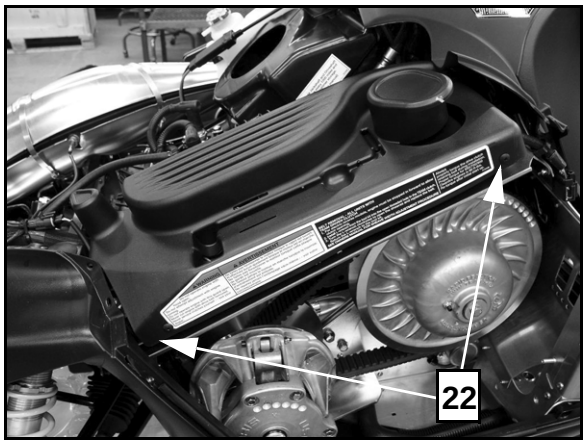
38. Connect intake air sensor (20) to the air box.



39. Connect the EV solenoid vent lines back onto the EV bases and install the panduit strap (21) around the spark plug wires as shown.

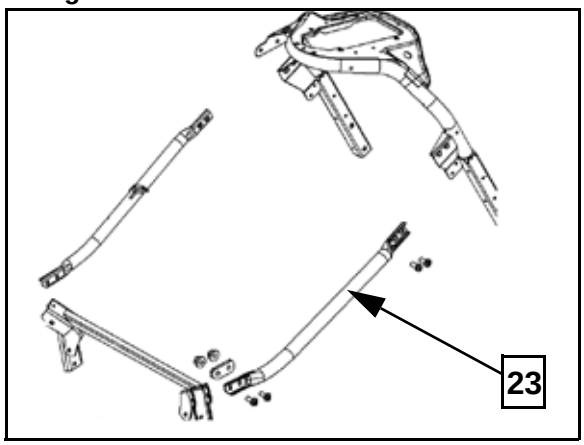


40. Install the electrical center/belt holder over the electrical center by aligning the rear buttons to the rear of the clutch cover and installing the two fasteners (22).



41. Install the Nyloc nuts and two T40 Torx bolts to the front and the two T40 to the rear of the LH and RH chassis brace (23) and install the braces.

NOTE: Install the long bolts and the spacer on the front portion of the bar before inserting it into the mounting area.



42. Replace the nosepan plugs were removed to access the front chassis brace fasteners.
43. Route the recoil rope through the eyelet on the chassis brace and secure handle once past the console.
44. Install the exhaust system.
45. Add coolant and bleed system. See “Cooling System Bleeding” on page 3.7.
46. Premix the first tank of fuel. See “2 Stroke Gasoline / Oil Pre Mix” on page 2.7.
47. Test run the unit and clear any codes with Digital Wrench.
48. After test running check drive and driven clutch torque.

Torque Specifications

When tightening bolts, nuts, or screws, a torque pattern may need to be followed to ensure uniform equal tension is applied to all fasteners. Proper torque application prevents fasteners from loosening or breaking in critical service. It also minimizes wear and eliminates premature or needless repair costs. Following uniform torque application sequence patterns ensures optimum performance from precision machined, close tolerance assemblies.

The most common units of torque in the English system are ft-lb (foot pounds) and in-lb (inch pounds). In the Metric system, torque is commonly expressed in units of N-m (Newton Meter).

ENGINE 600/700 CFI	
SPARK PLUG	18 ft-lb (24 N-m)
CYLINDER HEAD	22ft-lb (30 N-m)1,3
BLEEDER SCREW	70 in-lb (8 N-m)
THERMOSTAT HOUSING	9 ft-lb (12 N-m)
WATER TEMPERATURE SENSOR	18-40ft-lb (24-54 N-m)2
WATER INLET PIPE	75ft-lb (102 N-m)2
DETIONATION SENSOR	168 in-lb(19 N-m)
CYLINDER BASE NUTS	32 ft-lb (43 N-m)3
EXHAUST VALVE COVER BOLTS	12 ft-lb (16 N-m)
EXHAUST VALVE NUT	144 in-lb (16 N-m)1
EXHAUST MANIFOLD BOLTS	22 ft-lb (30 N-m)
CARB ADAPTER BOLTS	108 in-lb (12 N-m)
OIL PUMP MOUNTING BOLTS	7 ft-lb (9 N-m)
CRANCASE PLUGS	10ft-lb (14 N-m)2
WATER PUMP IMPELLER NUT	120 in-lb (14 N-m)
WATER PUMP COVER BOLTS	108 in-lb (12 N-m)
CRANKCASE 6mm	9ft-lb (12 N-m)1,3
CRANKCASE 8mm	22ft-lb (30 N-m)1,3
ENGINE STRAP to CHASSIS NUT	18ft-lb (24 N-m)
ENGINE STRAP to ENGINE BOLT	45 ft-lb (61 N-m)
STATOR BOLTS	60 in-lb(7 N-m)1
TRIGGER COIL BOLTS	48 in-lb (5 N-m)
FLYWHEEL	90ft-lb (122 N-m)1
RECOIL CUP BOLTS	108 in-lb (12 N-m)
RECOIL COVER COLTS	108 in-lb (12 N-m)
DRIVE CLUTCH BOLT	50 ft-lb(68 N-m)
7/16” ENGINE MOUNT STRAP BOLTS	45 ft-lb (61 N-m)
REAR MOTOR MOUNTS BRACKET	29 ft-lb (39 N-m)

1 =Apply Loctite 242 to threads of bolt.

2= Apply Pipe sealant to threads.

3= See torque sequence.

Specifications

COMPONENT	SPECIFICATION
Engine Model Number - 600 - 700	 S3206-6044-PF6H S3322-7044-PF7J
Engine Type	Two Stroke CFI/Case Reed Induction
Cylinder Displacement - 600 - 700	 599cc 700cc
Bore - MM (Inches) - 600 - 700	 77.25 (3.04″) 81 (3.19″)
Stroke - MM (Inches) - 600 - 700	 64 (2.52″) 68 (2.68″)
Unistalled Head Volume - 600 - 700	 34.7 - 35.7cc 35.84 - 36.84cc
Installed Head Volume - 600 - 700	 31.06 - 32.56cc 31.06 - 32.56cc
Installed Head Squish - 600 - 700	 .050″ - .064″ .050″ - .064″
Piston-to-Cylinder Clearance	.0043″ - .006″
Piston Ring End Gap	.012″ - .018″
Compression Ratio (Full Stroke) - 600 - 700	 10.7 : 1 12.3 : 1
Trigger-to-Flywheel Gap	.9mm (1.34mm MAX)

Fastener Torque Specifications

COMPONENT	TORQUE (LB.FT.)	TORQUE (N-M)	NOTES
Spark Plug	18	24	
Thermostat Bleed Screw	6	8	
Thermostat Cover	9	12	
Cylinder Head Cover	22	30	Loctite 242
Water Temp. Sensor	18	24	Thread Sealant
Knock Sensor	14	19	Clean and Dry
Fuel Supply Rail	9	12	
Cylinder Base Nuts	32	43	Pattern
Throttle Body Adapter	9	12	
Oil Pump	9	12	
EV Housing	12	16	Loctite 242
Exhaust Manifold	22	30	
Water Pump Cover	9	12	
Impeller Nut	10	13	
Flywheel Cover	9	12	
Recoil Pulley	9	12	
Flywheel Nut	90	122	
Stator	9	12	
Crankcase	22	30	Pattern
Water Pump Bushing	Torque so screw head is flush with case.		
Mounting Straps	35	48	Loctite 242

NOTES

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CLUTCHING

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PVT SYSTEM

Overview

> **⚠ CAUTION**
>
> Because of the critical nature and precision balance incorporated into the PVT system, it is absolutely essential that no attempt at clutch disassembly and/or repair be made without factory authorized special tools and service procedures. Polaris recommends that only authorized service technicians that have attended a Polaris-sponsored service training seminar and understand the proper procedures perform adjustments or repairs.

The Polaris drive system is a centrifugally actuated variable speed belt drive unit. The drive clutch, driven clutch, and belt make up the torque converter system. Each clutch comes from the factory with the proper internal components installed for its specific engine model. Therefore, modifications or variations of components at random are never recommended. Proper clutch setup and adjustments of existing components must be the primary objective in clutch operation diagnosis.

Drive Spring

The drive spring opposes the shift force generated by the clutch weights, and determines the neutral RPM, engagement RPM, and wether the engine RPM remains flat, rises, or falls during shift out. When changing only the drive spring, installing a spring with a lower pre-load rate will result in a lower engagement RPM speed, while installing a spring with a higher pre-load rate will result in a higher engagement RPM.

Clutch Weight

The clutch weights generate centrifugal force as the drive clutch rotates. The force generated changes in relation to the engine RPM and with specified weight of each clutch weight. When changing only the clutch weights, a lighter weight will result in a higher engagement RPM, lower shifting force, and higher shift out RPM. Installing heavier weights has the opposite effect

Neutral Speed

Engine RPM when the force generated by the clutch weights is less than the pre-load force generated by the drive spring. In this mode, the drive clutch is disengaged from the belt.

Engagement RPM

Engine RPM when the force generated by the clutch weights overcomes the drive spring pre-load force and the moveable sheave begins to close or “pinch” the drive belt. The engagement mode continues until no more belt slippage occurs in the drive clutch. Once enough belt engagement is achieved, the sled will accelerate along the low ratio line until the drive clutch up shift force overcomes the opposing shift force generated by the driven clutch.

Shift Out Over-Rev

Engine RPM that spikes above the desired operating RPM speed. The shift out RPM should come down to the desired operating RPM, but never below, after the driven clutch begins to open.

Shift Out RPM

Engine RPM at which the up shift force generated by the drive clutch overcomes the shift force within the driven clutch. In this mode, the drive clutch will move the belt outwards, and the driven clutch will allow the drive belt to be pulled down into the sheaves.

During WOT operation, the shift out RPM can be seen as the maximum, sustained RPM displayed on the tachometer. The shift out RPM should be the same RPM as the recommended engine operating RPM. If the shift out RPM is above the recommended engine operating RPM, install heavier drive clutch weights. If the shift out RPM is below the recommended engine operating RPM, install lighter drive clutch weights.

The shift out RPM should remain constant during both the upshift and back shift modes.

Driven Spring

A compression spring (Team driven clutch) or torsional spring (Polaris P-85 driven clutch) works in conjunction with the helix, and controls the shift rate of the driven clutch. The spring must provide enough side pressure to grip the belt and prevent slippage during initial acceleration. A higher spring rate will provide more side pressure and quicker back shifting but decreases drive system efficiency. If too much spring tension exists, the driven clutch will exert too much force on the belt and can cause premature belt failure.

Back-Shifting

Back-shifting occurs when the track encounters an increased load (demand for more torque). Back-shifting is a function of a higher shift force within the driven clutch then within the drive clutch. Several factors, including riding style, snowmobile application, helix angles, and vehicle gearing determine how efficient the drive system back-shifts. The desired engine operating RPM should never fall below 200 RPM of engine operating RPM, when the drive system back-shifts.

Final Gearing

The final drive gear ratio plays an important role in how much vehicle load is transmitted back to the helix. A tall gear ratio (lower numerical number) typically results in lower initial vehicle acceleration, but a higher top-end vehicle speed. A lower gear ratio (higher numerical number) typically results in a higher initial vehicle acceleration, but a lower top-end vehicle speed.

Choosing the proper gear ratio is important to overall drive system performance. When deciding on which gear ratio to use, the operator must factor in the decision where the snowmobile will be ridden, what type of riding will be encountered, and the level of performance the operator hopes to achieve.

Gearing a snowmobile too low for extended high-speed runs may cause damage to the drive belt and drive system, while gearing a snowmobile too high for deep-snow, mountain use may cause premature belt and clutch wear.

Typically, it is recommended to gear the snowmobile with a slightly higher ratio than the actual top speed the snowmobile will ever achieve.

1:1 Shift Ratio

A 1:1 shift ratio occurs when the drive clutch and the driven clutch are rotating at the same RPM.

The mathematical vehicle speed for a given gear ratio at a 1:1 shift ratio is represented in the chaincase gearing charts located in the Final Drive Chapter.

Low / High Ratio

Low ratio is the mechanical position when the drive belt is all the way down into the drive clutch, and all the way out on the driven clutch. High ratio represents when the drive belt is all the way out on the drive clutch, and all the way in on the driven clutch.

Driven Helix / Ramp

The helix cam is the primary torque feedback component within the driven clutch, regardless of driven clutch type. The beginning angle of the helix must transmit enough torque feedback to the moveable sheave in order to pinch the drive belt while minimizing belt slip. The flatter or lower the helix angle, the more side force will be exerted on the moveable sheave, while the steeper, or higher the helix angle, the less side force will be exerted on the moveable sheave.

GENERAL INFORMATION

Special Tools

Clutch Tools

Standard Offset Alignment Tool	PS-46998
Team LW Offset Alignment Tool	PS-47477
◆500, 600, 700 Domestic and 4 Stroke Engine Clutch Puller	2872085
◆Fuji Engine Clutch Puller	2872084
Replacement Handle for ALL Clutch Pullers	5020326
◆Drive Clutch Holding Wrench	9314177-A
Strap Wrench	PU-45419
Replacement Strap	305085
Drive Clutch Spider Nut Socket	2870338
Drive Clutch Spider Removal and Spider Installation Tool	2870341-A
Pin Centering Tool	2870401
Clutch Pin Installation Tool	2870402
Clutch Pin Punch	2870507
◆Tapered Reamer for Drive Clutch Bore	2870576
◆Roller Pin Tool	2870910-A
◆Drive Clutch Button Removal Tool	2870985
◆Clutch Bushing Replacement Tool Kit	2871025
◆Primary Clutch Compression Tool	8700220
◆Clutch Holding Fixture	2871358
◆Clutch Compression Tool	8700220
◆Spider Assembly Tool	8700221
◆Clutch Compression Tool Extensions for TEAM driven	PS-45909
◆Clutch Pilot Tool (used with the 2871358 to compress the clutch)	PU-45779
◆Drive Clutch Compression Tool (Compresses drive clutch without removing clutch from engine.)	2871173
◆Drive Clutch Reamer (29mm bore, 28mm bore depth)	2870576
◆Drive Clutch Reamer (29mm bore, 35mm bore depth)	PS-48587
◆Drive Clutch Reamer (31mm bore, 42mm bore depth) 2007 600 & 700 CFI Engines	PS-48584

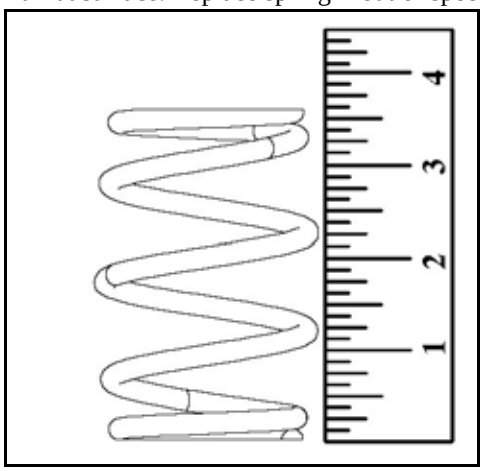
Drive Clutch Springs

Drive Clutch Springs

PART NUMBER	COLOR	WIRE DIAMETER (inches)	FREE LENGTH +/-.125”	FORCE LBS.@2.50” - 1.19” (+/- 12 LBS.)	LOAD RATE (lbs./ inch)
7041021	No paint color	.157”	4.14	70-130	44
7041022	Black	.140”	4.25”	44-77	25
7041063	Purple	.168	4.37	75-135	53
7041062	Silver	.207	3.12	75-243	151
7041065	Pink	.177	4.69	112-200	64
7041060	Orange	.196	3.37	70-199	98
7041083	Red	.192	3.77	120-245	94
7041102	Yellow	.192	2.92	44-185	105
7041061	Brown	.200	3.14	69-212	109
7041132	White	.177	2.92	34-141	81
7041168	Green	.177	3.05	42-142	76
7041148	Gold	.207	3.25	100-275	133
7041150	Red/White	.192	3.59	100-220	91
7041286	Silver/Gold	.218	3.05	77-240	163
7041080	Blue	.207	3.55	120-300	137
7041781	Dark Blue/White	.225	3.42	120-310	145
7041945	Almond	.218	3.65	140-330	145
7041645	Almond/Gold	.207	4.00	150-290	107
7041818	Black/White	.218	3.52	140-320	137
7041816	Almond/Black	.200	3.75	165-310	111
7041922	Almond/Blue	.218	3.75	150-310	122
7041988	Almond/Red	.207	4.27	165-310	110
7042083	Black/Green	.218	3.38	120-340	168
7043076	Black - 3076	.225	2.67	40-340	229
7043120	Black - 3120	.225	2.78	60-340	213
7043077	Black - 3077	.255	2.90	80-340	198
7043121	Black - 3121	.255	3.05	100-340	183
7042287	Black - 2287	.207	3.40	110-290	137

Spring Free Length

Measure the drive and driven spring free length with the spring resting on a flat surface. Replace spring if out of specification.



In addition to proper free length, the spring coils should be parallel to one another when placed on a flat surface. Distortion of the spring indicates stress fatigue. Replacement is required.

⚠ 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

Drive Clutch Weights

Full Tail Weights

WEIGHT	GRAMS	PART NUMBER
S43H	43	1321849
S45H	45	1321850
S47H	47	1321851
S49H	49	1321730
S51H	51	1321731
S53H	53	1321759
S55H	53	1322004

10 Series Weights

WEIGHT	GRAMS(+/- 1g)	PART NUMBER
10M-R Bushed	44	1321530
10M-W Bushed	46	1321527
10M Blue Bushed	47.5	1321529
10M Bushed	49.5	1321531
10 Bushed	51	1321531
10 AL Bushed	53	1321589
10-54	54	1321685
10-56	56	1321684
10-58	58	1321588
10-60	60	1321587
10-62	62	1321586
10-62M	61.5	1321614
10-64	64	1321585
10-64M	63.5	1321615
10-66	66	1321584
10-68	68	1322427
10-70	70	1322414
10-72	72	1322428
10-74	74	1322429
10-76	76	1322585
10-78	78	1322586

11 Series Weights

WEIGHT GRAMS(+/- .8g)	PART NUMBER
11-40	1322593
11-42	1322592
11-44	1322591
11-48	1322590
11-50	1322589
11-52	1322595
11-64	1322604
11-66	1322559
11-68	1322558
11-70	1322523
11-72	1322524
11-74	1322525
11-76	1322526

Non-ER LWT Driven Helixes

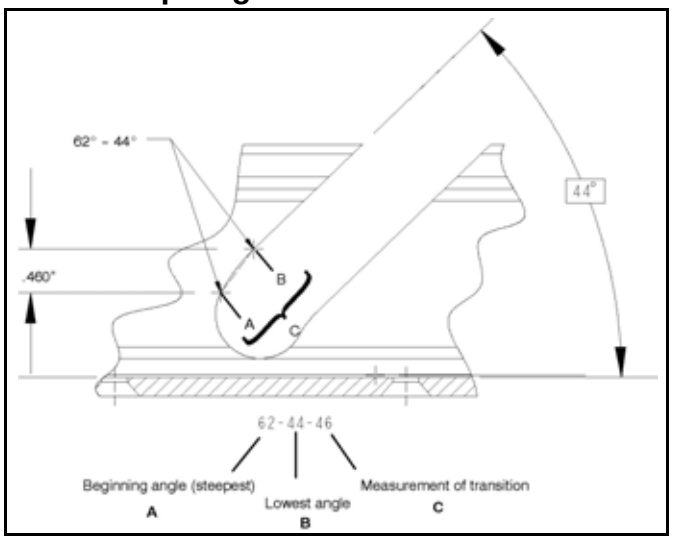
Non-ER LWT Driven Helixes

PART NUMBER	DESCRIPTION
5135438	70/44 - .46 / 66/44 - .46
5135480	64/38 - .65 / 64/38 - .46
5135486	62/40 - .46 / 64/40 - .55
5135521	74/50 - .46 / 74/48 - .46
5135522	74/44 - .46 / 74/40 - .46
5135523	70/50 - .46 / 70/48 - .46
5135524	70/44 - .46 / 70/40 - .46
5135525	66/50 - .46 / 66/48 - .46
5135526	66/44 - .46 / 66/40 - .46
5135537	64/38 - .65

Team Helix Options with PERC

PART NUMBER	DESCRIPTION
5133687	(58/44-46) ER
5133771	(58/42-46) ER
5133772	(62/46-46) ER
5133773	(62/42-46) ER
5133784	(58/40-46) ER
5133785	(62/40-46) ER
5133786	(62/44-46) ER
5133787	(62/48-46) ER
5133788	(60/44-46) ER
5133789	(60/46-46) ER

Team Ramp Angles



The Team helix is designated by the angle and length of the angle on the back side of the ramp. The first number (A) designates the starting angle of the ramp. The second number (B) designates the finish angle. The last number (C) is the transition distance (in inches) between the starting and finish angles.

⚠ CAUTION

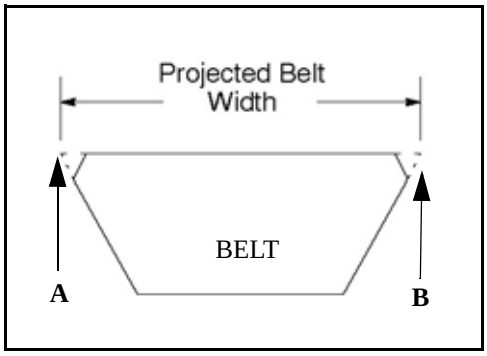
Do not install a non-ER helix on a Perc-equipped snowmobile where the engine changes directions.

Team Driven Springs

TEAM Driven Springs

PART NUMBER	COLOR	WIRE DIAMETER	LOAD @ 2.2″(lbs)	LOAD @ 1.1″(lbs)	Rate (Lbs. per inch)
7042181	Black/Yellow	.200	145	208	56
7043058	Red/Black	.218	140	240	90
7043059	Red/Green	.218	120	220	90
7042066	Green/Black	.200	135	198	56
7043061	Red/Silver	.207	125	175	45
7043062	Red/Yellow	.207	100	150	45
7043057	Red/Blue	.218	140	200	54
7043063	Black/Red	.218	155	222	65
7043064	Blue/Black	.218	123	203	73
7043060	Red/White	.218	100	200	91
7043069	Red/Pink	.235	140	260	110

Belt Inspection



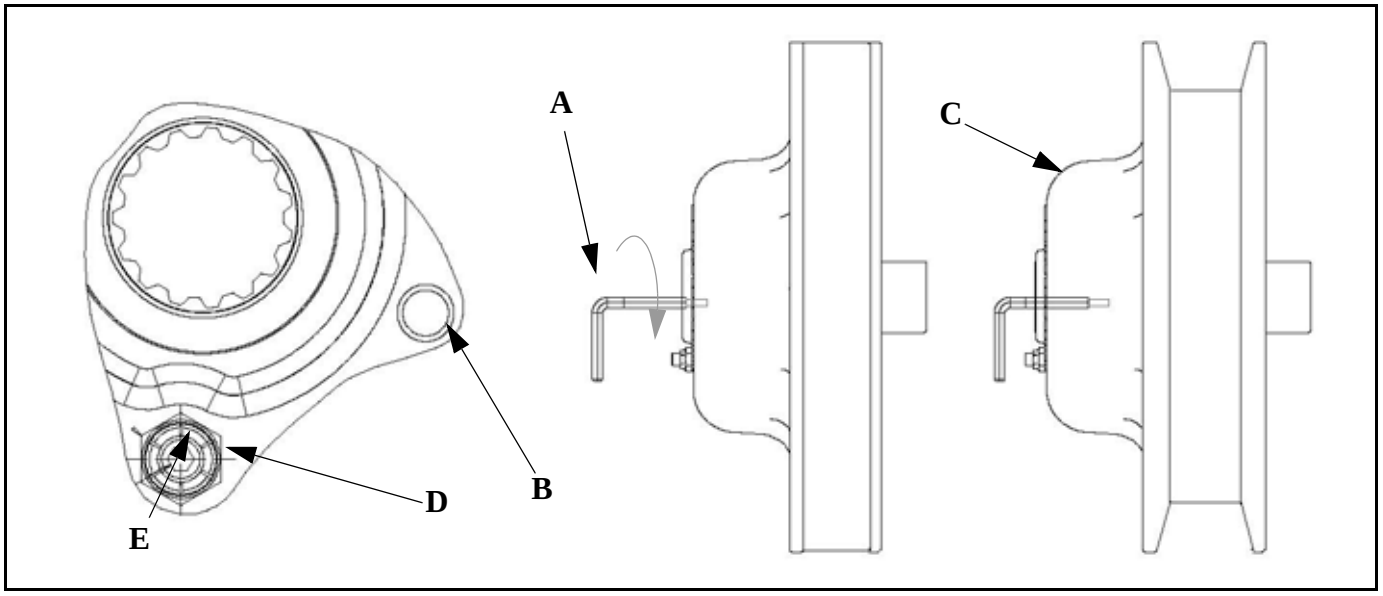
1. Measure the belt width and replace it if it is worn severely. Generally a belt should be replaced if the clutches can no longer be adjusted to provide the proper belt deflection.
   - Project the side profiles and measure from corner to corner.
   - Place a straight edge on each side of the drive belt and measure the distance where the straight edges intersect at the top (A,B).
2. Inspect the belt for loose cords. missing cogs, cracks, abrasions, thin spots or excessive wear spots. Replace if necessary.
3. Inspect the 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. Example would be taking off while the track is frozen to the ground. Remember to always warm up the track and free it from the ground.

Belt Wear / Burn Diagnostics

Table 6-1: Belt Wear / Burn Diagnostics

POSSIBLE CAUSE	SOLUTION
Driving at or about engagement RPM for extended periods of time in any type of snow condition.	Drive at higher RPM if possible. Gear the machine down. Make sure belt deflection is at 1 1/4” to achieve optimum starting ratio.
Cold weather startups	Be patient. Warm up engine at least 5 minutes or until it readily responds to throttle input. For the quickest most efficient drive away in extreme cold weather, take drive belt off machine and bring it in to a warm environment. Break skis and track loose from the snow. Engage throttle aggressively for short durations for initial cold drive away
Towing another machine at or about engagement RPM	When possible, do not go in deep snow when towing another machine. Use fast, effective throttle to engage the clutch. Not all machines are intended for pulling heavy loads or other machines.
Spinning track while vehicle is stuck (high RPM, low vehicle speed, high ambient temp. Example: 8000 RPM, 10mph actual vehicle speed and 60 m.p.h. indicated on speedometer.	Lower the gear ratio. Remove windage plates from driven clutch. If possible, move to better snow conditions and reduce RPM. Avoid riding in very high ambient temperatures
Ice and snow piled up between track and tunnel overnight or after stopping for a long period of time (enough to re-freeze the snow).	Break loose snow and ice under tunnel. Allow longer than normal warm-up. Allow belt to warm sufficiently and increase grip ability on clutch sheaves. Use fast, effective throttle when engaging clutch.
Poor running engine (Bog, Miss, Backfire, etc.)	Maintain good state of tune including throttle and choke synchronization. Check for fouled spark plug(s). Check for foreign material in carbs. Make sure no water or ice is present in the fuel tank, lines, or carburetors.
Loading machine on trailer	Use caution when loading machine. Carbide skags may gouge into trailer and prevent drive train from spinning freely. Use enough speed to drive completely onto trailer. If machine cannot be driven completely onto trailer, it may need to be pulled or pushed to avoid belt wear / burning.
Clutch malfunction	Check for correct clutch components, or damage on the clutch
Slow, easy belt engagement - easing on the throttle	Use fast, effective throttle to engage the clutch.

Drive Belt Removal



NOTE: Turn the key to the "OFF" position and allow the engine to come to a complete stop.

Always install a used belt in the same direction as it was installed before removing. When installing a new belt, position the identification numbers so they can read when viewed from the left-side of machine.

1. Remove the clutch guard / air intake.
2. Position the thread hole (B) so that it is in the 10:00 or 2:00 position.
3. Insert the "L" wrench (A) into the threaded hole (B) located on the driven clutch, and turn it clockwise until the clutch sheaves are in the open position (C).

NOTE: L wrench PN 2874857

4. Remove the drive belt.

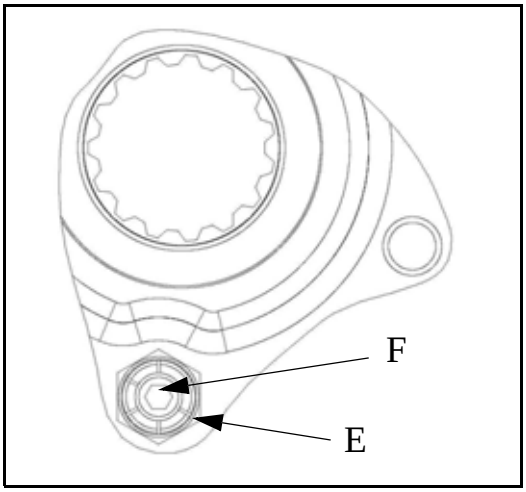
Drive Belt Installation

1. With the "L" wrench inserted into the threaded into hole (B) and the sheaves in the open position (C), install the drive belt.

NOTE: Install belt so that the numbers can be read correctly on the left side of the machine.

2. Turn the "L" wrench counter-clockwise until the driven clutch sheaves are in the closed position. "Wiggle" the belt to remove slack while removing the wrench.
3. Reinstall the clutch guard / air intake.

Adjusting Belt Deflection



1. Loosen the jam nut (E).
2. Using an 1/8” Allen head wrench, turn the stud (F) counter-clockwise to decrease belt deflection and clockwise to increase belt deflection.
3. When the proper belt deflection is achieved torque the lock nut (E) to 90-110 in-lb. (10-12Nm).

Drive Belts

Part Number	Belt Width (Projected)* in/mm	Side Angle Overall*	Center to Center in/ cm*	Outer Circumference in/cm	Notes
3211042	1.375/34.9	32_	12/30	47.25/120	Common production belt.
3211045	1.375/34.9	32_	12/30	47.125/119.7	Close tolerance version of 3211042
3211058	1.250/31.75	28_	11/28	43.313/110	P-90 belt
3211059	1.250/31.75	28_	12/30	45.125/114.6	Longer P-90 belt
3211061	1.375/34.9	32_	12/30	47.188/119.9	CVT version of 3211045
3211065	1.438/36.5	28_	12.5/31.75	48.375/122.9	CVT Double Cog Storm belt
3211066	1.375/34.9	28_	12/30	47.25/120	Double Cog-CVT- thicker than the 3211070.
3211067	1.375/34.9	28_	12/30	47.25/120	“Sticky compound” Good for low horsepower trail riding. Drag racing belt.
3211070	1.375 / 34.9	28_	12/30	47.25/120	Late model P-85 systems
3211073	1.438 / 36.5	28_	12.5/31.75	48.375/122.9	“Sticky compound” Good for low horsepower trail riding. Drag racing belt.
3211074	1.438 / 36.5	28_	12/30	47.625/121	“Sticky compound” Good for low horsepower trail riding. Drag racing belt.
3211075	1.438 / 36.5	28_	12/30	47.625/121	Double Cog CVT
3211080	1.438 / 36.5	28_	11.5/29.2	46.625/118.4	Double Cog CVT version of 3211078
3211078	1.438 / 36.5	28_	11.5/29.2	46.62 / 118.4	Standard Drive Belt
3211099	1.490 / 37.84	28_	11 / 27.9	46.06 / 116.9	Double Cog CVT
3211111	1.537 / 39	28_	11.5/29.2	47.67 / 121	Super Cog Belt
3211115	1.46 / 37.1	26_	11.5 / 29.2	46.77 / 118.8	Raw Edge Double Cog Variable Speed Drive Belt

*Belt dimensions are given in nominal dimensions. There is a +/- variance for all critical dimensions. Clutch set up must be inspected when a new belt is installed and, if necessary adjusted.

The drive belt is an important component of the converter system. In order to achieve maximum efficiency from the converter, drive belt tension (deflection), clutch offset, and alignment must be adjusted properly.

Belt PN 3211115 Break -In Procedure

This is a new belt for 2007 and is used o the 600 RMK, Dragon RMK and the Dragon IQ sleds. This belt can be used on any sled that has a 11.5" (29.2cm) center to center distance or uses a 3211080 belt.

The manufacturing process of this belt requires a special break-in procedure.

1. Clean the clutch sheaves with isopropyl alcohol.
2. Position the new belt so that the number of the belt face you while you are standing on the clutch side of the machine.
3. Drive the unit for 20-50 miles and vary throttle speed without exceeding half throttle and avoid aggressive acceleration.

PVT SYSTEM ADJUSTMENTS

Clutch Alignment / Offset

The engine is mounted in the bulkhead so the drive and driven clutches self-align under high torque loads.

Offset is controlled by the number of washers installed on the jackshaft behind the driven clutch.

1. Remove drive belt.
2. Install the correct alignment tool depending on the type of driven clutch installed on the snowmobile.

TOOL PART NUMBER	APPLICATION
PS-47477	Light Weight (LW) Team Driven

NOTE: A standard alignment tool will not work with a Team LW driven clutch. Likewise, a LW alignment tool will not work with a standard Team driven clutch. A Team LW driven clutch can be identified as having 24 cooling fins.

3. The optimum setup is when the front and rear of the tool touch the driven clutch. No gap should be present in the front, and the rear clearance should not exceed .060" (3mm).

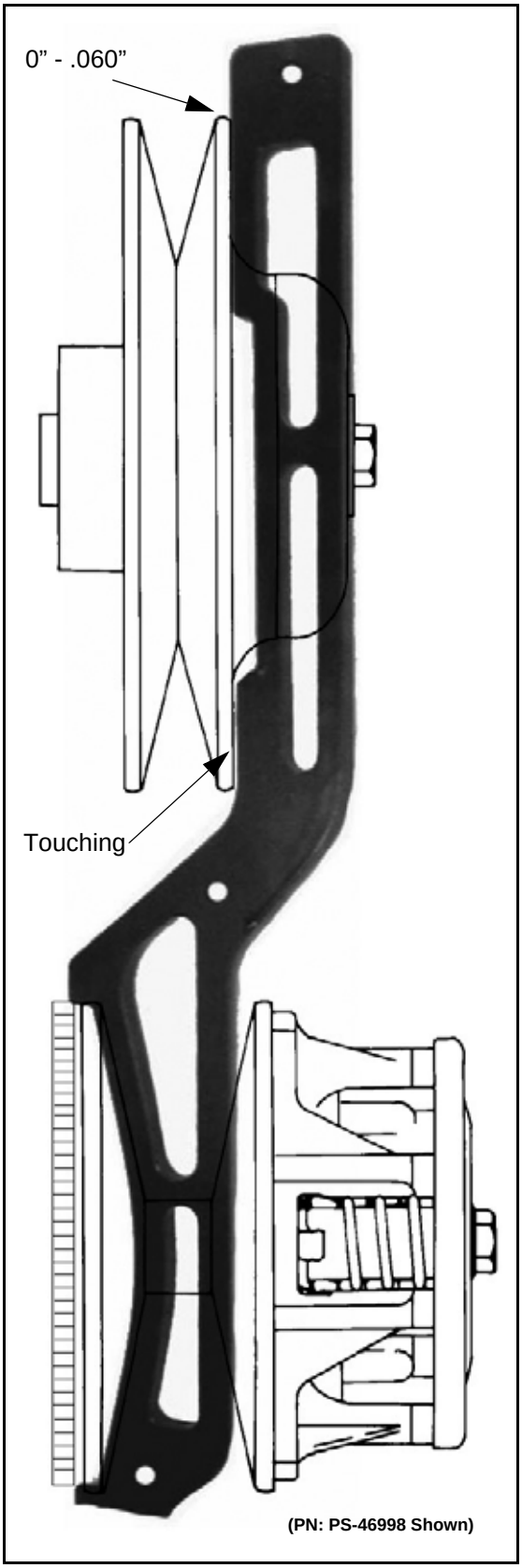
NOTE: If the front of the alignment bar does not touch the driven sheave, the maximum clearance cannot exceed .025″.

Offset Adjustment

1. Determine direction driven clutch needs to be adjusted.
2. Remove driven clutch retaining bolt, and remove driven clutch.
3. Add or remove washers from the jackshaft between the driven clutch and jackshaft bearing to achieve proper offset.
4. After adjusting offset, add or remove shim washers from the retaining bolt to provide a +/- 0.030” (.75mm) of float on the jackshaft.

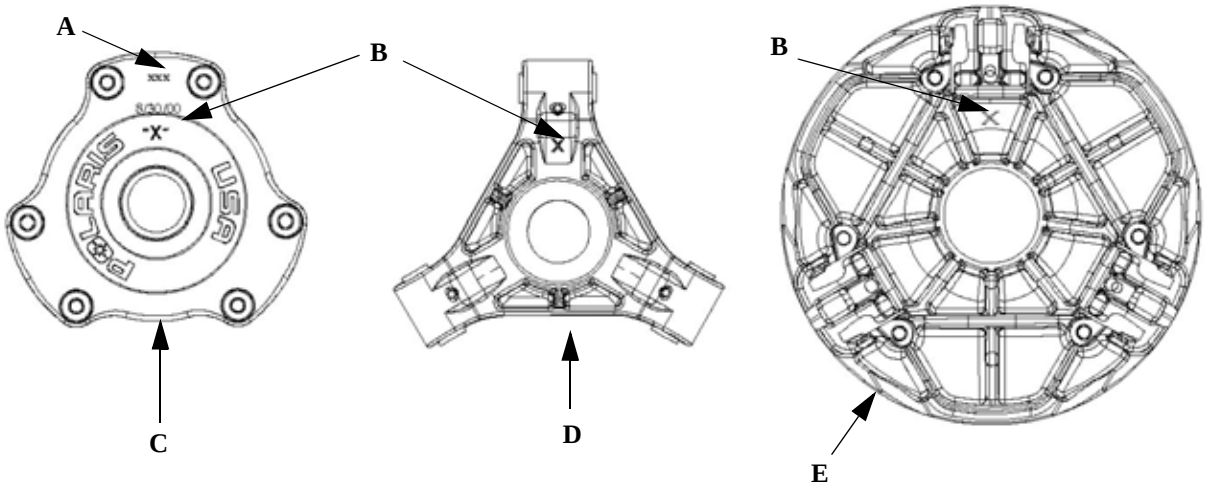
⚠ CAUTION

Always verify the driven clutch floats on the jackshaft after securing the fastener. The jackshaft bearing will fail due to side-loading if the driven clutch is not allowed to float.



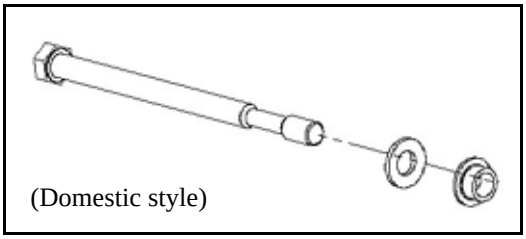
DRIVE CLUTCH

Identification



Every clutch will have the last three digits of the clutch part number etched on to the cover (A). The "X" (B) marking is an index mark where the clutch cover (C), clutch spider (D) and the stationary sheave (E) should line up when the clutch is assembled.

Drive Clutch Removal


(Domestic style)

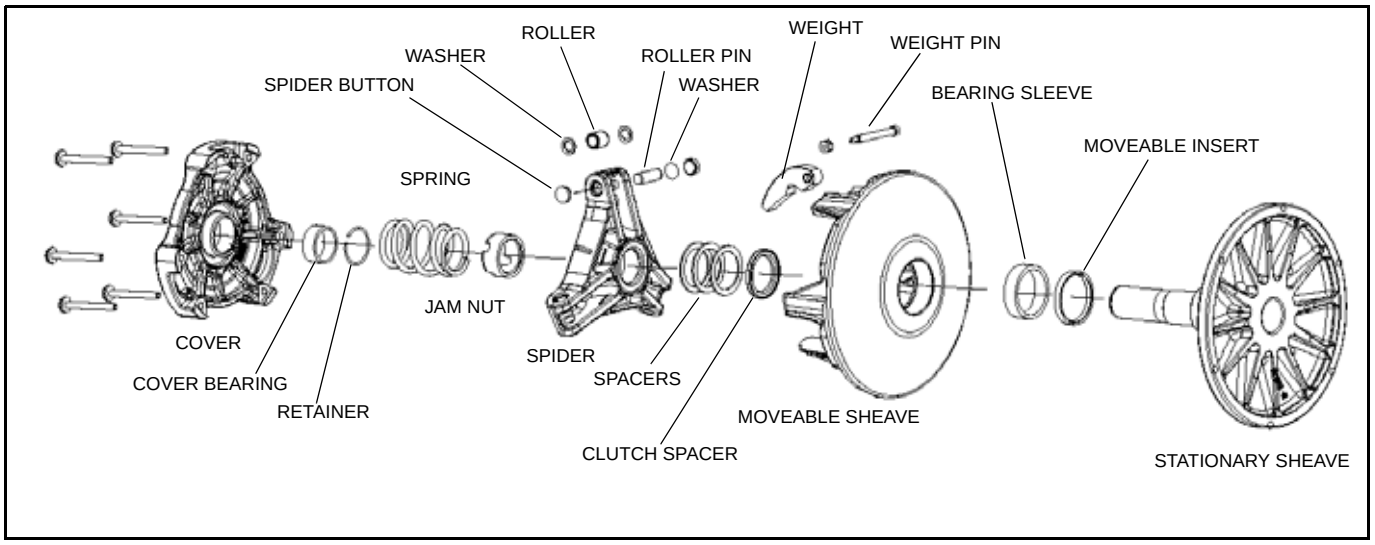
NOTE: All clutch tools can be found at the beginning of this chapter.

1. Remove the belt.
2. Place the clutch holding tool (PN 9314177-A) on the drive clutch.
3. Remove the drive clutch retaining bolt. Note the placement and number of washers on retaining bolt.
4. Insert the correct clutch puller into the retaining bolt hole.
5. Tighten the puller into the clutch. If the clutch does not come off, strike the clutch puller head with a hammer. If the clutch does not "pop" off, continue to tighten the clutch puller, and repeat this step.

⚠ CAUTION

Do not use an impact wrench to remove or install the clutch bolt or clutch puller. Damage to the clutch and/or crankshaft can occur.

Drive Clutch Disassembly



⚠ CAUTION

Wear eye protection when servicing the drive clutch. Sheaves must be marked to provide a reference point for dutch balance and spider indexing. If the sheaves are not marked and the spider washers are changed or misplaced, the clutch may be out of balance and damage to the clutch may result.

⚠ WARNING

Clutch spring is under extreme tension, use caution when disassembling the clutch.

1. In a straight line, mark the sheaves and the cover with a black marker or etched with a scribe.
2. Remove the clutch.
3. Place the drive clutch in the clutch compression tool (PN 8700220).
4. Compress the clutch in the compression tool, then secure the chain.
5. Evenly remove the cover fasteners. The cover bushing may be damaged if the cover is side-loaded or mis-aligned.
6. Carefully remove the tension from the compression tool.
7. Remove the cover and inspect the cover bushing. Replace if damaged or worn.

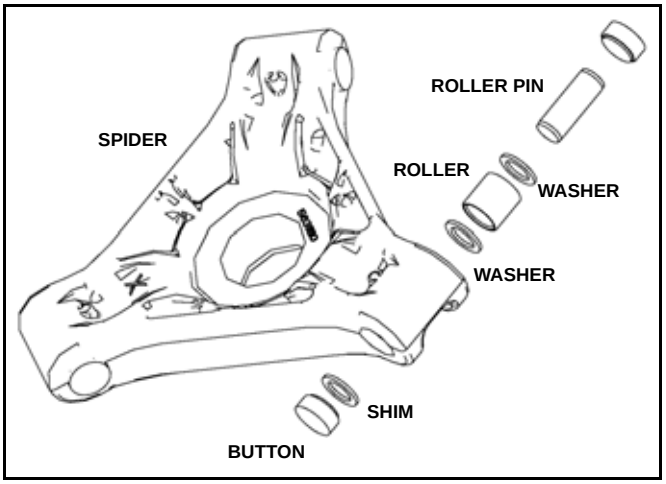
NOTE: Replace the cover bushing if the inside diameter is over 1.40″ (28.95mm)

8. Remove the spring.
9. Mount the drive clutch securely in a drive clutch holding fixture (PN 2871358).
10. Remove the jam nut in a counterclockwise direction (standard thread) using the drive clutch spider nut socket (PN 2871358).
11. Install the spider removal tool (PN 2870341), and remove the spider in a counterclockwise direction (standard thread).
12. Measure the total thickness of the spacer washers that are installed on top of the clutch spacer. Record the thickness of these spacer washers.
13. Inspect both sheave surfaces for wear or damage.
14. Inspect the moveable sheave bushing for wear or damage.
15. Remove all three drive clutch weights.
16. Inspect each weight. The surface should be smooth, with no waves or galling. Place bolt inside weight to check flyweight bushing and pin surface for wear by rocking the weight back and forth.
17. Inspect all the rollers, bushings and roller pins by pulling a flat metal rod across the roller.
18. Roller can also be inspected by rolling with a finger to feel for flat spots, roughness, or loose bushing.

NOTE: The flyweight bushing is not replaceable. If flyweight bushing is damaged both the flyweight, pin and nut will need to be replaced.

19. Inspect to see if the roller and bushing are separating.
20. Bushing must fit tightly in roller.
21. Replace roller and pin if roller fails to roll smoothly (no flat spots) or if the bushing is loose or worn.

Roller Removal

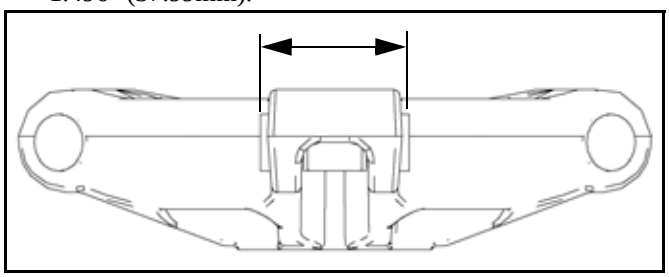


1. With the spider in a vise start removing the spider buttons by drilling a 0.18" hole in the center of a button on one side of the spider.
2. Place spider on a vise or in an arbor press.
3. Place a pin punch through the spider button hole and drive the opposite button and pin out.
4. Remove shims (if any are installed) and note their location.
5. Flip the spider over and tap out the holed button.

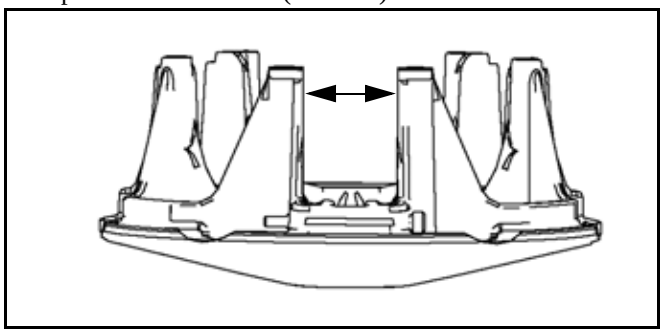
Roller Installation

NOTE: CAUTION: Use care to start the pin straight. Aluminum burrs could pass through into the roller bushing causing it to bind and stick. Also use care to make sure the roller remains aligned when the pin is driven through. The roller busing could be damaged causing premature wear and roller failure.

1. Drive pin into the spider leg.100" -.125" (0.25 - 0.32cm) beyond the first land of the spider leg.
2. Install one washer on the portion of the pin that is protruding from the spider leg.
3. Install new buttons into the spider
4. Place roller in spider leg and center it on the pin.
5. Place a second washer on the other side of the roller.
6. Place the spider on a vise.
7. Install pin centering tool (PN 2870401).
8. Drive the roller pin through the second land of the spider.
9. Repeat process for the other two rollers.
10. Measure the width of the spider leg with the buttons installed (9) and record the measurement. Specification is 1.496" (37.99mm).



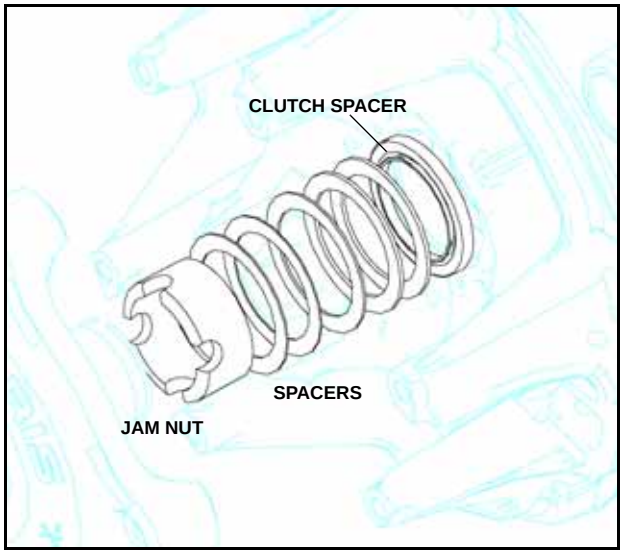
11. Measure the width of the moveable sheave towers. Specification is 1.50" (38.1mm).



12. Subtract the spider measurement form the tower measurement. The clearance between the spider buttons and the moveable sheave towers is .002" - .004" (.05 - .10mm).

Clutch Assembly

1. Assemble the rollers, bushings and roller pins if they were removed.
2. Install the head of the weight pin so that it is on the leading side of rotation. This will orientate the nut on the trailing side of rotation.
3. Torque weight pin to 30 in-lb. (3Nm).
4. Place the moveable sheave onto the stationary sheave.
5. Place the same number of spacers on top of the stepped spacer onto the shaft of the stationary sheave.



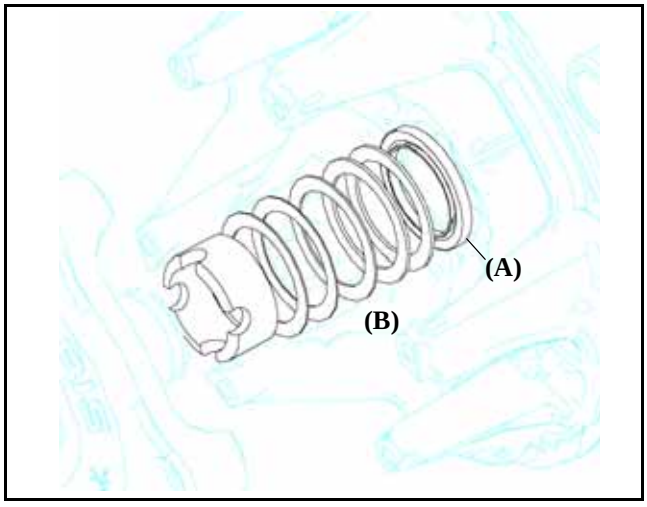
6. Thread the spider onto the stationary sheave shaft.
7. Index the spider. See “Spider Indexing” on page 6.18.
8. Using the spider tool (PN 2870341) torque to 200 ft.-lb. (276Nm).
9. Install the jam nut (6) onto the shaft and torque it to 235 ft.-lb. (324 Nm).
10. Place the drive spring on the shaft.
11. Place the cover onto the clutch and torque the cover fasteners to 90 in-lb. (10Nm).

NOTE: Do not allow side loading or mis-alignment of the cover or the bushing may become damaged.

Spider Indexing

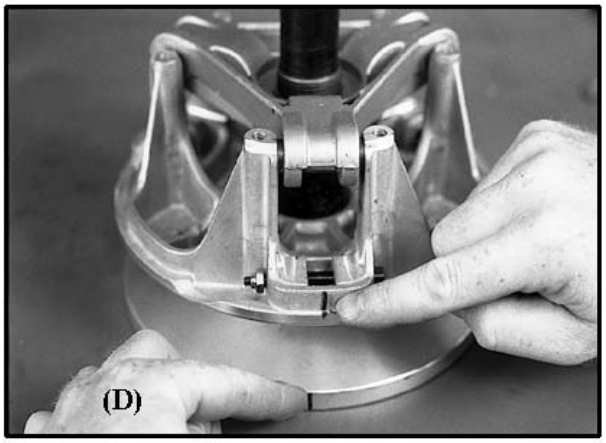
NOTE: Spider indexing effects belt to sheave clearance and clutch balance. Please read all procedures before proceeding.

1. Remove and disassemble clutch
2. Add or remove spider washers as required to achieve desired belt to sheave clearance. Make sure that the stepped washer (A) is on the bottom of the spacer stack (B). For example: If belt to sheave clearance is .020″ too large, removing one .020″ shim will position the movable sheave closer to the fixed sheave reducing belt to sheave clearance by .020″.
3. Place the correct number of spacer washers (B) beneath the spider. The following washers are available for fine tuning:
   - 5210752 - .020″ (.51mm)
   - 5242981 - .025″ (.63mm)
   - 5210753 - .032″ (.81mm)
   - 5210754 - .050″ (1.27mm)
   - Clutch Spacer - .130″ (3.3mm)



4. Install spider washer(s) and spider aligning the “X” with the moveable sheave’s “X”. Notice as the spider seat location is changed, the sheave marks made before disassembly no longer align (C). There are two ways to bring the sheave marks into alignment.



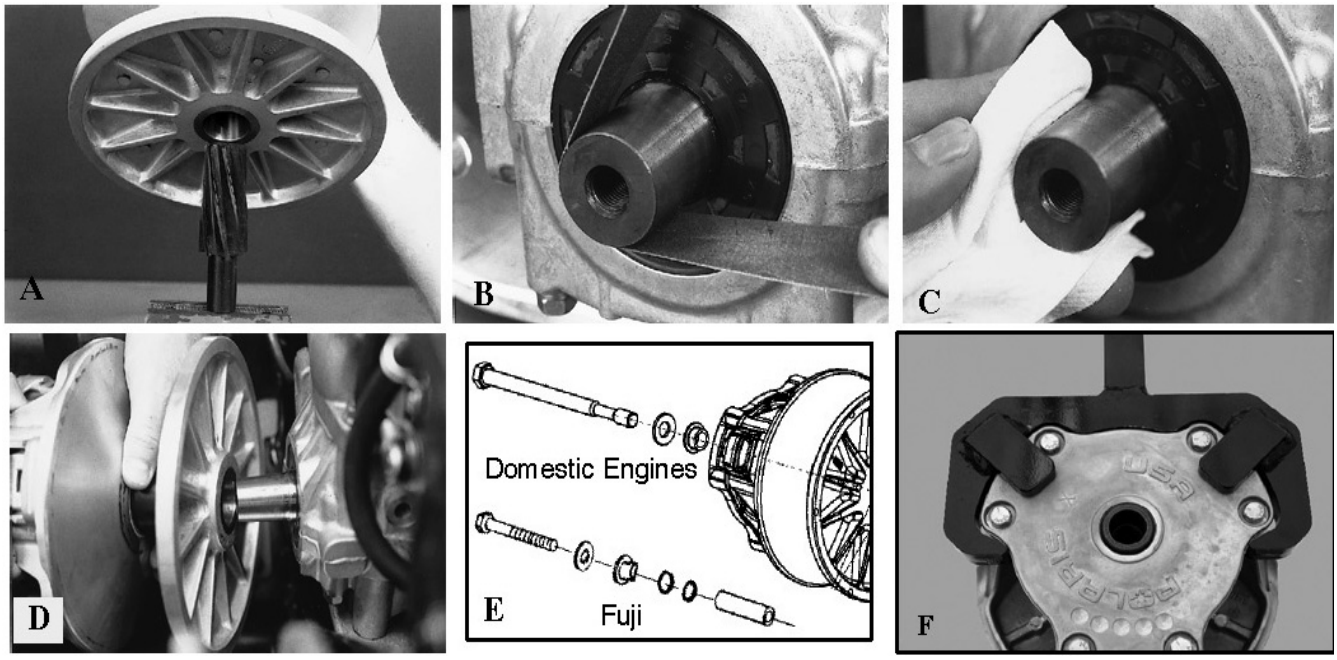


Vary the amount and thickness of spacer washers (washer thickness may vary slightly). Re-index marked spider leg to another tower. This can be done because spider has little effect on overall clutch balance.

Re-indexing the spider 1/3 turn clockwise, or 1 leg, will allow the realignment of the moveable and stationary sheaves as previously marked (D). For EXAMPLE: 0.020" or 0.032" (0.5 - 0.8mm) washer removed - re-index spider clockwise 1/3 turn.

NOTE: Alignment marks on the sheaves should be with in 1" (25.4mm) after final assembly and torquing.

Drive Clutch Installation



NOTE: Always clean the clutch taper before re-installing clutch on engine.

1. Place a clutch taper reamer (PN 2870576) in a vise (A) and lubricate the cutting edges with cutting oil. Clean the clutch taper by manually rotating the clutch clockwise on the reamer one or two revolutions. Only use the weight of the clutch and do not push down on the clutch while turning. This will clean up any galling or scoring of the bore taper.
2. Check crankshaft taper for galling or scoring. If necessary clean the taper evenly with 200 grit emery cloth (B).
3. The clutch taper and the crankshaft taper should be clean and dry. Do not use harsh cleaners which may cause clutch taper to corrode, or damage the crank seal.
4. Clean clutch taper with lacquer thinner or isopropyl alcohol (C).
5. Slide clutch onto crankshaft taper (D).
6. Install the retaining bolt with all spacers and washers or o-rings (E) that were on the bolt when it was removed.
7. Hold the clutch with the holding wrench (F) PN 931417-A. Re-check torque after first operation or test ride.
8. Torque retaining bolt to specification.
9. Run engine then re-torque the retaining bolt to specification.

Drive Clutch Bolt Torque

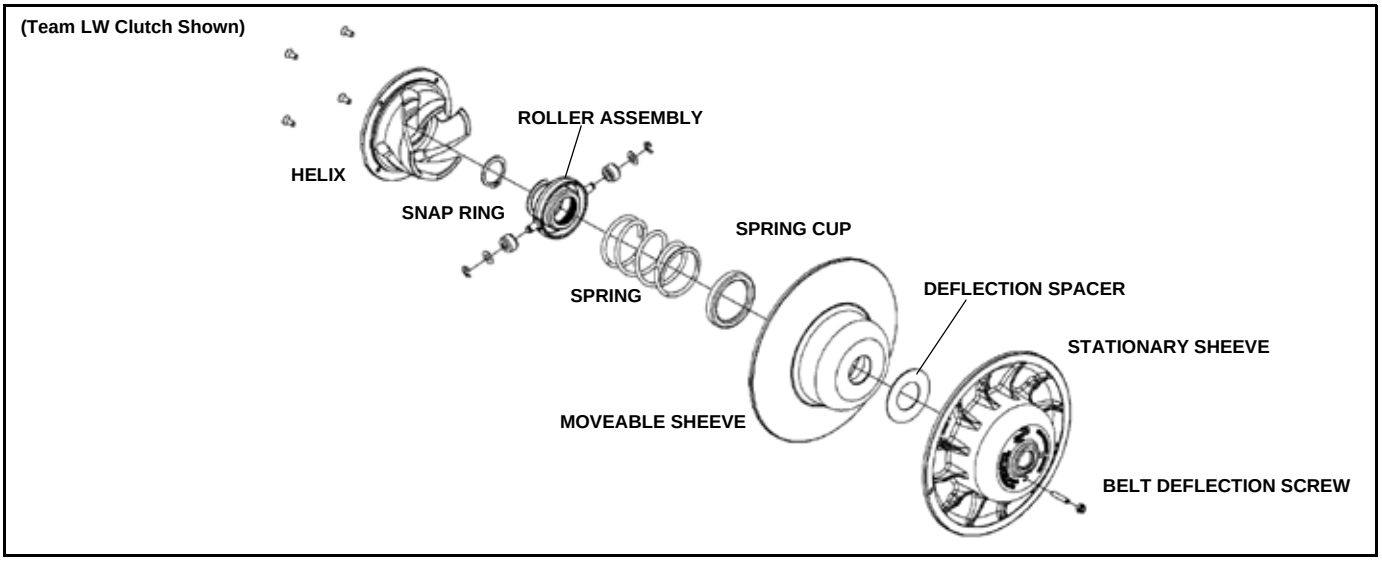
ENGINE	BOLT	TORQUE
Fuji	7/16-20	40-45 ft-lb (55-62N-m)
Liberty 440/500/600/ 700 carbureted	14mm	50 ft-lb (68N-m)
Liberty 600/700 CFI	14mm	80 ft-lb (108N-m)

⚠ CAUTION

Re-torque the drive clutch bolt after running the engine for several minutes.

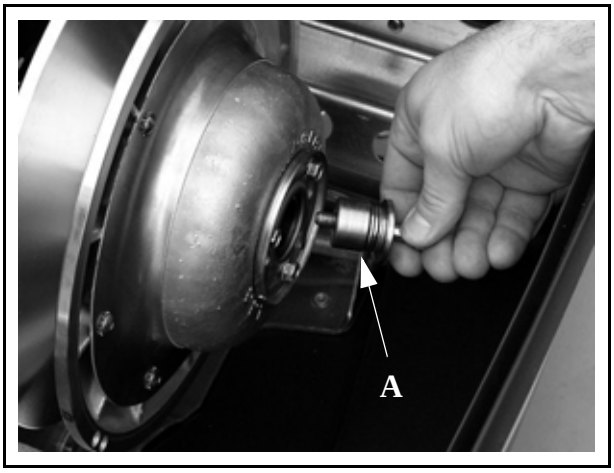
DRIVEN CLUTCH

Components



= T
Helix Fasteners = 60 - 80 In.Lbs. (7 - 9 Nm) Driven Clutch Retaining Fastener = 17 Ft.Lbs. (23 Nm)

Driven Clutch Removal

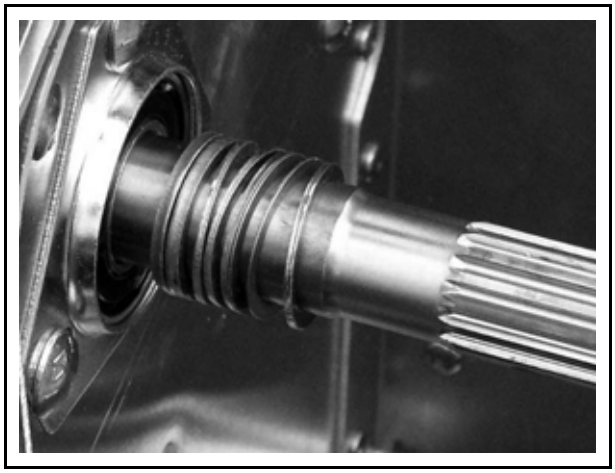


1. Remove the drive belt.
2. Apply and lock the parking brake.
3. Remove the driven clutch bolt and washers (A).

NOTE: Count the number and location of the spacer washers located on the fastener and behind the clutch.

4. Slide the driven clutch off the jackshaft.
5. Inspect the splines and replace jackshaft if damage is found.

Driven Clutch Installation



1. Install the driven clutch bolt with the same amount of washers at removal.
2. Torque the bolt to specification.
3. Check for correct belt deflection.

Driven Clutch Disassembly

1. Helix Removal:
   - Remove the fasteners securing the helix to the moveable sheave.
   - Using a flat-blade screwdriver, carefully pry the helix up and out of the sheave.
2. Install the clutch into the clutch compression tool, PN 8700220. Use the clutch compression extensions, PN PS-45909.

3. Compress the roller assembly to access the snap ring. Lock the clutch compression tool chain to hold the roller assembly down.
4. Carefully remove the snap ring.
5. Slowly release the compression tool.

⚠ WARNING

Wear eye protection when removing and installing the roller assembly.

6. Disassemble the clutch components. Replace damaged or worn components.

Driven Clutch Assembly

1. Clean the components with clutch cleaner. Reassemble the clutch components. Reference the illustration for order of assembly.
2. Visually align the wide notch on shaft with the wide opening on the roller assembly. Place the roller assembly on the spring.
3. While keeping the roller assembly centered on the shaft, compress the roller assembly and spring down into the moveable sheave enough to expose the snap ring groove.
4. Install the snap ring, then release the compression tool.
5. On dual-angled Team helixes, locate the desired angles etched on the helix cover. Install the helix so that the desired ramps fit around the two rollers. Push the helix down into the sheave, while keeping the fastener holes aligned.
6. Torque the helix fasteners to specification.

Belt to Sheave Clearance Inspection

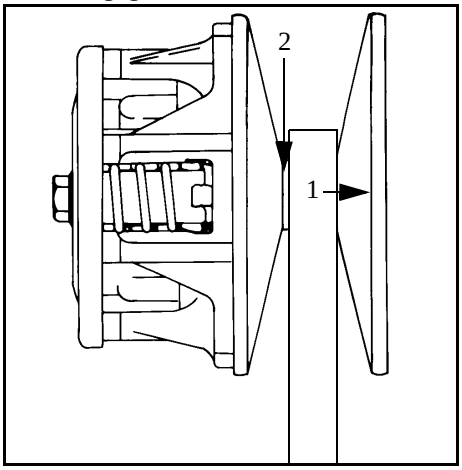
The distance between the belt and the moveable sheave on the drive clutch is very important. This distance controls the starting ratio (lowers starting ratio is most preferable) and the position of the clutch weight to engine RPM.

The distance between the belt and movable sheave should be as close to .020" (.5 mm) as possible with out creating drag on the belt when positioned around the hub at the bottom of the sheaves.

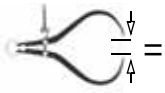
1. Force the belt (1) to the stationary sheave (toward engine) of the drive clutch.

NOTE: Measure total belt to sheave clearance with a new belt installed.

2. Install a feeler gage between the belt and moveable sheave



3. Distance should be .005" - .035" (.1 - .9 mm)

 **= In. / mm.**

Belt to Sheave Clearance: .005" - .035" (.1 - .9 mm)

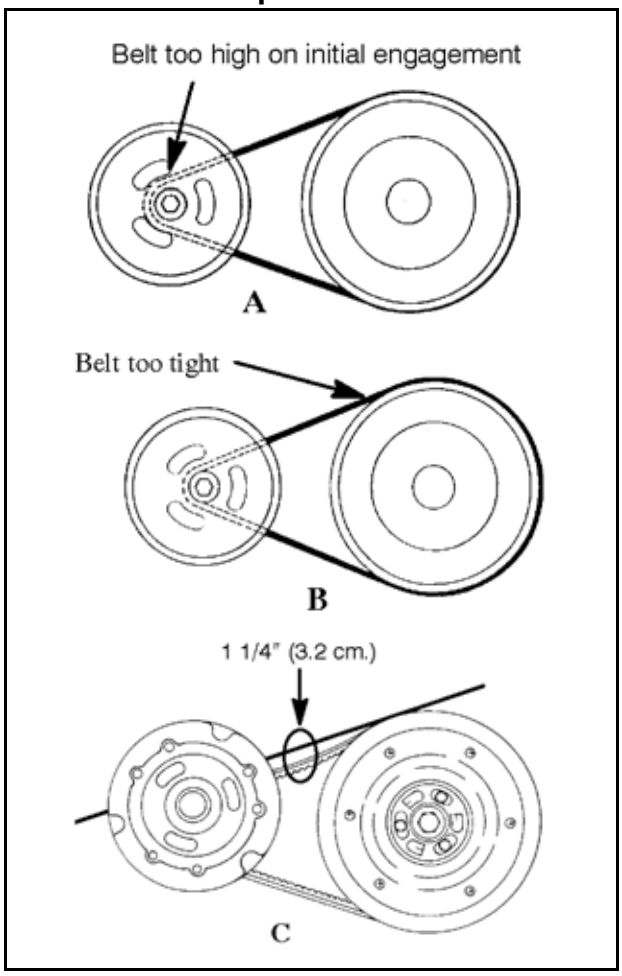
Belt to Sheave Clearance Adjustment

Belt to Sheave clearance can be adjusted in two ways:

1. Try several new belts to achieve proper clearance.
2. You can add or remove shims from under the spider to increase or decrease the belt to sheave clearance. See “Spider Indexing” on page 6.18.

NOTE: Belts with various widths will affect belt deflection since they will fit differently in the driven clutch. See “Belt Deflection Inspection” on page 6.23.

Belt Deflection Inspection



Belt deflection is critical for optimum belt performance and belt life. It should be checked at 500 miles (800km) and then in 1000 mile (1600km) increments after that.

Too much belt deflection is when the belt is too long or the center distance is too short. The initial starting ratio will be too high, resulting in performance loss. This is due to the belt rising too high in the drive clutch sheaves upon engagement (A).

Not enough belt deflection (B) is when the belt is too short or the center distance is too long. The initial starting ratio will be too low. In addition, the machine may creep when the engine idles, causing damage to the internal face of the drive belt.

NOTES

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FINAL DRIVE/BRAKES

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GEARING CHARTS

Chaincase Speed Charts

Top Gear	26	26	26	26	25	25	25	25	25	25	25	25	25	24	24	24	24	24
Bottom Gear	35	36	39	40	36	37	38	39	40	41	42	43	44	37	38	39	40	41
7.92	NR	NR	NR	NR	NR	74	74	NR	76	76	NR	NR	NR	74	74	74	NR	76
8.373	NR	76	NR	78	76	76	NR	NR	78	78	NR	NR	80	NR	NR	NR	NR	78
11.35	92	92	94	94	92	92	NR	NR	94	94	NR	NR	NR	92	92	NR	NR	94
8.424	NR	NR	78	NR	NR	NR	NR	NR	78	NR	NR	NR	NR	NR	NR	NR	78	78
Gear Ratio	1.35	1.38	1.50	1.54	1.44	1.48	1.52	1.56	1.60	1.64	1.68	1.72	1.76	1.54	1.58	1.63	1.67	1.71
Jackshaft RPM	MPH																	
6000	96	93	86	84	89	87	85	83	81	79	77	75	73	84	81	79	77	75
6250	100	97	89	87	93	91	88	86	84	82	80	78	76	87	85	83	81	79
6500	104	101	93	91	97	94	92	89	87	85	83	81	79	91	88	86	84	82
6750	108	105	97	94	101	98	95	93	91	88	86	84	82	94	92	89	87	85
7000	112	109	100	98	104	102	99	96	94	92	89	87	85	98	95	93	90	88
7250	116	112	104	101	108	105	102	100	97	95	93	91	88	101	98	96	93	91
7500	120	116	107	105	112	109	106	103	101	98	96	94	92	104	102	99	97	94
7750	124	120	111	108	116	112	110	107	104	101	99	97	95	108	105	102	100	97
8000	128	124	115	112	119	116	113	110	107	105	102	100	98	111	109	106	103	101
8250	132	128	118	115	123	120	117	114	111	108	105	103	101	115	112	109	106	104
8500	136	132	122	119	127	123	120	117	114	111	109	106	104	118	115	112	110	107
8750	140	136	125	122	131	127	124	120	117	115	112	109	107	122	119	116	113	110
9000	144	140	129	126	134	131	127	124	121	118	115	112	110	125	122	119	116	113
9250	148	143	132	129	138	134	131	127	124	121	118	116	113	129	125	122	119	116
9500	152	147	136	133	142	138	134	131	128	124	121	119	116	132	129	126	122	119
9750	156	151	140	136	145	141	138	134	131	128	125	122	119	136	132	129	126	123
10000	160	155	143	140	149	145	141	138	134	131	128	125	122	139	136	132	129	126

Top Gear	24	24	23	23	23	23	23	23	23	23	22	22	22	22	22	22	22	22
Bottom Gear	42	43	37	38	39	40	41	42	43	46	37	38	39	40	41	42	43	46
7.92	76	NR	NR	74	74	NR	NR	76	76	NR	72	NR	74	74	NR	NR	76	NR
8.373	78	NR	NR	NR	76	NR	NR	78	NR	NR	NR	NR	76	76	NR	NR	78	NR
11.35	94	NR	NR	92	92	NR	NR	94	94	NR	NR	NR	92	92	NR	NR	94	NR
8.424	NR	NR	NR	NR	NR	NR	NR	NR	NR	80	NR	NR	NR	NR	NR	NR	NR	80
Gear Ratio	1.75	1.79	1.61	1.65	1.70	1.74	1.78	1.83	1.87	2.00	1.68	1.73	1.77	1.82	1.86	1.91	1.95	2.09
Jackshaft RPM	MPH																	
6000	74	72	80	78	76	74	72	71	69	64	77	75	73	71	69	68	66	62
6250	77	75	83	81	79	77	75	74	72	67	80	78	76	74	72	70	69	64
6500	80	78	87	84	82	80	78	76	75	70	83	81	79	77	75	73	71	67
6750	83	81	90	88	85	83	81	79	78	72	86	84	82	80	78	76	74	69
7000	86	84	93	91	89	86	84	82	80	75	89	87	85	83	81	79	77	72
7250	89	87	97	94	92	90	87	85	83	78	93	90	88	86	84	82	80	74
7500	92	90	100	97	95	93	90	88	86	81	96	93	91	89	86	84	82	77
7750	95	93	103	101	98	96	93	91	89	83	99	96	94	92	89	87	85	80
8000	98	96	107	104	101	99	96	94	92	86	102	99	97	95	92	90	88	82
8250	101	99	110	107	104	102	99	97	95	89	105	103	100	97	95	93	91	85
8500	104	102	113	110	108	105	102	100	98	91	109	106	103	100	98	96	93	87
8750	107	105	117	114	111	108	105	103	101	94	112	109	106	103	101	98	96	90
9000	110	108	120	117	114	111	108	106	103	97	115	112	109	106	104	101	99	92
9250	114	111	123	120	117	114	111	109	106	99	118	115	112	109	107	104	102	95
9500	117	114	127	123	120	117	114	112	109	102	121	118	115	112	109	107	104	98
9750	120	117	130	127	123	120	117	115	112	105	125	121	118	115	112	110	107	100
10000	123	120	134	130	127	123	120	118	115	107	128	124	121	118	115	113	110	103

Top Gear	21	21	21	21	21	21	21	21	21	21	20	20	20	20	20	20	20	20
Bottom Gear	37	38	39	40	41	42	43	44	46	47	37	38	39	40	41	42	43	45
7.92	72	NR	NR	74	74	NR	76	NR	NR	NR	72	72	NR	NR	74	74	NR	NR
8.373	NR	NR	NR	76	NR	NR	NR	78	NR	NR	NR	NR	NR	NR	76	NR	NR	78
11.35	90	NR	NR	92	92	NR	NR	NR	NR	NR	90	90	NR	NR	92	92	NR	NR
8.424	NR	NR	NR	NR	NR	NR	NR	NR	80	80	NR	NR	NR	NR	NR	NR	NR	NR
Gear Ratio	1.76	1.81	1.86	1.90	1.95	2.00	2.05	2.10	2.19	2.24	1.85	1.90	1.95	2.00	2.05	2.10	2.15	2.25
Jackshaft RPM	MPH																	
6000	73	71	69	68	66	64	63	62	59	58	70	68	66	64	63	61	60	57
6250	76	74	72	70	69	67	66	64	61	60	73	71	69	67	65	64	62	60
6500	79	77	75	73	72	70	68	67	64	62	75	73	72	70	68	66	65	62
6750	82	80	78	76	74	72	71	69	66	65	78	76	74	72	71	69	67	64
7000	85	83	81	79	77	75	73	72	69	67	81	79	77	75	73	72	70	67
7250	88	86	84	82	80	78	76	74	71	70	84	82	80	78	76	74	72	69
7500	91	89	87	85	83	81	79	77	74	72	87	85	83	81	79	77	75	72
7750	94	92	90	87	85	83	81	79	76	74	90	88	85	83	81	79	77	74
8000	98	95	93	90	88	86	84	82	78	77	93	90	88	86	84	82	80	76
8250	101	98	95	93	91	89	87	85	81	79	96	93	91	89	86	84	82	79
8500	104	101	98	96	94	91	89	87	83	82	99	96	94	91	89	87	85	81
8750	107	104	101	99	96	94	92	90	86	84	102	99	96	94	92	89	87	84
9000	110	107	104	101	99	97	94	92	88	86	104	102	99	97	94	92	90	86
9250	113	110	107	104	102	99	97	95	91	89	107	105	102	99	97	95	92	88
9500	116	113	110	107	105	102	100	97	93	91	110	107	105	102	100	97	95	91
9750	119	116	113	110	107	105	102	100	96	94	113	110	107	105	102	100	97	93
10000	122	119	116	113	110	107	105	103	98	96	116	113	110	107	105	102	100	95

Top Gear	19	19	19	19	19	19	19	19	18	18	18	18	18	18	18	17	17	17	17	17	17	17
Bottom Gear	37	38	39	40	41	42	43	46	37	38	39	40	41	42	43	37	38	39	40	41	42	43
7.92	NR	72	72	NR	74	74	74	NR	NR	NR	72	72	NR	74	74	70	NR	72	72	72	NR	74
8.373	NR	74	NR	NR	NR	76	NR	78	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
11.35	NR	90	90	NR	NR	92	92	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
8.424	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gear Ratio	1.95	2.00	2.05	2.11	2.16	2.21	2.26	2.42	2.06	2.11	2.17	2.22	2.28	2.33	2.39	2.18	2.24	2.29	2.35	2.41	2.47	2.53
Jackshaft RPM	MPH																					
6000	66	64	63	61	60	58	57	53	63	61	59	58	57	55	54	59	58	56	55	53	52	51
6250	69	67	65	64	62	61	59	55	65	64	62	60	59	58	56	62	60	59	57	56	54	53
6500	72	70	68	66	65	63	62	58	68	66	64	63	61	60	58	64	62	61	59	58	57	55
6750	74	72	71	69	67	66	64	60	71	69	67	65	64	62	61	67	65	63	62	60	59	57
7000	77	75	73	71	70	68	66	62	73	71	69	68	66	64	63	69	67	66	64	62	61	59
7250	80	78	76	74	72	70	69	64	76	74	72	70	68	67	65	72	70	68	66	65	63	62
7500	83	81	78	77	75	73	71	67	78	76	74	72	71	69	67	74	72	70	68	67	65	64
7750	85	83	81	79	77	75	74	69	81	79	77	75	73	71	70	76	74	73	71	69	67	66
8000	88	86	84	82	80	78	76	71	84	81	79	77	75	74	72	79	77	75	73	71	70	68
8250	91	89	86	84	82	80	78	73	86	84	82	80	78	76	74	81	79	77	75	73	72	70
8500	94	91	89	87	85	83	81	75	89	86	84	82	80	78	76	84	82	80	78	76	74	72
8750	97	94	92	89	87	85	83	78	91	89	87	85	83	81	79	86	84	82	80	78	76	74
9000	99	97	94	92	90	87	85	80	94	92	89	87	85	83	81	89	86	84	82	80	78	76
9250	102	99	97	94	92	90	88	82	97	94	92	89	87	85	83	91	89	87	84	82	80	79
9500	105	102	99	97	95	92	90	84	99	97	94	92	90	87	85	94	91	89	87	85	83	81
9750	108	105	102	99	97	95	93	86	102	99	97	94	92	90	88	96	94	91	89	87	85	83
10000	110	107	105	102	100	97	95	89	104	102	99	97	94	92	90	99	96	94	91	89	87	85

GEARS AND CHAINS

Gears

PART NUMBER	DESCRIPTION	CC FIT
3221093	17T, 3/4W, 15 SPL, HYVO, PM	7.92 8.37 11.35
3221094	18T, 3/4W, 15 SPL, HYVO, PM	
3221095	19T, 3/4W, 15 SPL, HYVO, PM	
3221096	20T, 3/4W, 15 SPL, HYVO, PM	
3221097	21T, 3/4W, 15 SPL, HYVO, PM	
3221098	22T, 3/4W, 15 SPL, HYVO, PM	
3221099	23T, 3/4W, 15 SPL, HYVO, PM	
3221101	24T, 3/4W, 15 SPL, HYVO, PM	
3221102	25T, 3/4W, 15 SPL, HYVO, PM	
3222127	26T, 3/4W, 15 SPL, HYVO, PM	
3222126	36T, 3/4W, 15 SPL, HYVO, PM	7.92 8.37 11.35
2900010	37T, 3/4W, 15 SPL, HYVO, CM	
3222125	37T, 3/4W, 15 SPL, HYVO PM	
2900011	38T, 3/4W, 15 SPL, HYVO, CM	
3222108	39T, 3/4W, 15 SPL, HYVO, PM	
3222099	40T, 3/4W, 15 SPL, HYVO, PM	
3222101	41T, 3/4W, 15 SPL, HYVO, PM	
2900005	42T, 3/4W, 15 SPL, HYVO, CM	
2900016	43T, 3/4W, 15 SPL, HYVO, CM	
3221188	43T, 3/4W, 15 SPL, HYVO, PM	
1341243	39T, REVERSE, 3/4W, 15 SPL, HYVO, PM	7.92
1341227	40T, REVERSE, 3/4W, 15 SPL, HYVO, PM	
1341228	41T, REVERSE, 3/4W, 15 SPL, HYVO, PM	
3221164	18T, 7/8W, 15 SPL, HYVO, CM	7.92 8.37 11.35
3221165	19T, 7/8W, 15 SPL, HYVO, CM	
3221166	20T, 7/8W, 15 SPL, HYVO, CM	
3221167	21T, 7/8W, 15 SPL, HYVO, CM	
3221168	22T, 7/8W, 15 SPL, HYVO, CM	
3221169	23T, 7/8W, 15 SPL, HYVO, CM	
3221170	24T, 7/8W, 15 SPL, HYVO, CM	
3221171	25T, 7/8W, 15 SPL, HYVO, CM	

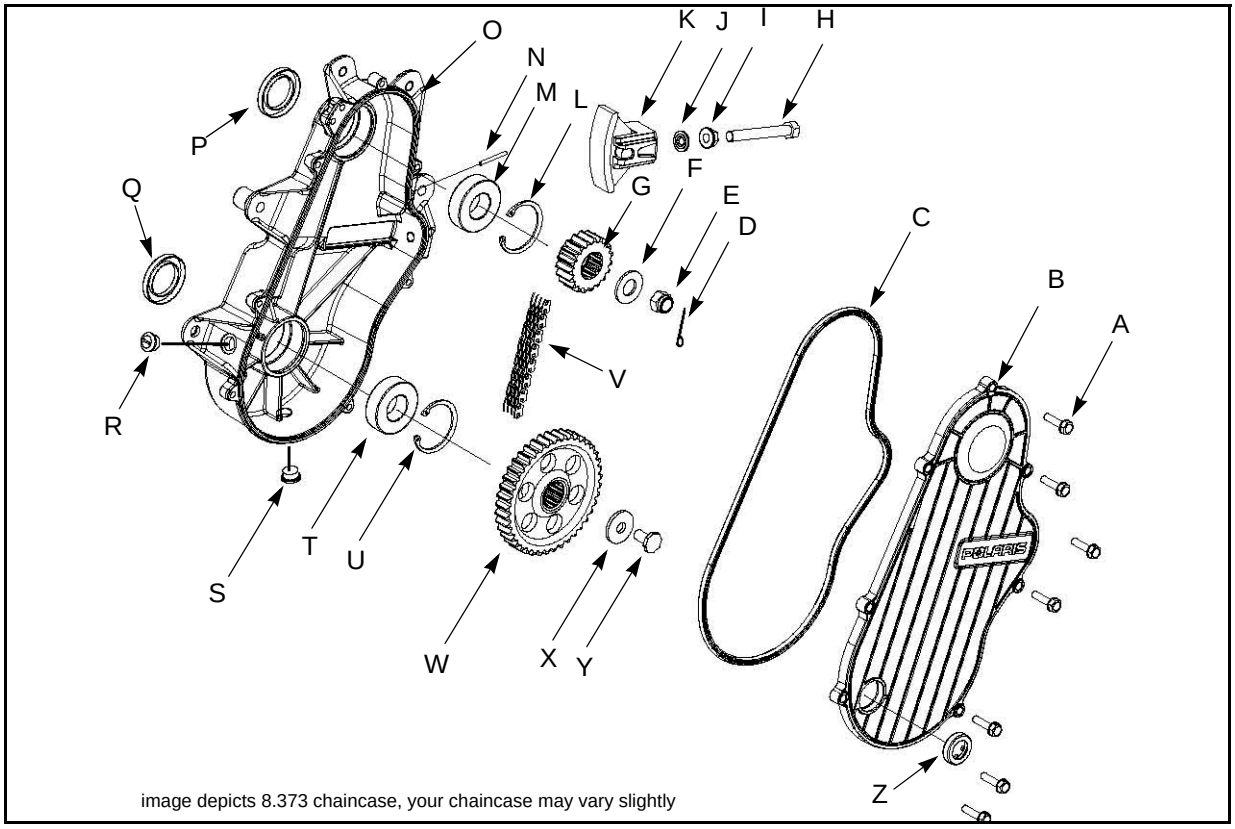
CM = Cut Metal Sprocket **PM** = Powder Metal Sprocket **CD** = Center Distance between top and bottom sprocket.

Drive Chain

PART NUMBER	DESCRIPTION	CHAINCASE FIT
3221114	64P, 3/4W, HYVO CHAIN	7.92 8.37 11.35
3221113	66P, 3/4W, HYVO CHAIN	
3221112	68P, 3/4W, HYVO CHAIN	
3221115	70P, 3/4W, HYVO CHAIN	
3221110	72P, 3/4W, HYVO CHAIN	
3221109	74P, 3/4W, HYVO CHAIN	
3221108	76P, 3/4W, HYVO CHAIN	
3221158	90P, 3/4W, HYVO CHAIN	11.35
3221157	92P, 3/4W, HYVO CHAIN	
3221156	94P, 3/4W, HYVO CHAIN	
3221161	96P, 3/4W, HYVO CHAIN	
3222131	74P, 7/8W, HYVO CHAIN	7.92 8.37 11.35
3222132	76P, 7/8W, HYVO CHAIN	
3222110	78P,3/4W,HYVO CHAIN	

CHAIN CASE

Exploded View



Chaincase

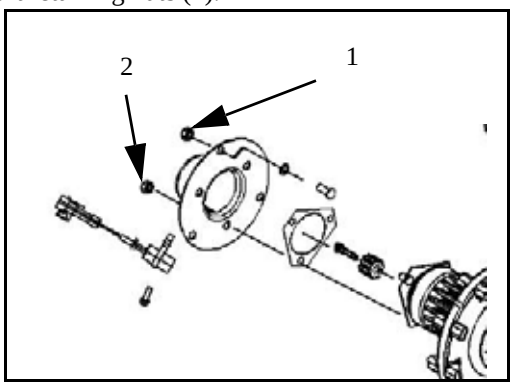
ITEM	DESCRIPTION	TORQUE SPECIFICATION / NOTES	ITEM	DESCRIPTION	TORQUE SPECIFICATION / NOTES
A	Cover bolts	8 ft-lb(11N-m)	N	Breather roll pin	
B	Chaincase cover		O	Chaincase	
C	Cover gasket	make sure that the gasket is not pinched during assembly	P	Upper seal	Install so that the lip is facing the chaincase
D	Cotter pin	bend the ends over the nut flats when installing	Q	Lower seal	Install so that the lip is facing the chaincase
E	Jackshaft nut	50 ft-lb (62.5N-m)	R	Fill plug	
F	Washer		S	Drain plug	8 ft-lb (11N-m)
G	Top sprocket	Install so that the shoulder is facing the bearing	T	Lower bearing	Loctite 680 when assembled
H	Chain tensioner adjuster	Torque only finger tight during assembly	U	Lower c-clip	Install so that the chamfered edge is facing the bearing
I	Tensioner lock nut		V	Chain	
J	Fastener Seal	Thread this onto the adjuster bolt during assembly	W	Lower sprocket	Install so that the shoulder is facing the bearing
K	Tensioner Assembly		X	Washer	
L	Upper c-clip	Install so that the chamfered edge is facing the bearing	Y	Lower sprocket retaining bolt	19 ft-lb (26N-m)
M	Upper bearing	Loctite 680 when assembled	Z	Sight glass	Only remove if replacing

Chaincase Removal

1. Support the rear of the machine and loosen up the track tension.
2. Remove RH side panel.
3. Remove the exhaust system.
4. Remove the plenum.
5. Remove drain plug and drain the chaincase fluid.
6. Once fluid is drained replace drain plug and torque to 8 ft-lb (11 N-m).

= T
Drain Plug: 8 ft.lb (11 N-m)

7. Remove the speedo drive nuts (1) to gain access to the drive shaft retaining nuts (2).



8. Remove driveshaft retaining nuts.
9. Remove the Torx™ screw that holds on the cowling on the LH side.
10. Remove the Torx™ screws that hold the oil/coolant bottles to the bracket. This will give you room to remove the caliper later.
11. Move the RH cowling away from the footrest and remove the RH storage compartment by prying the top and sides of the compartment in to clear the foot rest. This will give you room to access the chaincase retaining bolts.
12. Apply the parking brake.
13. Tip machine over on its LH side.
14. Remove the chaincase cover and clean it.
15. Remove the lower sprocket bolt and washer (X,Y).
16. Remove the cotter pin (D) on the jackshaft.
17. Remove the jam nut (E) and washer (F) on the jackshaft (upper sprocket).
18. Release the parking brake.
19. Release the tension on the chaincase tensioner (H).
20. Remove the sprockets (G,W) and chain (V) from the chaincase.
21. Remove the brake caliper bolts.
22. Push the coolant hose enough to remove the caliper out of the way of the chaincase.
23. Remove the rear suspension.
24. Carefully slide the driveshaft down so that it clears the chaincase, and remove the driveshaft.
25. Remove the track from the chassis.
26. Remove the chaincase retaining bolts.
27. Slide the chaincase out of the chassis.
28. Inspect the o-ring and seal sleeve on the jackshaft and replace the o-ring.
29. Service the chaincase.

Chaincase Installation

1. Install the seal sleeve and o-ring onto jackshaft. The seal sleeve goes on first then the o-ring.
2. Install jackshaft installation tool PN 2871296 onto the jackshaft.This will prevent damage to the seal.
3. Install assembled chaincase onto the jackshaft in chassis.
4. Insert carriage bolts through the back side of the chassis and install the nylock nuts loosely.
5. Insert the track.
6. Insert the driveshaft and careful guide it through the lower bearing of the chain case.
7. Loosely install the lower sprocket on the drive shaft with the retaining bolt. This will keep the driveshaft from falling through the other side.
8. Install the rear suspension.
9. Tip machine over so that it is upright.
10. Support the rear of the machine with a jack stand.
11. Center the track so that it is contacting the drive shaft drivers correctly.
12. Remove the jackshaft installation tool from he jackshaft.
13. Install the jackshaft alignment tool on jackshaft and torque enough so that the jackshaft is aligned with the chaincase bearing.
14. Torque all chaincase retaining bolts to 28-30 ft-lb (38-41N-m).

= T
Chaincase Bolts: 28-30ft-lb (38-41 N-m)

15. Remove the jackshaft alignment tool from jackshaft.
16. Install brake caliper and torque the retaining bolts to 19-21 ft-lb.(26-28 N-m).

= T
Brake Caliper Bolts: 19-21 ft-lb (26-28 N-m)

17. Install the driveshaft by replacing the flangette nuts on the speedo drive side. torque to 19-21 ft-lb (26-28 N-m).

= T
Speedo Drive Flangette Nuts: 19-21 ft-lb (26-28N-m)

18. Replace the speedo drive cover.
19. Torque the speedo drive cover nuts to 11 ft-lb (1 5N-m).

= T
Speedo Drive Cover Nuts: 11ft-lb (1 5N-m)

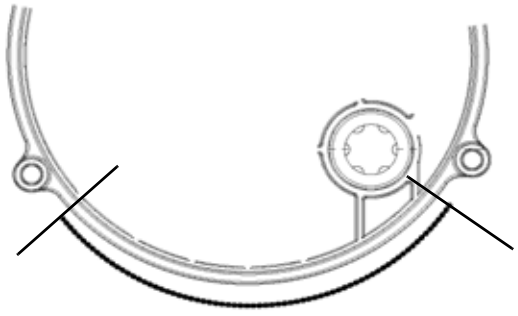
20. Remove the loosely placed lower gear and retaining bolt.
21. Place the upper sprocket, lower sprocket into the chain, and install it onto the shafts in the chaincase.
22. Lock the parking brake.
23. Replace the top sprocket retaining nut. Torque to 50 ft-lb.

= T
Top Sprocket Nut: 50 ft.lb. (6 8N-m)

24. Install cotter pin and bent the ends around the jackshaft end.
25. Install the lower sprocket retaining bolt. Torque to 19-21 ft-lb.(26-28 N-m).

= T
Bottom Sprocket Bolt: 19-21 ft.lb. (26-28 N-m)

26. Release the parking brake.
27. Adjust the chain tensioner by hand and back off 1/4 turn.
28. Lock the adjuster lock nut.
29. Apply silicone at or between the two lower bolts over the gasket.



Apply 1/8” bead of silicone to the cover over the existing gasket

30. Install the chaincase cover, and torque the cover bolts to 10 ft-lb (13.5 N-m).

= T
Chaincase Cover Bolts: 10 ft.lb. (13.5 N-m)

31. Remove the fill cover and fill chaincase to the appropriate level.
32. Check for leaks.
33. Adjust track tension to the specified tension.
34. Install the LH storage compartment into the LH footwell area.
35. Insert the lower tabs on the cowling in the LH footwell.
36. Replace the Torx™ screw that holds the cowling onto the steering hoop.

Chaincase Seal & Bearing Replacement

1. Remove the chaincase as described above.
2. Pry out the old seals (P,Q) from the back side of the chaincase.
3. Remove bearing retaining snap rings (L,U).
4. Press out the old bearings (M,T) from the back side of the chain case so that the bearings drop out of the front. If the bearing pushes out hard, warm the area to expand the chaincase bore slightly.

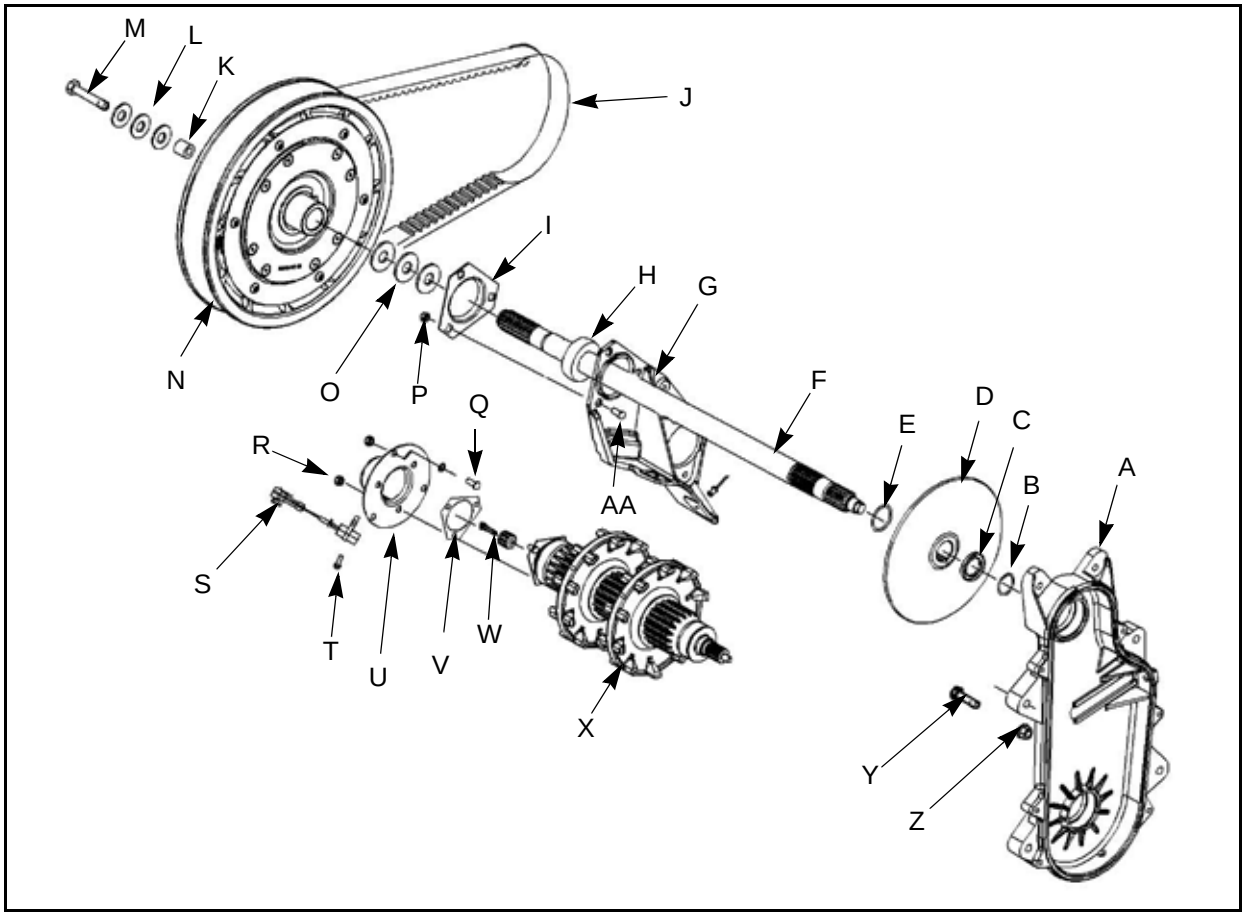
NOTE: ***When removing always push out the bearing towards the snap ring side of the chaincase.***

5. Clean the chaincase.
6. Apply Loctite® 680 to the outer race of the new bearings and press them into the chaincase from the snap ring side.

NOTE: ***Press on the bearing outer race only, or damage may occur to bearing.***

7. Replace the snap rings (L,U).
8. Press in new seals (P,Q) in the back of the chaincase until the outer edge of the seal is flush with the chaincase shoulder.

DRIVE TRAIN



Jackshaft Exploded View

ITEM	DESCRIPTION	TORQUE SPECIFICATION / NOTES	ITEM	DESCRIPTION	TORQUE SPECIFICATION / NOTES
A	Chaincase	7.92, 8.37, 8.47	N	Driven Clutch	
B	O-ring	8.37 chaincase - install seal sleeve (C) first, then o-ring (B) on jackshaft 7.92 chaincase - install seal sleeve (C) first, then o-ring (B) on jackshaft	O	Washers	Note the placement
C	Seal		P	Flangette Nuts	11 ft-lb (15 N-m)
D	Brake Disk	Minimum thickness = .193" (4.9mm)	Q	Driveshaft Flangette Carriage Bolts	
E	Retaining Ring	included on jackshaft	R	Nylock Nut	11 ft-lb (15 N-m)
F	Jackshaft		S	Speedo Pick Up (Speed Sensor)	
G	Bulkhead area		T	Speed Sensor Bolt	5 ft-lb (7 N-m)
H	Bearing		U	Speedo Pick Up Housing	
I	Flangette		V	Speedo Pick Up Gasket	
J	Belt		W	Speedo Wheel Pick Up and bolt	12-15 ft-lb (8.8-11 N-m)
K	Spacer		X	Drive Shaft	7.92 chaincase - install o-ring (B) first then seal sleeve (C) on driveshaft.
L	Washers		Y	Chaincase Carriage Bolt	
M	Driven clutch retaining bolt	17 ft-lb (23 N-m)	Z	Nylock Nut	20 ft-lb (27 N-m)

Jackshaft Removal

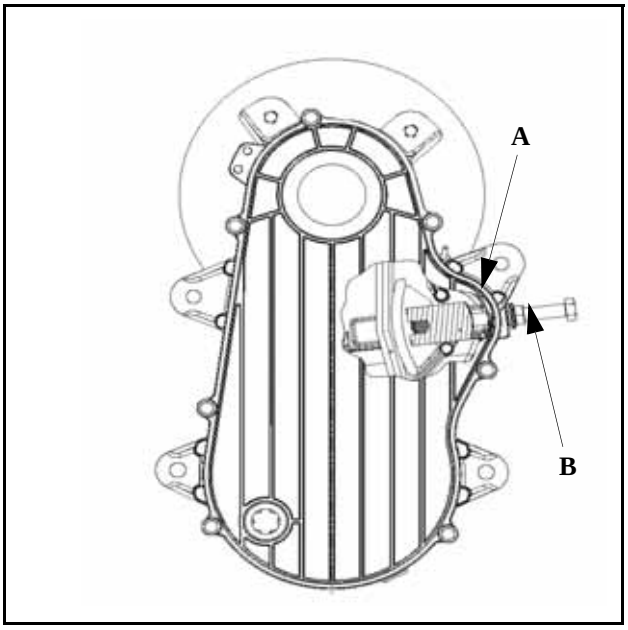
1. Remove the drive belt (J).
2. Remove the driven clutch (N) and make note of the placement of the washers (O).
3. Drain the chaincase fluid.
4. Remove the chaincase cover.
5. Remove the cotter pin on the upper sprocket.
6. Apply parking brake.
7. Remove the upper sprocket nut.
8. Remove the lower sprocket retaining bolt.
9. Loosen the chain tensioner.
10. Remove the upper and lower sprockets and chain from chaincase.
11. Release the parking brake.
12. Remove the bearing flange on the driven clutch side (I).
13. Remove the jackshaft assembly (E,F,H) from the brake disc (D) and chassis by tapping on the end of the jackshaft (F) with a soft face hammer.
14. This will also remove the o-ring (B) and seal (C).
15. Inspect jackshaft in bearing contact area. If diameter is 0.001" (.025 mm) less than non-contact area, replace the jackshaft.

Jackshaft Installation

1. Install jackshaft installation tool PN 2871296 onto the threads of the jackshaft.
2. Insert the new jackshaft assembly through the brake disk and install a new seal (C) and o-ring (B).
3. Remove the jackshaft installation tool.
4. With the jackshaft through the chaincase, install the jackshaft alignment tool PN 2871535 and secure with the flat washer and castle nut.
5. Tighten the castle nut securely to ensure positive bearing and jackshaft seating to chaincase.
6. If shaft is not centered, tap shaft with a soft faced hammer until centered. This will align the upper chaincase bearing in the chaincase bore.
7. Once the correct jackshaft alignment has been achieved, install lock nuts on the chaincase mounting bolts and torque them to 20 ft-lb (27 N-m).
8. Remove the jackshaft alignment tool from chaincase.
9. Install jackshaft flangette (I) and bolts (AA). Align grease hole in bearing with hole or fitting in flangette. Torque nuts to 11 ft-lb (15 N-m).
10. Place the same amount of washers (O) on the drive clutch end of the jackshaft.
11. Install the driven clutch, spacer (K), and washers (L) and torque the retaining bolt (M) to 17 ft-lb (23 N-m).
12. Install the belt.
13. Check clutch alignment. See “Clutch Alignment / Offset” on page 6.14.

ADJUSTMENTS

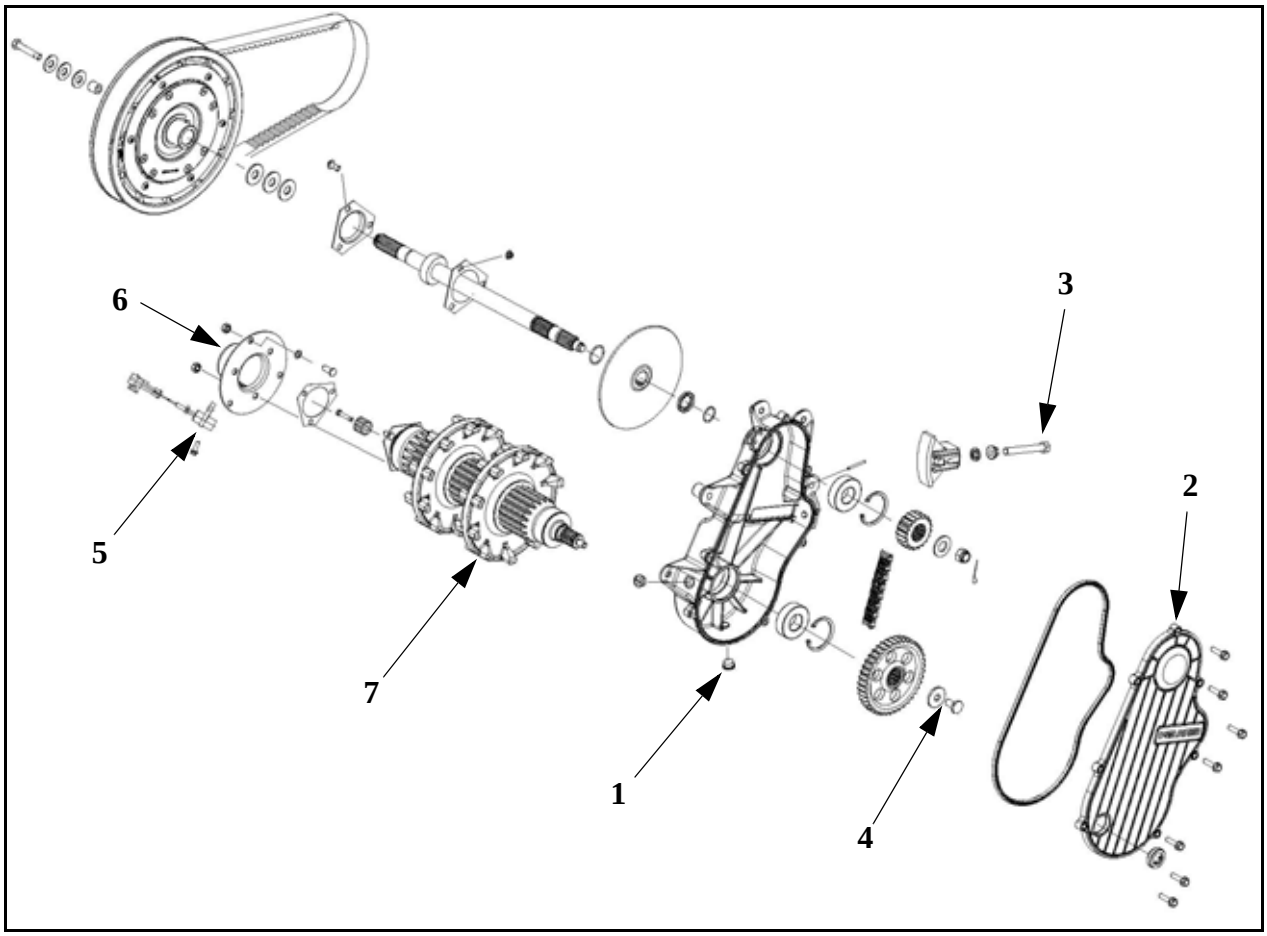
Chaincase Drive Tension



NOTE: It may be necessary to remove the exhaust pipe and resonator to access this area.

1. Elevate the rear of the machine so that the track is off the floor.
2. Rotate the driven clutch counterclockwise to move all the chain slack to the tensioner side.
3. Lock the parking brake.
4. Loosen the adjuster bolt jam nut (A).
5. Finger tighten the adjuster bolt (B).
6. Back off the adjuster bolt 1/4 turn out (counterclockwise)
7. Tighten the jam nut while holding the adjuster bolt.
8. Release the parking brake.

DRIVESHAFT



Driveshaft Removal/Installation

1. Remove the side panels.
2. Remove the intake plenum.
3. Remove the drain plug (1) and drain the chaincase fluid.
4. Replace the chaincase drain plug and torque it to 8 ft-lb (11 N-m).

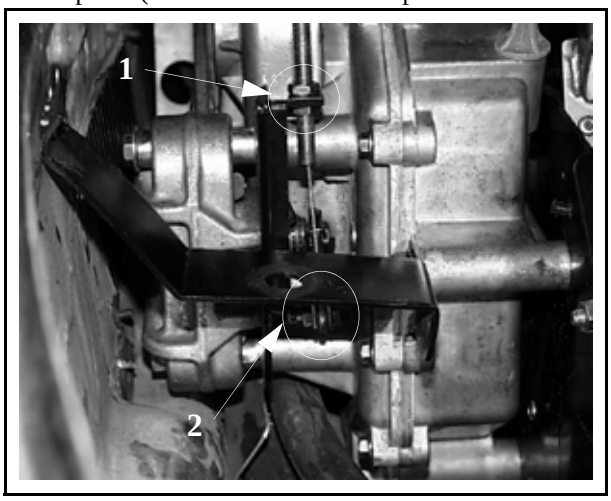
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Drain Plug: 8 ft-lb (11 N-m)

5. Remove the chaincase cover (2).
6. Loosen the tensioner (3).
7. Remove the lower sprocket bolt and washer (4).
8. Shut off the fuel valve if so equipped.
9. Remove the exhaust system.
10. Remove the speedo drive pickup (5).
11. Remove the speedo drive housing (6).
12. Remove the rear skid.
13. With the sled over on its left side and the rear skid removed, remove the drive shaft (7).
14. Assemble in reverse order

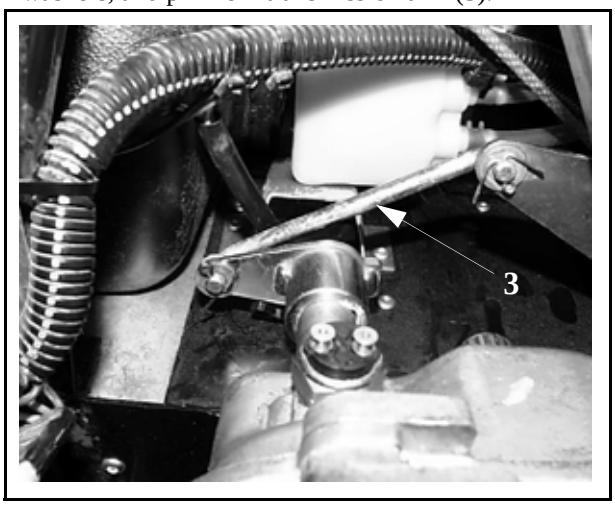
WIDETRAK TRANSMISSION

Removal

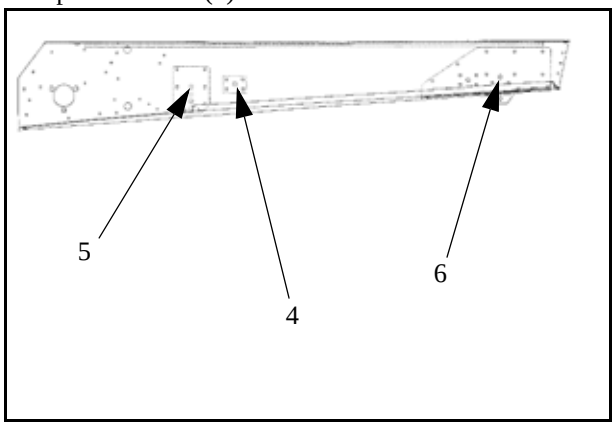
1. Hood can be removed to prevent damage. Mark hood hinges for ease of alignment when reassembling unit.
2. Remove battery.
3. Turn off fuel valve. Move oil tank for access.
4. Remove air intake and coolant recovery bottle from its mounting.(do not remove entirely).
5. Remove drive belt.
6. Remove driven clutch retaining bolt assembly and drive clutch. Note number of spacers which are behind driven clutch for installation during reassembly procedures.
7. Remove muffler springs and muffler from unit.
8. Loosen brake cable jam nut (1) and remove cable bolt, nut and spacer (2. Use care not to lose spacer.



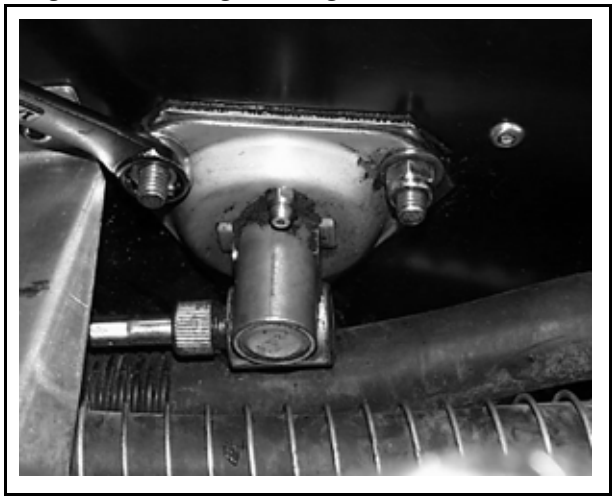
9. Remove cable from transmission.
10. Note location of shift linkage on transmission to assure proper location during reassembly. Remove cotter pin, washers, and pin from transmission arm (3).



11. Remove brake light wire connector from sensor.
12. Loosen rear idler wheels and bolts.
13. Loosen jam nuts on adjustment bolts on both sides. Back out adjustment bolts to allow rear idler assembly to come forward, relieving track tension.
14. Tighten idler wheel bolts so that spacers on shafts do not rotate and lose alignment.
15. Remove carrier shaft bolts (4), and front (5) and rear suspension bolts (6) from both sides.



16. Place a protective mat on the floor. Tip unit onto right side and remove suspension.
17. Remove the bolts, nuts, and flangette supporting jackshaft bearing. Loosen and slide back lock ring from transmission end of jackshaft.
18. Remove jackshaft by pulling towards driven clutch side and lifting upward through bulkhead. It may be necessary to lightly tap on bearing collar to free coupler of jackshaft from transmission end.
19. Inspect bearing. If loose on the shaft the shaft must be replaced. If bearing is rough when turned, the bearing must be replaced. The bearing is pressed onto the shaft and will require a puller for removal.
20. Loosen and remove three carriage bolts and nuts retaining angle drive housing and flangette.



21. Remove angle drive housing, adaptor key, flangette, gasket, and bearing from drive shaft and tunnel.

NOTE: It is not necessary to remove speedometer cable from angle drive. Replace adaptor key any time drive train assembly is serviced.

22. Tip machine back onto floor.
23. Remove bolt retaining rear of bumper to foot rest.
24. Bend muffler mount out of the way to allow transmission removal.
25. Remove three transmission retaining bolts. Note all alignment shim quantities and locations for reassembly.

NOTE: Retaining bolts have to be held in place from underside while removing nuts. The lower front bolt cannot be removed at this time. It must be lowered to the drive sprocket.

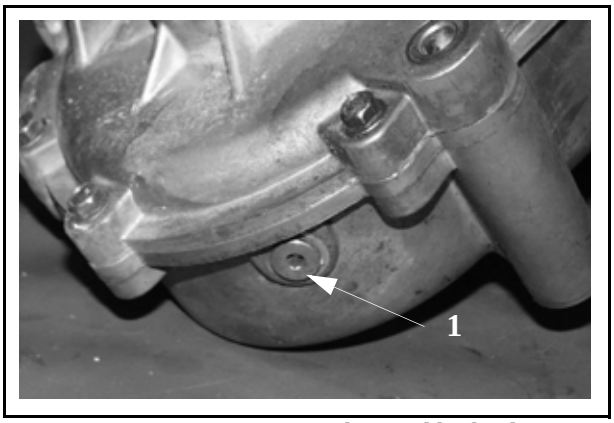
26. Lift and maneuver transmission to free drive shaft coupler.
27. Lower drive shaft and remove lower front bolt.
28. Maneuver transmission until it can be removed from the unit. Use care not to damage coolant lines.
29. With transmission removed, tip unit onto right side. Notice direction of track rotation for reassembly. The arrow in the photo at right indicates track bottom, rear of unit.
30. Remove front and rear carrier shafts.
31. Remove suspension by pulling rear of track out of tunnel. Slide suspension forward to driveshaft. Lift up and out at the rear.

NOTE: NOTE: On some models it may be necessary to unhook rear torque arm springs to allow torque arm to lower.

32. Inspect transmission, brakes, suspension and track for excessive wear. Check bearings for excessive movement or rough feeling. Replace if necessary.

Inspection

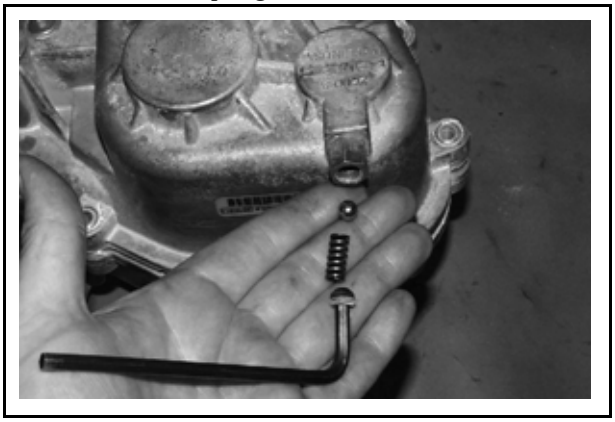
1. Remove drain plug (1) and drain transmission oil into suitable container.



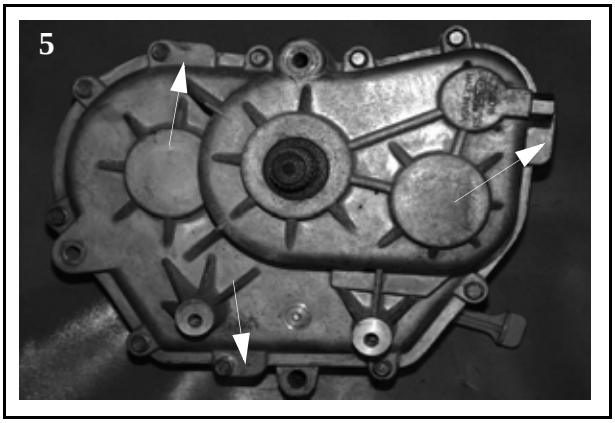
2. Remove snap ring, spacer washer, and brake disc.

NOTE: Note position of spacer washers behind disc for proper alignment upon reassembly.

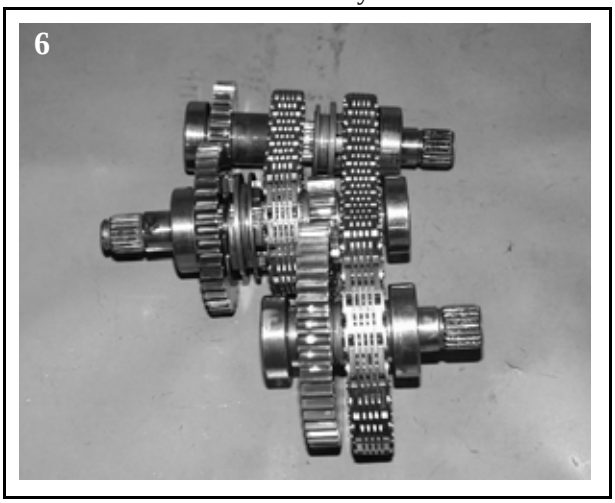
3. Remove detente spring and ball.



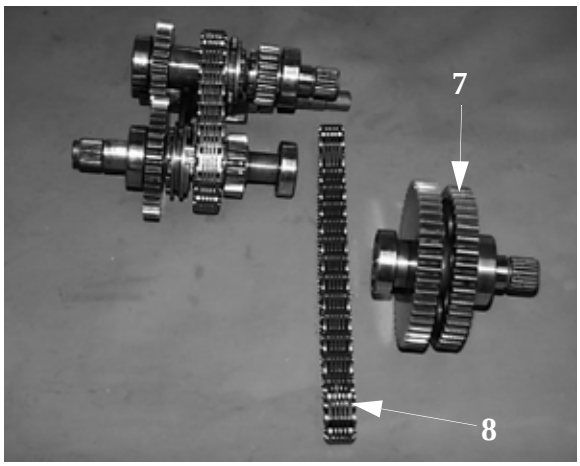
4. Remove case bolts evenly in a criss-cross pattern.
5. Tap cases apart with soft faced hammer in the reinforced areas (2). Tap end of brake shaft to be sure it remains in case.



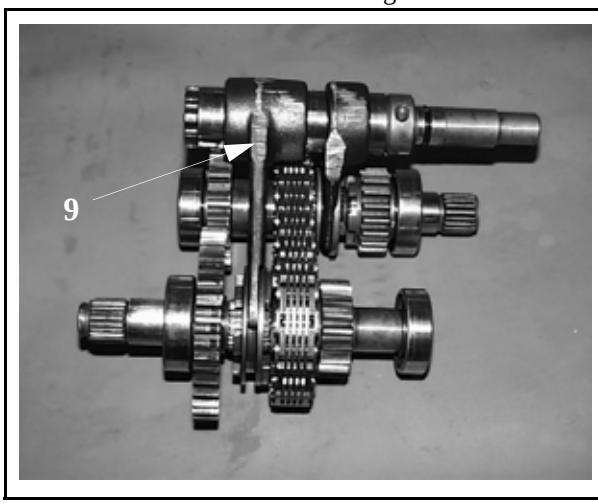
6. Remove shift arm.
7. Remove shaft and gear assembly (6) from case by tapping with a soft faced hammer evenly on end of shafts.



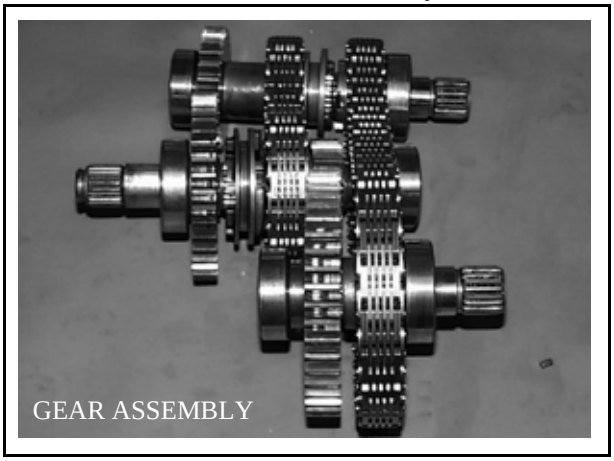
8. Remove output gear assembly (7) and chain (8). Mark chain direction for reference during reassembly. Inspect gear teeth for damage. Inspect chain for worn, cracked, or broken link plates.



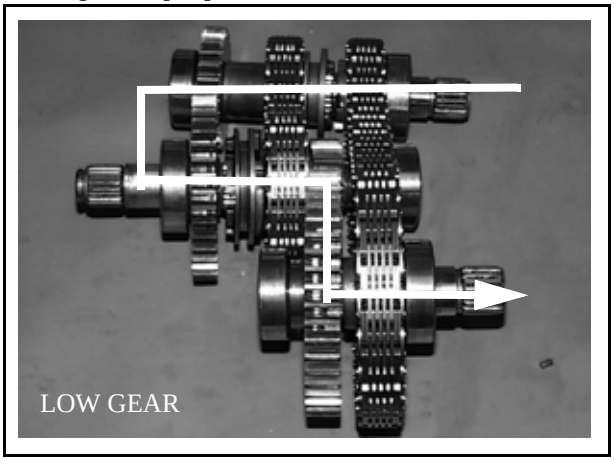
9. Remove shift fork shaft (9) from gear cluster. Inspect surface of fork for wear or bending.



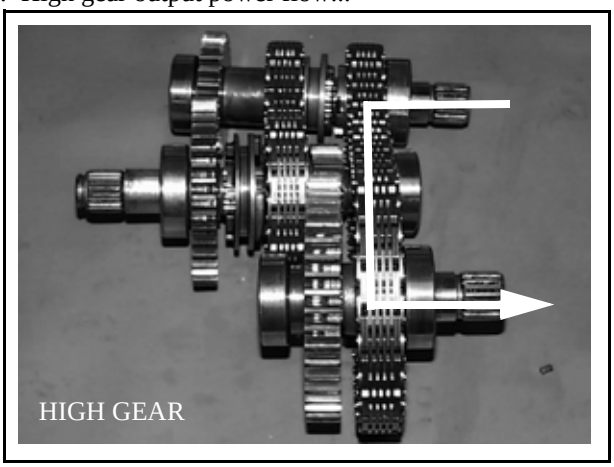
10. Remove chain from input and reverse shaft. Inspect gear teeth for damage. Inspect chain for worn, cracked, or broken link plates.
11. Inspect dog gears and slots in mating gears closely. Rounded edges will cause gears to disengage under load. Replace both dog gear and mating gear if edge of dog and/or slot is rounded. Inspect gears for chipped, cracked, or broken teeth.
12. Gear, shaft, and chain cluster assembly shown.



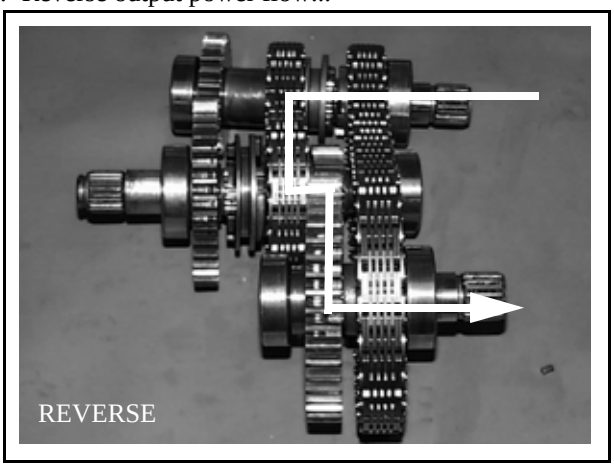
13. Low gear output power flow...



14. High gear output power flow...

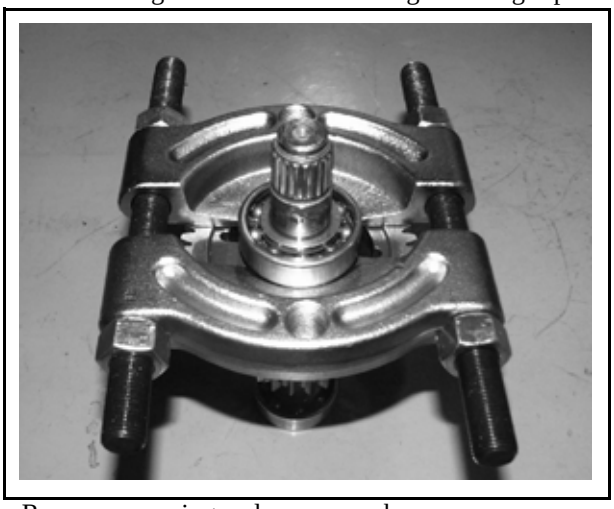


15. Reverse output power flow...

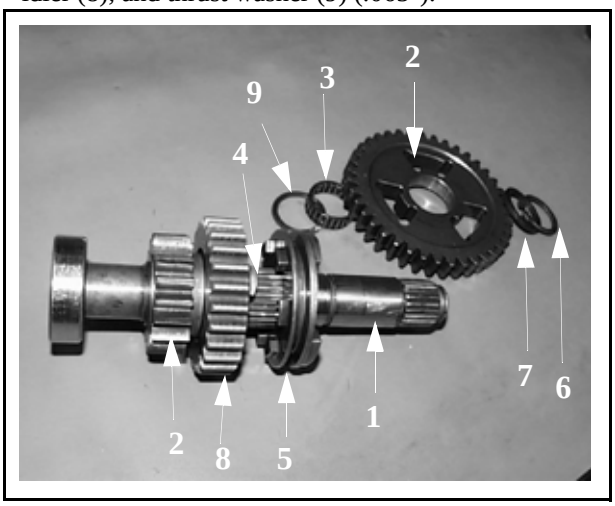


Low/Reverse Shaft Disassembly

1. Press bearing from end of shaft using a bearing separator.



2. Remove snap ring and spacer washer.
3. Remove low reverse shaft (1), low gear (2), needle bearing (3), thrust washer (4), low/reverse dog gear (5).
4. Remove Snap ring (6), thrust washer (7) (.125"), reverse idler (8), and thrust washer (9) (.065").

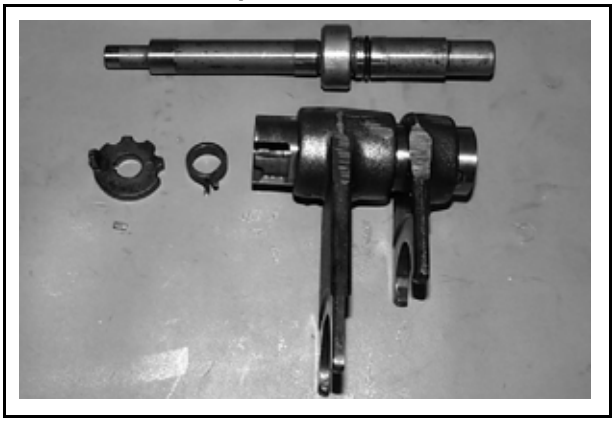


5. Closely inspect drive dogs. Replace gear and mating gear if rounded, chipped or broken.
6. Inspect needle bearings for wear or cracks on cage. Shiny spots on cage indicate wear and the bearing should be replaced. Inspect shaft and thrust washers for galling or wear. Always replace snap rings if removed.

Shift Fork Disassembly

1. Remove the detente cam, spring and shaft.
2. Check condition of key way and key. Inspect indicator, spring legs and detente areas for wear. Replace parts as required.

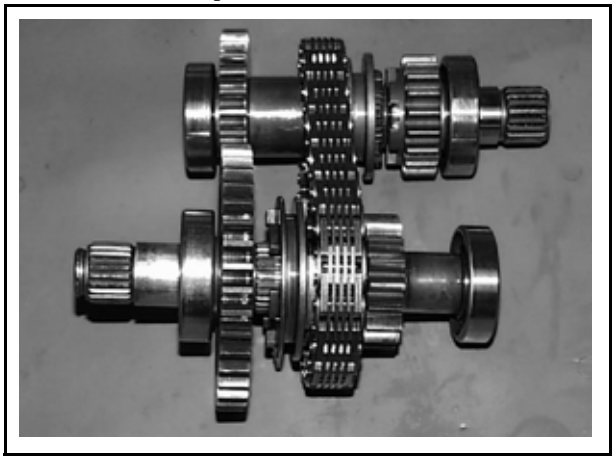
NOTE: The spring must be pre-loaded upon installation. Refer to photo and illustration below.



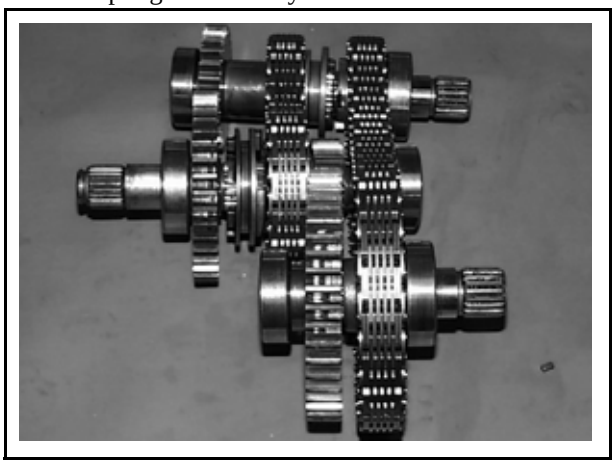
Transmission Assembly

Lubricate all parts before assembly with Premium Synthetic Chaincase Lubricant.

1. Install chain on input and reverse shaft.



2. Add output gear assembly with chain.



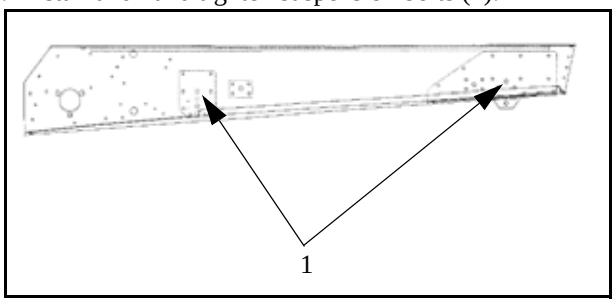
3. Add shift fork assembly.
4. Install entire assembly in case half.
5. Apply 3 Bond™ 1215 Sealant to case halves.
6. Install outer case half and replace brake cable bracket. Torque bolts in three steps to 8-10 ft. lbs. (11-14 N-m) using a criss-cross pattern. Remove dowel from tensioner and install access plug (where applicable).
7. Install seals, shift arm, brake disc and caliper. Install detente ball, spring, and spring guide. Fill with 20 ounces (600cc) Polaris Premium Synthetic 0W-40 Oil.

Transmission Installation

1. Tip unit onto right side.
2. Insert track in unit, making sure direction of rotation is correct.
3. Place drive shaft in unit, aligning drive sprockets and track drive lugs.
4. Install lock collar, flangette, bearing, gasket, and flangette on drive shaft, positioning bearing flush with end of drive shaft.
5. Lightly tighten set screws to hold bearing in place.
6. Align flangette holes with tunnel.
7. Replace adaptor key in drive shaft. Install angle drive housing aligning adaptor key with angle drive.
8. Install nuts and finger tighten.
9. Tip machine onto its left side.
10. Replace O-rings on input and output shafts. Apply Polaris All Season Grease to drive shaft coupler splines.
11. Reinstall transmission, using care not to damage coolant hoses. Be sure transmission shift linkage is properly located.
12. Install lower front mounting bolt (3) before coupling to shaft. Once bolt is started into transmission housing, align coupling with drive shaft and jack shaft splines. Keep transmission flat and lower gradually to prevent binding of couplers.
13. Install remaining transmission mounting bolts. Reinstall shim washers in original positions and tighten bolts securely.

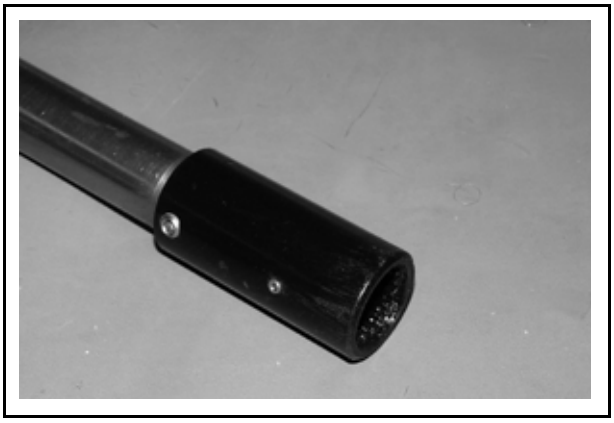
NOTE: Proper transmission/jackshaft alignment is critical for bearing service life. Use a standard nut and flat washer for initial installation of transmission, and install new mounting hardware after jackshaft alignment is complete.

14. Tip machine onto its right side.
15. Loosen set screws and seat drive shaft in transmission coupler stub shaft. For ease of assembly, make sure track has no pressure against drive shaft.
16. Tighten nuts retaining angle drive housing to tunnel. Torque to specification.
17. Reinstall suspension inside track and align with tunnel mounting holes.
18. Install and hand tighten suspension bolts (1).



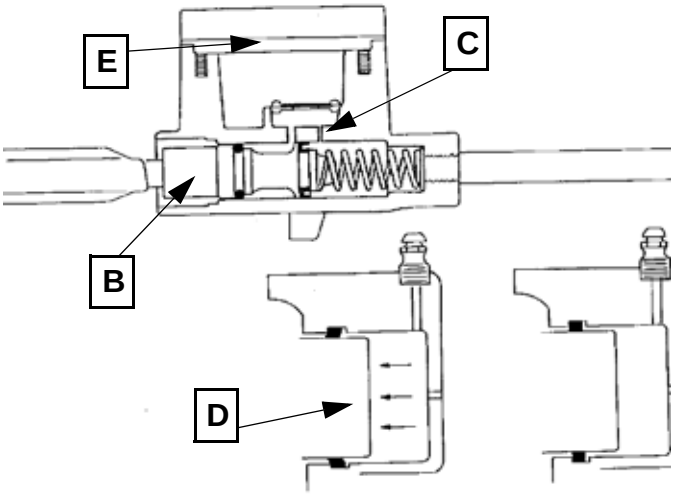
19. Install front carrier shaft assembly inside track and mount to tunnel with bolts. Hand tighten bolts.
20. Install rear carrier shaft assembly. Make sure bolts are not cross threaded and hand tighten.
21. Tip machine back onto floor and tighten all suspension bolts to specification.

22. If jackshaft was removed from unit, grease coupler spline with Polaris Premium All Season Grease and install on transmission.



23. Reattach transmission shift linkage and brake light connector. Check transmission fluid level and fill if necessary
24. Attach brake cable to transmission mounting with bolt, nut and spacer.
25. Install bumper onto footrest bolt and tighten.
26. Reinstall bumper plug.
27. Reinstall and secure muffler.
28. Install battery, air box, oil tank, and coolant recovery bottle.
29. Loosen rear idler bolts.
30. Reinstall driven clutch and spacers onto jackshaft and tighten.
31. Reinstall clutch offset washers on jackshaft and install driven clutch. Using the clutch alignment tool adjust driven clutch to achieve proper offset.
32. Widetrak models have no float on driven clutches. Use shim washers (PN 7555734) to create gap between shaft and cover washer only.
33. Torque driven clutch retaining bolt to specification.
34. Lift and support rear of unit and align track to specifications found in the Maintenance section. Make sure rear idler wheel spacer location is correct before tightening idler wheels.

HYDRAULIC BRAKE SYSTEM



Overview

The Polaris snowmobile hydraulic brake system consists of the following components or assemblies: brake lever, master cylinder, hydraulic hose, brake caliper (slave cylinder), brake pads, and a brake disc which is secured to the drive line.

When the hand activated brake lever (A) is applied, it contacts a piston (B) within the master cylinder. As the master cylinder piston moves inward it closes a small opening called a compensating port (C) within the cylinder and starts to build pressure within the brake system. As the pressure within the system is increased, the pistons (D) located in the brake caliper move toward the disc and applies pressure to the moveable brake pads. As the lever pressure is increased, the braking effect is increased.

The friction applied to the brake pads will cause the pads to wear. As the pads wear, the piston within the caliper self-adjusts and moves further outward.

Brake fluid level is critical to proper system operation. A low fluid level allows air to enter the system causing the brakes to feel spongy.

Compensating Port

Located within the master cylinder is a small compensating port (C) which is opened and closed by the master cylinder piston assembly. The port is open when the brake lever is released and the piston is outward. As the temperature within the hydraulic system changes, this port compensates for fluid expansion caused by heat, or contraction caused by cooling. 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 have adequate space to allow for the brake fluid to expand. Master cylinder reservoirs should be filled to the top of the fluid level mark on the inside of the reservoir, 1/4" - 5/16" (.6 -.8 cm) below lip of reservoir opening.

This system also incorporates a diaphragm (E) as part of the cover gasket and a vent port (on cover) 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. Be sure the vent is open and allowed to function. If the reservoir is overfilled or the diaphragm vent is plugged, the expanding fluid may build pressure in the brake system and lead to brake failure.

General Guidelines

⚠ WARNING

Contaminated brake discs or brake pads greatly reduce braking performance and increase stopping distance. Do not attempt to clean contaminated pads. Replace them. Clean the brake disc with brake cleaner.

This brake system requires ethylene-glycol based fluid (DOT 4). Do not use or mix different types of fluid such as silicone-based or petroleum-based.

Do not use brake fluid taken from old, used or unsealed containers. Never reuse brake fluid.

Keep brake fluid tightly sealed and out of reach of children. Brake fluid can accumulate moisture, reducing it's effectiveness.

A soft, spongy feeling in the brake lever and/or brake pedal could indicate a hazardous condition in the brake system. Do not operate the motorcycle until the failure in the brake system is corrected.

An unsafe condition exists when air is trapped in the hydraulic brake system. Air in the brake hydraulic system acts like a soft spring and absorbs a large percentage of the pressure developed by the master cylinder. Without this pressure, the braking system cannot develop full braking force to allow for safe, controlled stops. It is extremely important to bleed the brakes properly after any brake system work has been performed or when inspection reveals spongy brakes.

⚠ CAUTION

Pressure bleeding is not recommended. When fluid surges through the fittings, it is possible to cavitate the fluid and create air in the system. In addition, the fluid stored in a pressure bleeder may be contaminated. Always use fresh DOT 4 brake fluid from a sealed container.

Keep these points in mind when bleeding hydraulic brakes:

- The master cylinder reservoirs have limited capacities. It is easy to empty them during the bleeding procedure. This introduces air into the system which you are trying to purge. Watch the reservoir closely and add fluid when necessary to prevent air from entering the system.
- Apply only light to moderate pressure to the lever or pedal when bleeding the brake system. Extreme

pressure will cause a surge of fluid through the small orifices of the brake system when the bleeder screw is opened and introduce air into the system by means of cavitation.

- Small amounts of air can become trapped in the banjo bolt fittings at the master cylinder(s) and junction points of brake lines. These fittings can be purged of air by following a standard bleeding procedure at these fittings (instead of the bleed screw on caliper) if necessary to speed the bleeding process. This is usually only needed if system was completely drained of fluid. Bleed each line connection, starting with the fitting closest to the master cylinder, working toward the caliper, and ending with the bleed screw.
- Always torque banjo bolts and other brake system fittings to specified torque.
- Change fluid every 2 years, or when fluid is dark or contamination is suspected.

Brake Fluid Replacement & Bleeding

This procedure should be used to change fluid or bleed brakes during regular maintenance, or after complete brake service. Brake fluid may damage painted or plastic surfaces. Take care not to spill, and wipe up any spills immediately. Cover parts to avoid damage.

1. Clean the reservoir cover.



2. Remove the two T-15 Torx™ screws from the cover.
3. Carefully remove the cover and diaphragm assembly from the reservoir.
4. Under the cover, inspect the vent slots under the bellows and remove any debris or blockage.
5. Bleed or replace the fluid by attaching a clear hose from the caliper bleeder fitting to a clean container. Be sure the hose fits tightly on the bleeder fitting.
6. Pump the brake lever a few times and hold.
7. Slowly open the bleeder fitting and let the old fluid or air escape. You will feel the lever release as you let the fluid or air escape.
8. Pump the brake lever a few times and hold it again.

9. Repeat steps 7 and 8 until you see new brake fluid coming from the caliper bleeder fitting or if you are bleeding the air, repeat this step until you see only fluid coming out. This may take several intervals.



10. Torque the bleeder screw to 8-11 ft-lb (11-15 N-m).

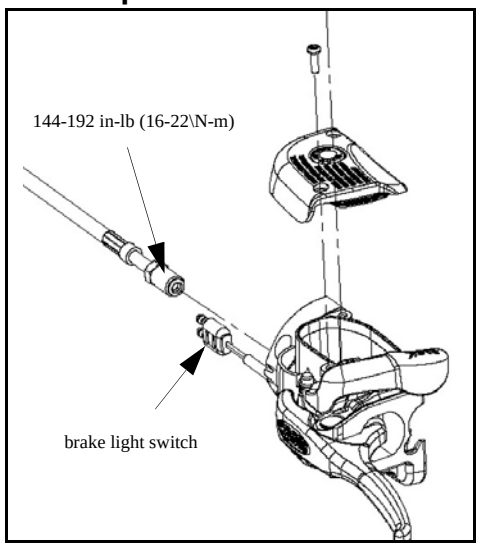
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Bleeder Screw: 8-11 ft-lb (11-15 N-m)

11. When adding fluid, add DOT 4 brake fluid to 1/4-5/16" (.6-.8 cm) from the reservoir top.
12. Install cover and diaphragm assembly.
13. Tighten the cover screws to 16-20 in-lb (1.8-2.3 N-m).

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Cover Screws: 16-20 in-lb (1.8-2.3 N-m)

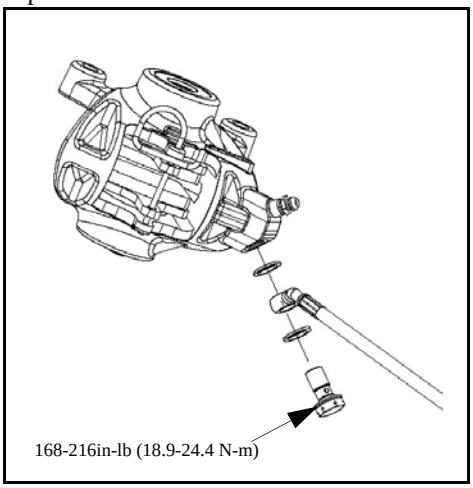
14. Field test machine before putting into service. Check for proper braking action and lever reserve. Lever reserve is when the lever is firmly applied, the lever reserve should be no less than 1/2" (1.3 cm) from the handlebar.
15. Verify that the sight glass indicates a full reservoir.
16. Check brake system for any fluid leaks.

Brake Line Replacement



Follow these steps if the brake line is to be replaced.

1. If needed bleed the brake system by attaching a clear hose to the caliper bleed fitting.
2. Attach the other end to a Mity Vac or similar vacuum tool.
3. Bleed the system of brake fluid.
4. Note the orientation of the brake line. The brake line will need to be replaced in the same orientation.
5. Remove the brake line from the caliper. Cap or cover the end to catch any brake fluid that may still be in the line.
6. Loosen the brake line from the master cylinder 1/4 to 1/2 turn.
7. Remove the 4 screws that hold the master cylinder to the handlebar. This will separate the master cylinder from the switch pack.



8. Unplug the brake light switch harness from the master cylinder.
9. Remove the brake line from the master cylinder.
10. Install new brake line on caliper and orientate it as noted in step 4.

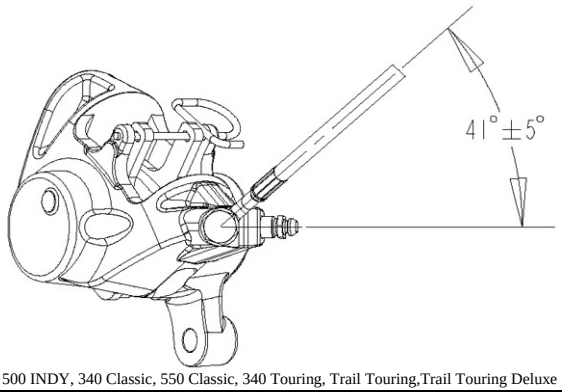
11. Torque the caliper banjo bolt to 168-216 in-lb (19-24 N-m).

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Caliper Banjo Bolt: 168-216 in-lb (18-24 N-m)

12. Insert the new brake line and install into the master cylinder. Torque the brake line to 144-192 in-lb (16-21 N-m).

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Brake Line: 144-192 in-lb (16-22 N-m)

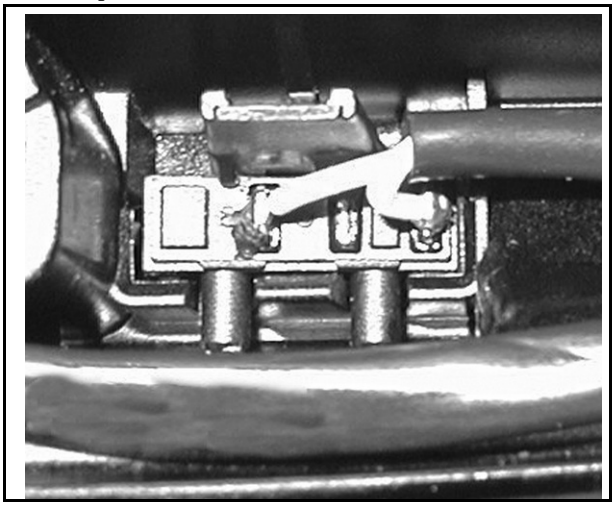
13. Tighten the brake line into the master cylinder in an orientation so that the line does not have any sharp bends when it is installed on the handlebar.
14. Route the brake light switch in the harness correctly.
15. Place the switch pack with the master cylinder onto the handle bar. Two smaller screws should be placed on the top and the longest screw is placed on the lower right.
16. Follow the bleeding procedure. See “Brake Fluid Replacement & Bleeding” on page 7.20.



500 INDY, 340 Classic, 550 Classic, 340 Touring, Trail Touring,Trail Touring Deluxe

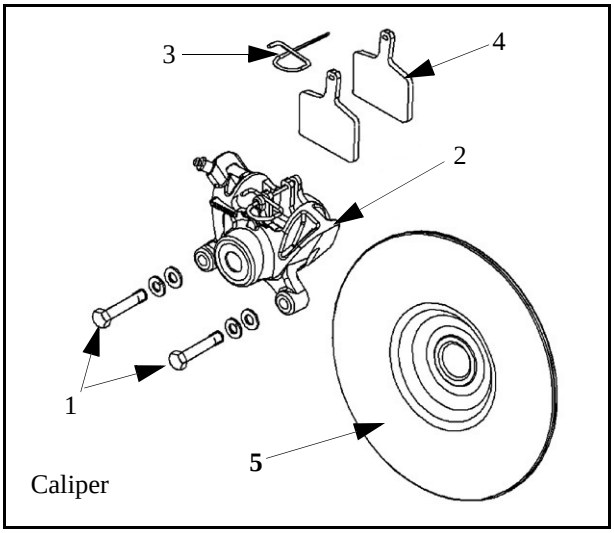
Brake Light Switch Replacement

1. Remove the 4 screws that hold the master cylinder to the handlebar. This will separate the master cylinder from the switch pack.



2. Unplug the brake light switch harness from the master cylinder.
3. Unplug the brake light switch from the master cylinder.
4. Replace faulty brake light switch into the master cylinder and route wires correctly.
5. Plug the brake switch back into the harness.
6. Replace the master cylinder to the switch pack and insert the smaller screws on the top, the longest one goes into the lower right side.

CALIPER



Caliper

Caliper Removal

1. Remove the two caliper bolts that hold the caliper to the chaincase.
2. Remove the caliper from the brake disc.

Caliper Replacement

The only serviceable item in the brake caliper is the brake pads, piston and seals. If any service is required of the caliper a new caliper is available.

1. The brake line will need to go in the same orientation as it was when it is replaced. Note the orientation of the brake line before removing it.
2. Remove the banjo bolt from the brake line and tie up so that all the brake fluid does not leak out.
3. On a liquid cooled caliper, you will need to drain the coolant from the coolant hoses.
4. Remove the two bolts (1) holding the caliper (2) to the chaincase.
5. Remove the caliper from the chaincase.

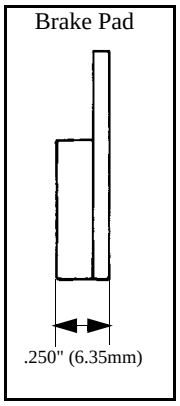
Caliper Assembly

1. Replace caliper bolts (1) and torque them to 18-20 ft-lb (24-27 N-m).

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Caliper Bolts: 18-20 ft-lb (24-27 N-m)

2. On a liquid cooled caliper, hook up the coolant lines.
3. Place the brake line on the caliper in the same orientation as it was before it was removed.
4. Clean the threads of the banjo bolt and the threads in the caliper.
5. Follow Brake Line Replacement. See “Brake Line Replacement” on page 7.21.
6. Install banjo bolt into the caliper and torque it to 168-216 in-lb (19-24 N-m).
7. Bleed the brakes. See “Brake Fluid Replacement & Bleeding” on page 7.20.
8. On a liquid cooled caliper you will need to bleed the cooling system of any trapped air.

Brake Pad Replacement



Brake pads need to be replaced if the total thickness of the pads and backing are less than .250" (6.35mm).

1. Remove brake pad retaining pin (3).
2. Remove the brake pads (4).
3. Inspect the brake disc (5) for any wear.
4. Replace brake pads in reverse order of removal.

Brake Disc Replacement

The brake disc should be replaced if the thickness of the disc is below .193"(.49cm).

1. Remove the chaincase. See “Chaincase Removal” on page 7.8.
2. Slide the brake disc from the jackshaft.
3. Check the jackshaft for any damage.
4. Replace the o-ring on the jackshaft
5. Replace the brake disk.
6. Assemble the chaincase.

WIDETRAK BRAKE CALIPER

Removal

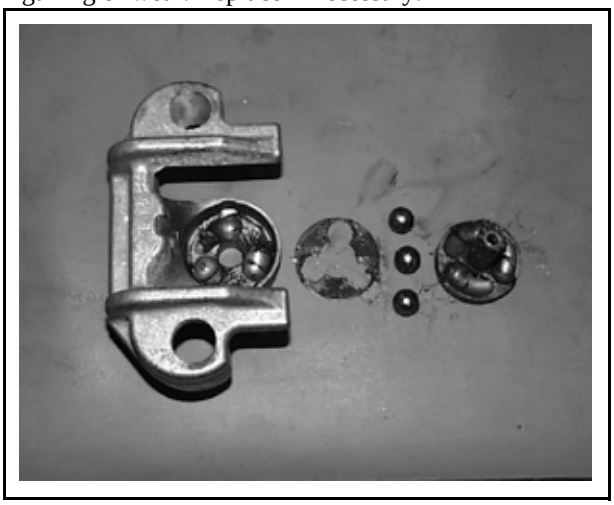
1. Remove brake cable.
2. Remove retaining bolts, making note of location of hex head bolt (with flat washer) and recessed Allen bolt.

NOTE: Before performing next step, note position of two spring clips.

3. Remove upper guide bushing and pads. Remove lower guide bushing. Inspect pads and replace if worn beyond service limit.
4. With actuating arm facing up, carefully remove tension from the return spring.



5. Remove the arm using care not to lose the balls, ball spacer, or lifter ramp.
6. Inspect balls, ball spacer, lifter ramp and caliper housing for galling or wear. Replace if necessary.

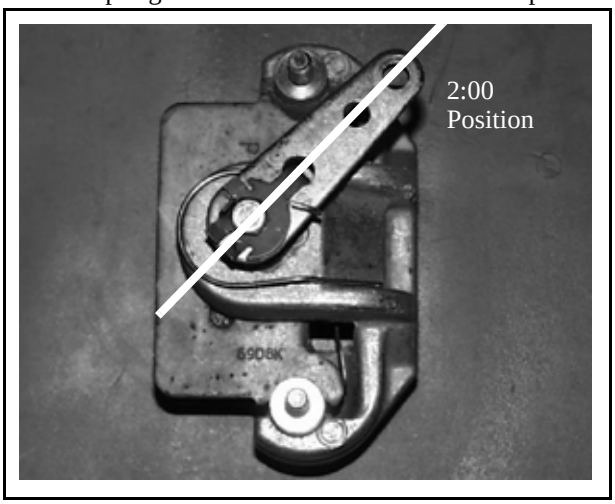


Assembly

1. Apply a light film of grease to balls and ball spacer. Install in caliper housing.
2. Install lifter ramp.

NOTE: Ramp may be installed in any position.

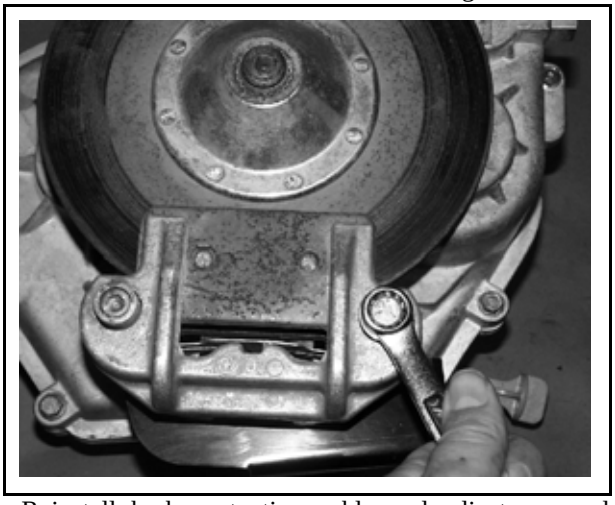
3. Install spring and arm with arm located in 2:00 position.



4. Install lower guide bushing and both spring clips. Place pads against lower bushing spring clip and tip into position.
5. Install upper guide bushing.

Installation

1. Install hex head bolt with washer in top guide bushing. Install Allen head bolt in recessed bushing.



2. Reinstall brake actuating cable and adjust as needed. Tighten cable lock nuts securely.

CHAPTER 8

FRONT SUSPENSION & STEERING

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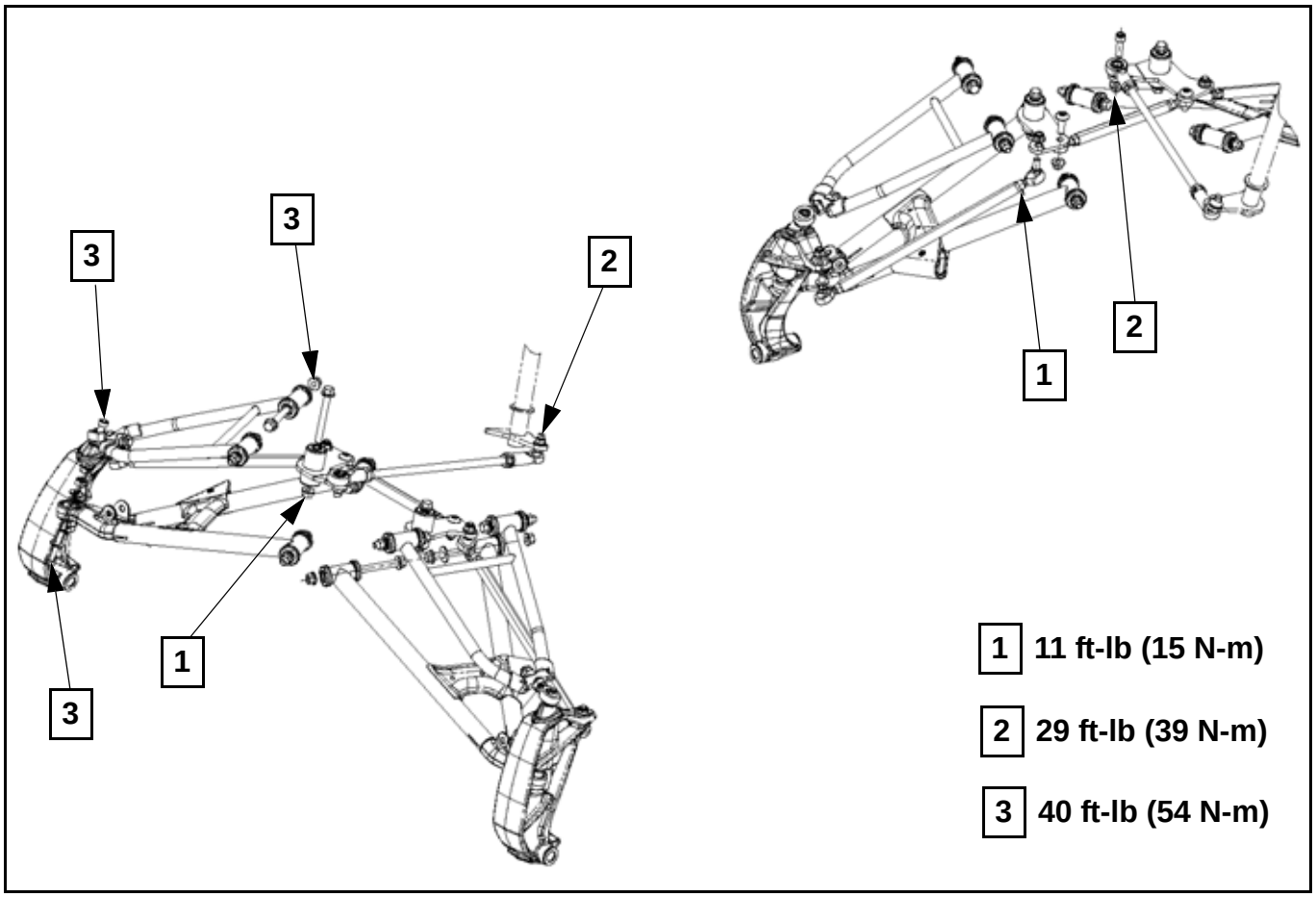
MODEL FRONT SUSPENSION TYPE

Front Suspension Type by Model

FRONT SUSPENSION	MODEL
Edge LX	340 LX, 340 Touring
Edge	500 XC SP, 550 LX, SuperSport, Trail Touring Deluxe
Edge RMK	Trail RMK
Switchback	600 IQ Switchback (Carb and CFI)
IQ RMK	600 RMK 144/155, Dragon RMK
Widetrack	Widetrack (GenII)

FRONT SUSPENSION TORQUE & SPECIFICATIONS

IQ/IQ LX/IQ RMK/Switchback



= T	
Tie Rod Lock Nuts	11 ft-lb (15 N-m)
Draglink Fasteners and Tie Rod	29 ft-lb (39 N-m)
Upper and Lower Spindle and Control Arm fasteners	40 ft-lb (54 N-m)

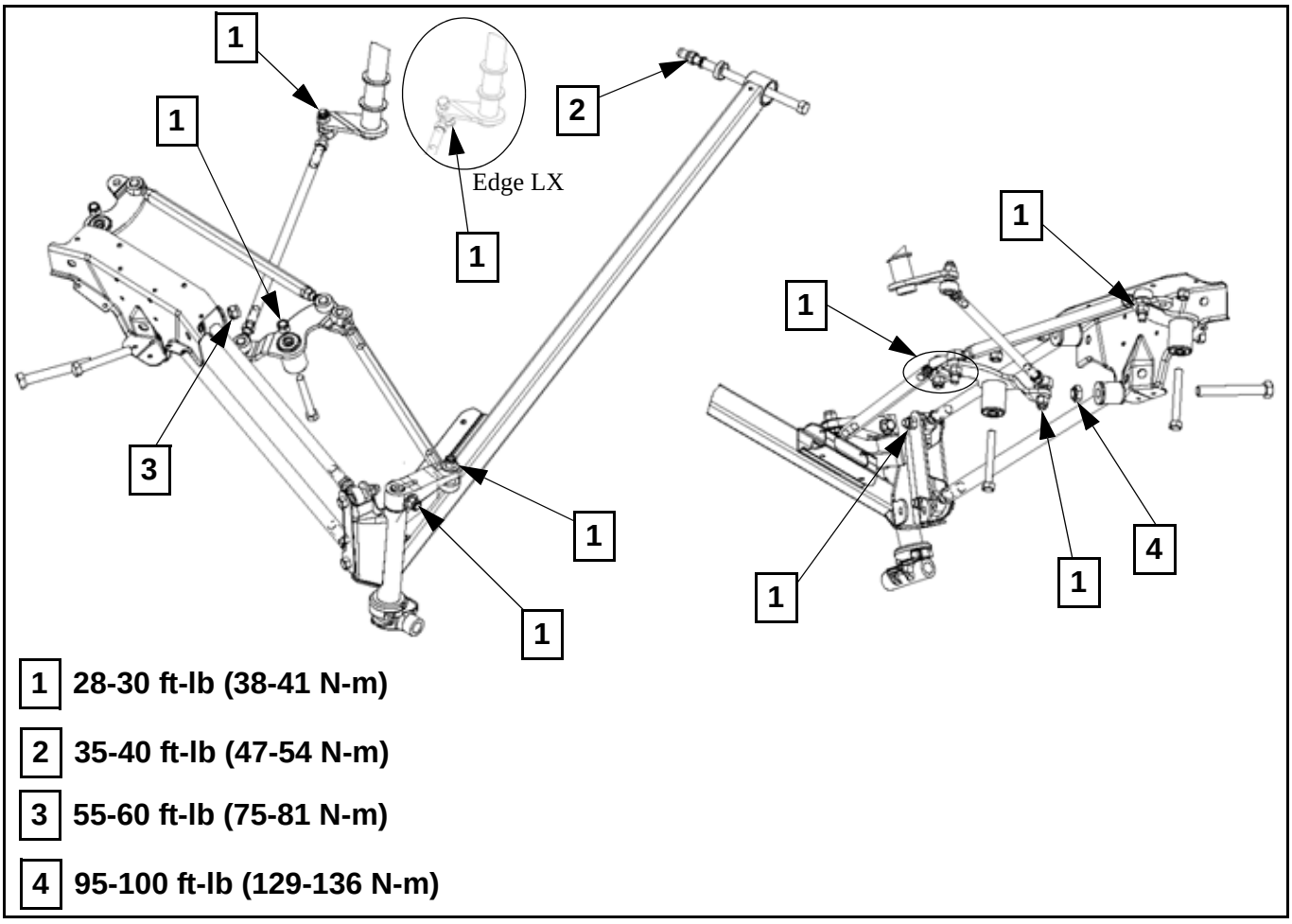
IQ RMK Specifications

ITEM	MEASUREMENT
Camber	2.17" ±.31" / 55 ± 8mm
Toe	0-.12" / 0 - 3mm
Width (skis off the ground)	38.67" / 98.2 cm

IQ/IQ LX/Switchback Specifications

ITEM	MEASUREMENT
Camber	2.25" ±.31" / 57 ±8mm
Toe	0-.12" / 0 - 3 mm
Width (skis off the ground)	41.16" / 104.5 cm

Edge/Edge LX



1 **28-30 ft-lb (38-41 N-m)**

2 **35-40 ft-lb (47-54 N-m)**

3 **55-60 ft-lb (75-81 N-m)**

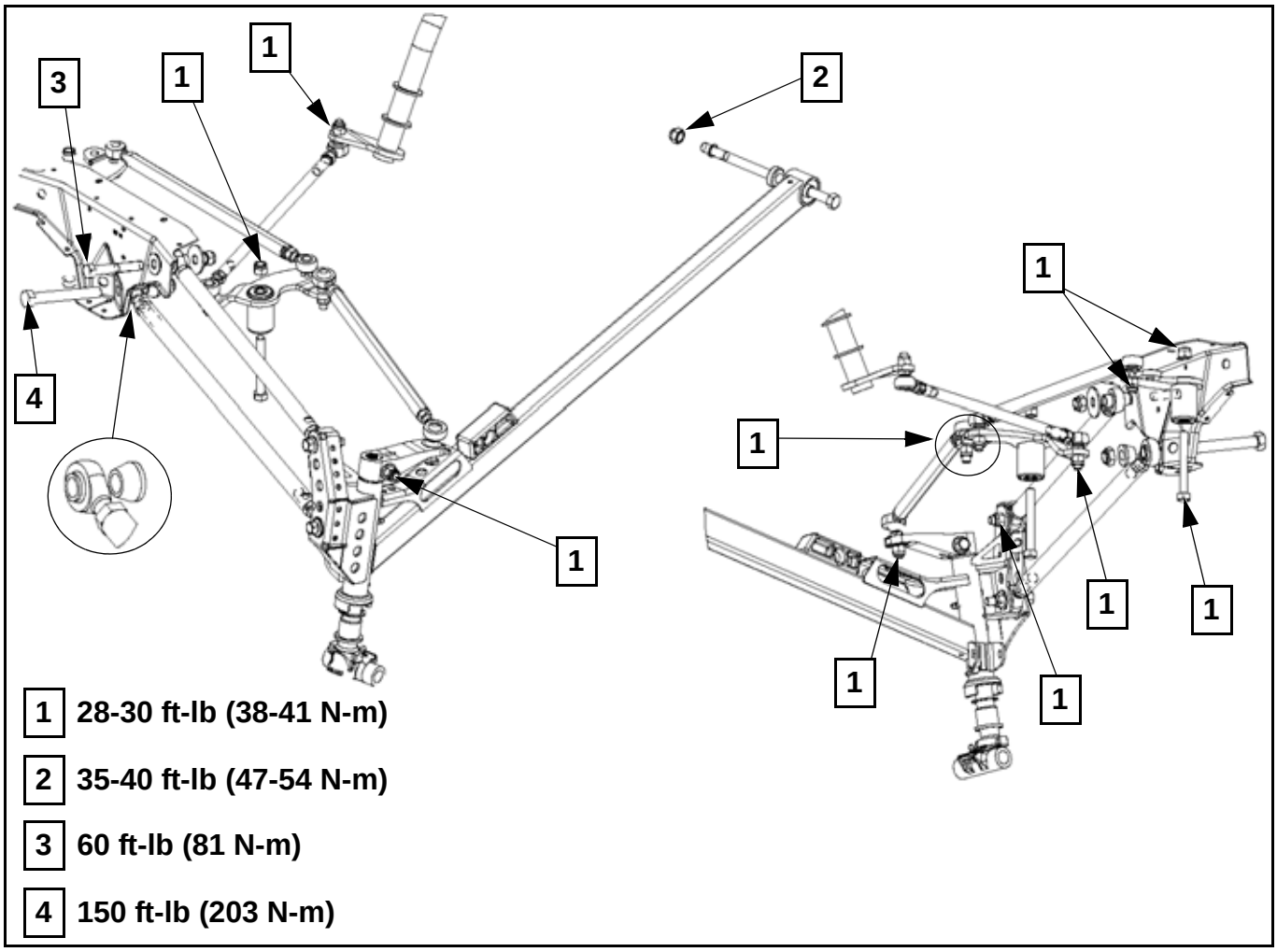
4 **95-100 ft-lb (129-136 N-m)**

= T	
Drag link fasteners, Steering arm fasteners, Tie rod fasteners	28-30 ft-lb (38-41 N-m)
Trailing arm fastener	35-40 ft-lb (47-54N-m)
Upper Radius Rod fasteners	55-60 ft-lb (75-81 N-m)
Lower Radius Rod fasteners	95-100 ft-lb (129-136 N-m)

Edge/Edge LX Specifications

ITEM	MEASUREMENT
Camber	.59" ±.31" / 15 ± 8mm
Toe	.12 - .25" / 3-6mm
Width	40.44" / 102.7cm

Edge RMK

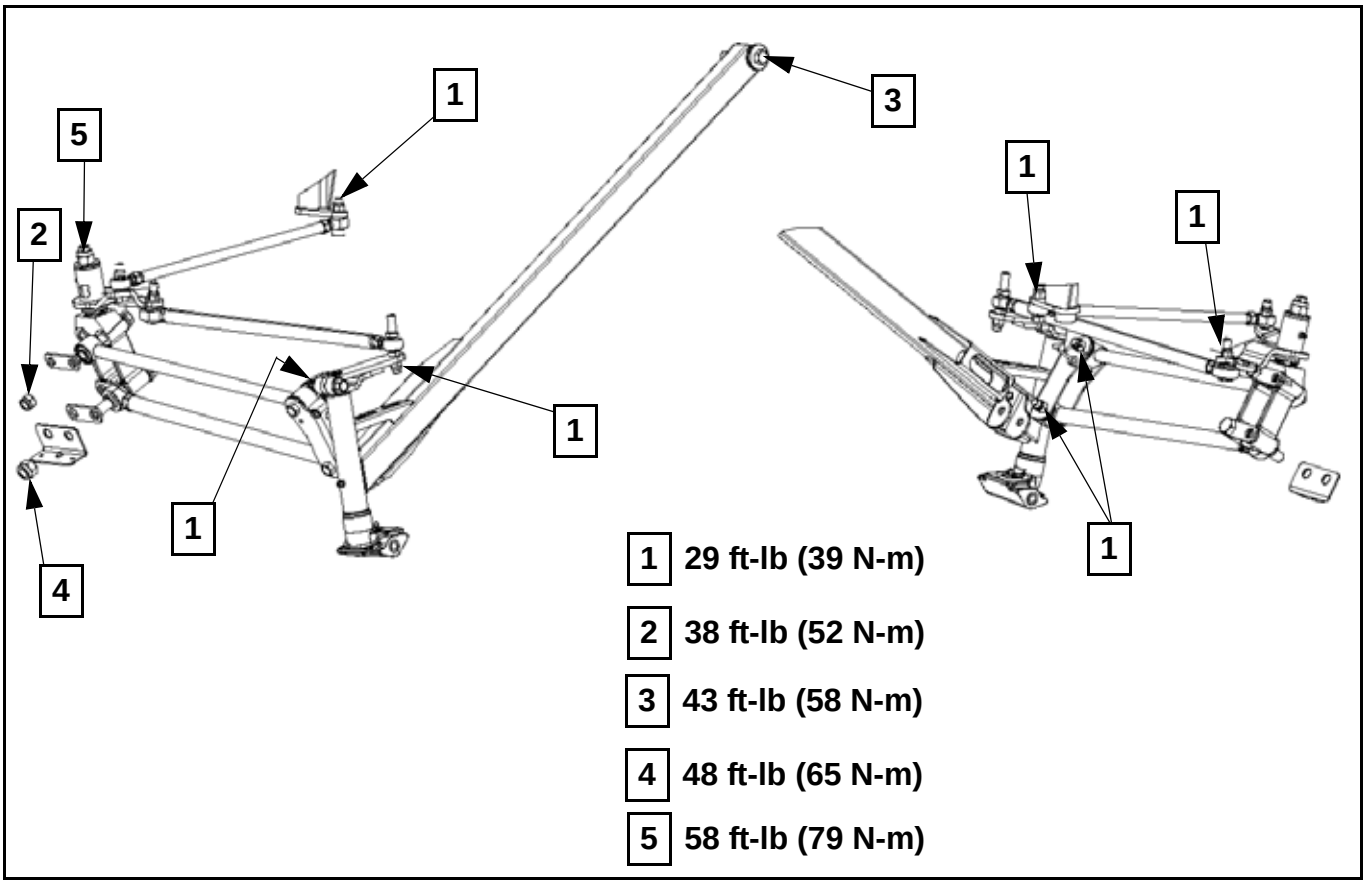


= T	
Drag link fasteners, Steering arm fasteners, Tie rod fasteners	28-30 ft-lb (38-41 N-m)
Trailing Arm fastener	35-40 ft-lb (47-54N-m)
Upper Radius Rod fasteners	60 ft-lb (81 N-m)
Lower Radius Rod fasteners	150 ft-lb (203 N-m)

Edge RMK Specifications

ITEM	MEASUREMENT
Camber	.735" ±.31" / 18.7 ± 8mm
Toe	.12 - .25" / 3-6mm
Width	41" / 104 cm

Widetrack LX



= T	
Drag link fasteners, Steering arm fasteners, Tie rod fasteners	29 ft-lb (39 N-m)
Upper Radius Rod (Inner)	38 ft-lb (52 N-m)
Trailing arm fastener	43 ft-lb (58 N-m)
Lower Radius Rod (Inner)	48 ft-lb (65 N-m)
Center Steering Arm	58 ft-lb (79 N-m)

Widetrack LX Specifications

ITEM	MEASUREMENT
Camber	.82" ±.72" / 21 ± 18mm
Toe	0-.12" / 3 mm
Width	37.6" / 95.5 cm

FRONT SUSPENSION ADJUSTMENT PROCEDURES

SET UP AND ADJUSTMENTS

Spring preload is one of the adjustment options which affects ride. Preload is the amount of pressure at which the spring is held. The longer the installed length of the spring, the less the amount of pre-load; the shorter the installed length of the spring, the more the amount of pre-load. An increase in IFS shock spring pre-load will result in an increase in ski pressure.

To adjust front spring preload on threaded adjust models, grasp the spring and turn in a clockwise direction (as viewed from the bottom of the shock) to increase the preload. Turn in a counterclockwise direction to decrease preload.

In the adjacent illustration, high preload and low preload positions are depicted.

When adjusting, be sure springs on both the left and right sides of the machine are at the same adjustment.

For the best ride the spring preload should be as low as possible. Set the preload to use the full travel of the ski shock with occasional light bottoming.

⚠ CAUTION

If the plastic nut is unscrewed from the threaded body the nut will break. Always leave one thread showing above the plastic nut or the spring coils will stack, resulting in damage.

For the best ride the spring preload should be as low as possible. Set the preload to use the full travel of the ski shock with occasional light bottoming. To determine if your machine is using full travel, push the shock jounce bumper down as far as it will go on the shock rod and test ride the machine.

The bumper will move up on the rod in direct relation to the amount of travel. For example, if the shock travel is full, the bumper will be seated at the top of the shock.

Remove the existing spring and install the next highest rate spring, or reduce the preload on the existing spring and change the shock valving to obtain the desired effect.

NOTE: Shock valving can only be adjusted or changed on models that can be serviced.

IFS SHOCK SPRINGS

IFS Shock Springs

PART NUMBER	TOTAL # OF COILS	RATE #/IN)	FREE LENGTH	WIRE VIA.	I.D."	O.D."	TABBED?
7041261	13	105	10.25	0.312	1.84	2.6	NO
7041396	13.35	50	11.88	.283	1.89	2.82	Yes
7041398	12.72	75	11.88	.312	1.89	2.88	Yes
7041405	13.40	65	11.88	.306	1.89	2.82	Yes
7041489	14.70	74/120	11.30	.312	1.89	2.75	Yes
7041491	13	185	13.50	.438	1.90	3.60	Yes
7041520	10.60	90	10.50	.283	1.89	2.57	No
7041528	17.57	74/160 var	11.30	.306	1.89	2.53	Yes
7041529	19.39	50/140 var	11.30	.283	1.89	2.50	Yes
7041530	14.42	70/105 var	10.50	.283	1.89	2.50	Yes
7041549	9.17	140	10.75	.331	1.89	2.75	Yes
7041550	8.29	120	10.80	.306	1.89	2.75	Yes
7041551	9.55	100	10.75	.306	1.89	2.75	Yes
7041552	9.09	80	10.75	.283	1.89	2.75	Yes
7041553	11.46	60	11.33	.283	1.89	2.75	Yes
7041554	9.09	80	10.75	.283	1.89	2.75	Yes
7041571	10.40	70	10.50	.263	1.89	2.53	No
7041573	9.28	160	10	.331	1.89	2.91	Yes
7041574	10.32	140	10.25	.331	1.89	2.91	Yes
7041575	10.36	120	11.42	.331	1.89	2.87	Yes
7041576	9.55	100	10.80	.306	1.89	2.86	Yes
7041591	12.79	80	12.25	.306	1.89	2.75	Yes
7041598	9.71	105	9.33	.312	1.89	2.894	Yes
7041613	14.01	75	11.88	.295	1.89	2.62	Yes
7041668	6.94	70	4	.219	1.89	2.34	No
7041669	6.27	80	4	.218	1.89	2.33	No
7041670	6.28	90	4	.225	1.89	2.35	No
7041671	11.71	160	9	.331	1.89	2.56	No
7041672	10.63	180	9	.331	1.89	2.56	No
7041673	12.72	200	9	.362	1.89	2.62	No
7041674	12.72	220	9	.362	1.89	2.62	No
7041677	10.43	140	9	.306	1.89	2.52	No
7041678	8.65	100	7	.262	1.89	2.43	No
7041683	12.12	80	11.88	.312	1.89	2.87	Yes
7041698	5.84	100	4	.225	1.89	2.35	No
7041699	5.75	120	4	.235	1.89	2.37	No
7041701	10.57	120	9	.295	1.89	2.49	No

IFS Shock Springs

PART NUMBER	TOTAL # OF COILS	RATE #/IN)	FREE LENGTH	WIRE VIA.	I.D."	O.D."	TABBED?
7041820	5.98	140	4	.250	1.89	2.43	No
7041821	5.91	160	4	.262	1.89	2.49	No
7041826	9.19	160	7	.306	1.89	2.54	No
7041826	8.85	180	7	.312	1.89	2.54	No
7041828	9.61	200	7	.331	1.89	2.59	No
7041829	8.92	220	7	.331	1.89	2.59	No
7041927	16.15	68/160	13	.295	1.89	2.54	Yes
7041950	13.80	68/160	11.57	.331	1.89	3.125	Yes
7042052	11.7	110	12	0.343	1.87	3	NO
7042074	11.625	90/180 Var	10.65	0.343	1.89	3.2	YES
7042187	13.76	68/160	12.55	0.343	1.89	3.18	YES
7042195	14	90/180 Var	13	0.362	1.89	3.2	YES
7042263	8.67	80/110 Var	10.78	0.331	1.89	3.25	YES
7042314	10.64	75	10.01	0.281	1.89	2.71	YES
7042315	10.89	55	9.85	0.262	1.89	2.66	YES

SPRINGS

Two types of springs are employed in Polaris suspensions, coil springs and torsion springs. Following is some of the terminology used when referring to coil springs.

- Free length - the length of a coil spring with no load applied to the spring
- Installed length - the length of the spring between the spring retainers. If the installed length of the spring is less than the free length, it will be pre-loaded.
- Spring rate - the amount of force required to compress a coil spring one inch. For example, if 150 pounds of force are required to compress a spring 1 inch, the spring rate would be 150 #/in.
- Straight rate spring - the spring requires the same amount of force to compress the last one inch of travel as the first one inch of travel. For example, if a 150 #/in. spring requires 150 pounds of force to compress it one inch, 300 pounds of force would compress it two inches, 450 pounds of force would compress it three inches, etc.
- Progressively wound spring - the rate of the spring increases as it is compressed. For example, a 100/200 #/in. rate spring requires 100 pounds of force to compress the first one inch, but requires 200 additional pounds to compress the last one inch.

When a bump is encountered by the suspension, the force of the bump compresses the spring. If the force were 450 pounds, a 100 #/in. spring would compress 4.5 inches. A 150 #/in. spring would only compress 3 inches. If the suspension had 4 inches of spring travel the 100 #/in. spring would bottom out, while the 150 #/in. spring would have one inch of travel remaining.

COMPRESSION DAMPING ADJUSTABLE SHOCKS

Snowmobiles equipped with the Indy Select or Ryde FX shocks allow the driver to make adjustments to the compression valving by turning the screw located near the base of the shock.

Locate the adjustment screw near the base of the shock.

By turning the screw clockwise (a small screwdriver or dime work well), the compression valving is increased, stiffening the ride. To soften the ride, reduce the compression by turning the screw counter-clockwise. A great deal of ride performance is accomplished with a mere 1/2 to 1 turns. There are approximately 3 full turns of adjustment available.

If the suspension is “bottoming” tighten the compression screw clockwise in 1/2 turn increments until the bottoming stops. Backing off 1/4 turn counter-clockwise at this point should give you the best possible ride ensuring use of the full travel of the suspension. The opposite procedure should be used if the suspension is too stiff upon initial set-up.

If bottoming continues after the screw is turned in full clockwise, the compression spring should be adjusted with the threaded adjustment collar. Back the screw out to the original starting position after the compression spring has been adjusted.

Riding conditions are ever changing. Keep in mind the compression damping adjustable screw can be adjusted at any time to achieve the best possible ride in any condition.

NOTE: Whenever shocks are replaced or reinstalled for any reason, the adjustment screw should be located toward the inside of the suspension. Access to the adjuster is not possible if installed differently.

SHOCK INFORMATION

IFS Shock Fastener Torques

UNIT	IFS UPPER	IFS LOWER
ALL	29 ft-lb (39 N-m)	29 ft-lb (39 N-m)

IFS SHOCK SPECIFICATIONS

IFS Shocks

SHOCK PN	BRAND	EXTENDED LENGTH (IN)	COLLAPSED LENGTH (IN)	STROKE (IN)	SHOCK ROD (IN)	IFP DEPTH (IN)	SHAFT PN	PSI
7041535	Arvin	13.3	10.64	4.47	.49	N/A	N/A	N/A
7042258*	Arvin	18.00	11.8	6.2	.49	6.92 t	1700228	200
7043054	Arvin	17.97	11.83	6.14	.49	N/A	N/A	N/A
7043141*	Fox	18.00	11.80	6.20	.50	1.420 b	1500713	200
7043095*	Walker	18.00	11.738	6.27	.625	2.250	1800102	200
7043049	Arvin	17.02	12.77	5.75	.49	N/A	N/A	N/A
7043090*	Arvin	17.00	11.20	5.80	.49	6.54 t	1700231	200
7041932	Arvin	16.28	12.89	5.15	.49	N/A	N/A	N/a
7041918	Arvin	16.35	11.09	5.26	.49	N/A	N/A	N/A
7042197	Arvin	17.28	13.78	5.26	.49	N/A	N/A	N/A
7043082*	Arvin	16.25	12.76	5.25	.49	6.27 t	1700025	280
7043206*	Walker	18.00	10.13	6.26	.625	2.25r	1800303	200

*=Serviceable shock

b=IFP depth measured form the bottom of the shock body

t=IFP depth measured form the top of the shock body.

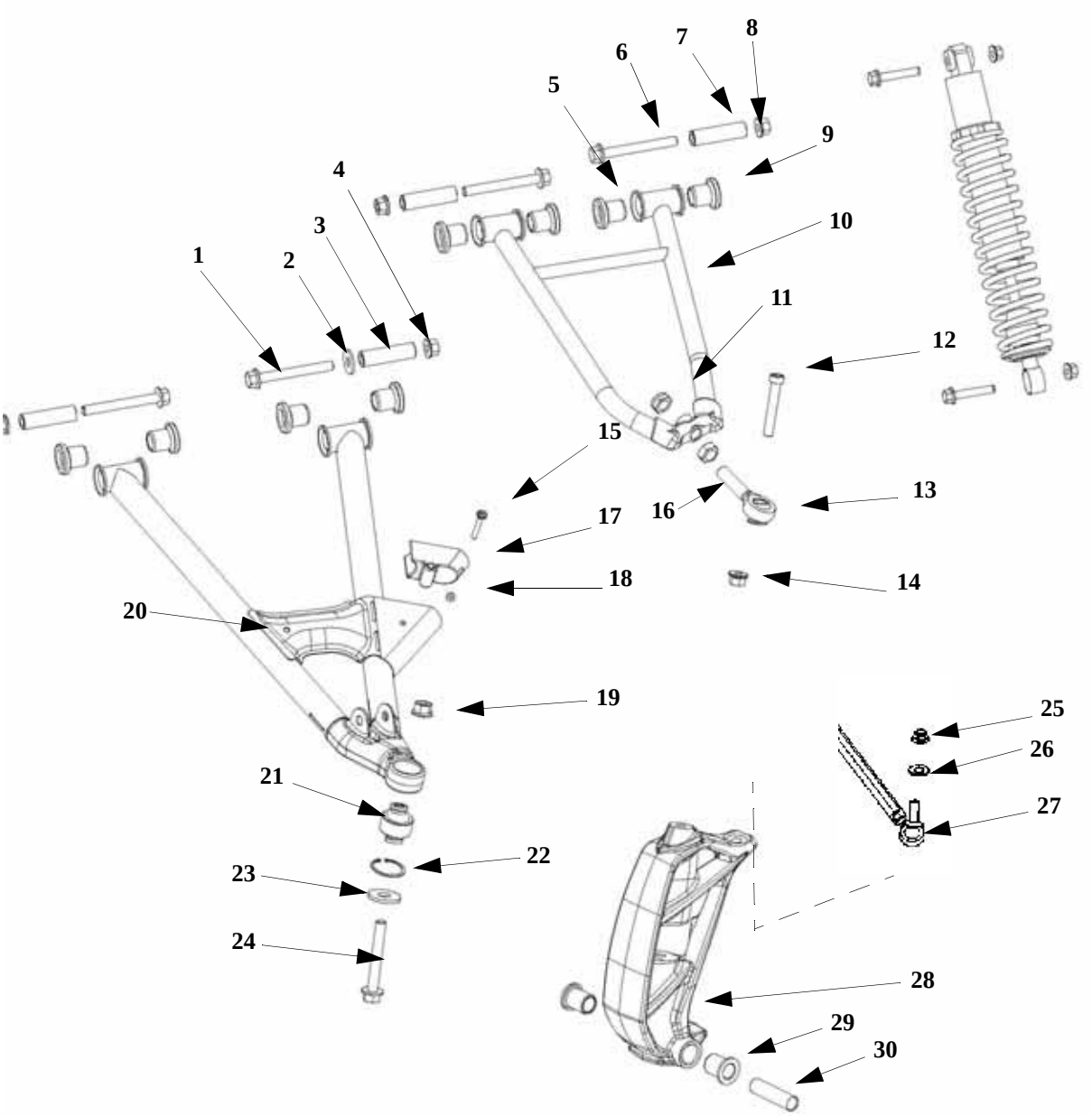
r=IFP depth measured form the top of the remote reservoir.

IFS SHOCK PRODUCTION VALVING

The valving charts are listed in compression sections and rebound sections. A compression stack will be located nearest the eyelet of the shock rod. A rebound stack will be located nearest the threaded end of the shock rod.

SHOCK PN	7042258	7043141	7043095	7043090	7043082	7043206
COMPRESSION	.700x.015 .800x.006 .900x.006 1.000x.006 1.100x.008 1.250x.006 .800x.008 1.100x.006 1.300x.008	1.125x.093 .700x.012 .700x.012 .900x.008 1.000x.008 1.100x.008 1.250x.008 .800x.008 1.100x.008 1.300x.006	.875x.090 .625x.065 .700x.006 .800x.006 .900x.006 1.000x.006 1.100x.006 .900x.012 1.200x.006 1.000x.012 1.300x.006	.700x.015 .800x.006 .900x.006 1.000x.006 1.100x.008 1.250x.006 .800x.008 1.100x.006 1.300x.008	.800x.012 .900x.012 1.000x.012 1.100x.010 1.250x.008 1.300x.010 .900x.006 1.250x.008 1.300x.008	.875x.090 .625x.065 .700x.006 .800x.006 .900x.006 1.00x.006 1.10x.006 .900x.012 1.20x.006 1.00x.012 1.30x.006
Piston Orifice	.060	.078	.052	.081	.093	.052 (shaft bleed .082)
REBOUND	1.250x.008 1.100x.008 1.000x.008 .900x.008 .800x.008 .700x.008	1.250x.008 .700x.008 1.100x.010 1.000x.010 .900x.012 .800x.012 .700x.012 .620x.093	1.200x.008 1.100x.008 1.000x.008 .900x.010 .800x.010 .700x.010 .625x.065	1.250x.008 1.100x.008 1.000x.008 .900x.008 .800x.008 .700x.008	1.250x.006 1.100x.010 1.000x.010 .900x.010 .800x.010	1.20x.008 1.10x.008 1.00x.010 .900x.010 .800x.010 .700x.010 .625x.065
ADJUSTER	N/A	N/A	1.100x.025 1.000x.025 .625x.065	N/A	N/A	1.10x.025 1.00x.025 .625x.065

IQ FRONT SUSPENSION



IQ Front Suspension

ITEM	DESCRIPTION	TORQUE SPECIFICATION / NOTES
1	Lower A-Arm pivot bolt	
2	Flat washer	Critical for spacing the bolt from the sway bar. Located on the leading edge
3	Pivot Shaft	
4	Flanged nut	40 ft-lb (54 N-m)
5	Pivot Bushing	
6	Upper A-Arm pivot bolt	
7	Pivot shaft	

IQ Front Suspension

ITEM	DESCRIPTION	TORQUE SPECIFICATION / NOTES
8	Flanged nut	40 ft-lb (54 N-m)
9	Pivot Bushing	
10	Upper control arm	
11	Camber lock nut	45 ft-lb (61 N-m)
12	Rod end bolt	
13	Rod end	
14	Flanged nut	40 ft-lb (54 N-m)
15	Screw	
16	Jam nut	45 ft-lb (61 N-m)
17	Swaybar slide	
18	Nut	5 ft-lb (7 N-m)
19	Nut	40 ft-lb (54 N-m)
20	Lower control arm	
21	Bearing	
22	Retaining ring	
23	Washer	
24	Bolt	
25	Steering arm nut	29ft-lb (39 N-m)
26	Washer	
27	Tie Rod	
28	Spindle	
29	Bushing ski pivot bushing	
30	Pivot bushing	

Spindle Removal

1. Securely support the front of the machine so that it is off the floor.
2. Remove the ski(s).
3. Remove the flanged nut (14) on bottom of the lower spherical bearing (13).
4. Remove the upper rod end bolt (12) from the top of the spindle.
5. Remove the tie rod (27) from the spindle, by removing the nut (25) and washer (26).
6. Remove the nut (19) from the lower spherical bearing.
7. Remove the lower spherical bearing bolt (24) and washer (23).
8. Remove the spindle (28).

Spindle Assembly

1. Replace the tie rod (27) and torque the bolt (25) to 29 ft-lb (39 N-m).
2. Place the spindle onto the lower spherical bearing.
3. Place the nut (19) on the lower spherical bearing bolt (24) and torque to 40 ft-lb (54 N-m).
4. Place the spindle onto the upper rod end.
5. Place the camber bolt (12) and torque the nut (14) to 40 ft-lb (54 N-m).

Lower Spherical Bearing Replacement

1. Remove the spindle.
2. Remove the snap ring (22) from the lower spherical bearing.
3. Replace the lower spherical bearing (21).

4. Replace snap ring (22).
5. Install spindle.
6. Install the ski(s).

UPPER / LOWER CONTROL ARM REMOVAL

1. Remove the spindle(s) and shock(s).
2. Remove the upper and lower control arm(s) bulk head bolts (1,6).
3. Remove the upper or lower control arm (10,20) and remove all pivot bushings (5,9), and all pivot shafts (3, 7).

Upper / Lower Control Arm Installation

1. Replace the upper or lower control arm bushings (5,9) and pivot shafts (3, 7) in the control arm(s).
2. Replace the upper or lower control arm(s) into the bulkhead.
3. Replace the upper or lower control arm bolts (1,6). Torque to 40 ft-lb (54 N-m).

NOTE: A spacer washer (2) is located on the lower rearward mounting area, and should be located at the bolt head.

STEERING

INSPECTION

Prior to performing steering alignment, inspect all steering and suspension components for wear or damage and replace parts as necessary. Refer to steering assembly exploded views in this chapter for identification of components and torque values of fasteners. While disassembling, make notes of what direction a bolt goes through a part, what type of nut is used in an application, in which direction do the steering arms go on - weld up or weld down, etc.

Some of the fasteners used in the IFS are special and cannot be purchased at a hardware store. Always use genuine Polaris parts and hardware when replacing front end components. Review steering adjustment guidelines before making adjustments.

The following components must be inspected at this time.

- Tie rods and tie rod ends
- Control arms and control arm ends
- Torsion bar and bushings / linkage (where applicable)
- Handlebars and steering post assembly
- Spindles and bushings
- Skis and skags
- Pitman arms / Idler arms
- Steering arms
- A-arms and bushings
- Shock absorbers, shock mounts, springs
- All related fasteners - check torque. Refer to steering exploded views at the beginning of this section.
- Grease all fittings.

Always follow rod end engagement guidelines. Maximum setup width must be checked whenever front suspension components are adjusted or replaced.

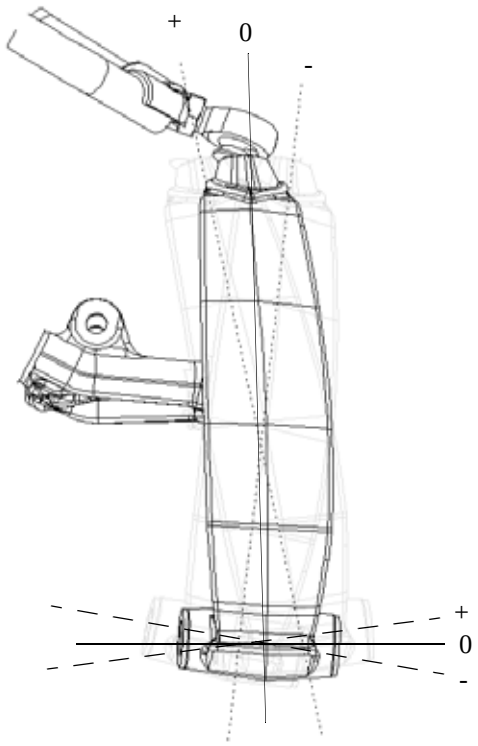
Alignment Bar Specifications

- DIAMETER: .623”-.625” (15.824-15.875mm)
- LENGTH: 45” (114.3cm)
- MATERIAL: C-1018

Camber Definition

The following definitions of camber use automotive terminology to describe positive and negative positions.

- 0 = Neutral camber. The spindle is 90° (perpendicular) to the ground.
- + = Positive camber. The bottom of the spindle is canted inward toward the chassis.
- - = Negative camber. Spindle bottom is canted outward from the chassis.



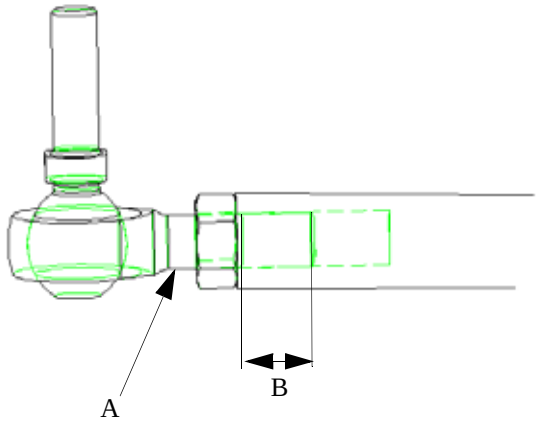
Rod End

Rod ends must be parallel to their respective mounting surface after tightening jam nut. Hold the rod end and tighten jam nut. If possible, support the edge of the rod end to keep it from rotating out of position until jam nut is tight. When rod ends are properly tightened, the rod should rotate freely approximately 1/8 turn.

Rod End Engagement

Rod ends must engage the rod a minimum of 2x the thread diameter when adjustment is complete.

Example: .4375” (11mm) rod end (A) X 2 = minimum thread engagement (B) .875” (22mm).



FRONT SUSPENSION MEASURING

Maximum width and camber measurements are to be taken with the front end elevated and shocks at full extension.

Maximum Width

Width is measured from the center of the spindles.

Toe Alignment

Toe alignment is measured at ride height. This means that the machine is on the ground and resting at normal ride height, not full rebound. Measure at a point 10” (2.54cm) forward of the ski mount bolt and 10” (2.54cm) behind the ski mount bolt, preferably on the center line of the carbide skags.

Camber

Camber measurement is taken from the top of the alignment bar to the top of the ski mount hole in the spindle with the bushing removed.

ALIGNMENT ADJUSTMENTS

Alignment adjustments should be preformed in this order.

Edge/Edge LX/Edge RMK Set Up Width

Prior to performing steering alignment, the suspension should be inspected for damage or wear and replacement parts installed as required.

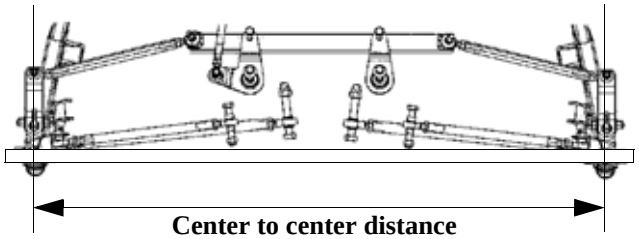
IMPORTANT: Camber, width are dimensions that depend on each other. If any adjustments have been made, each one should be checked.

⚠ WARNING

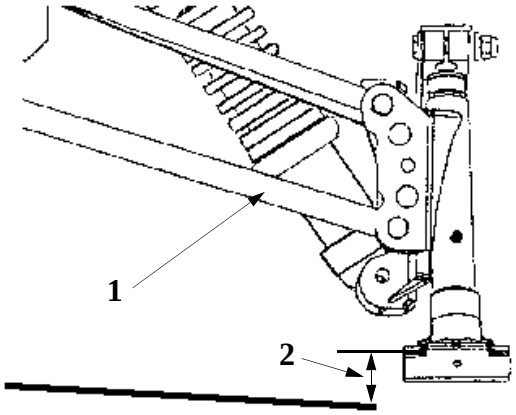
A maximum set up width is listed in “Front Suspension Torque & Specifications” on page 8.3. Maximum set up width is the maximum allowable distance between ski spindle centers at ride height. The Maximum Set Up Width specifications are maximum width measurements, and are critical to ensure adequate torsion bar engagement with the Trailing/Control Arms. If the suspension is set too wide, the torsion bar may disengage from trailing arm. Do not attempt to set the suspension wider than the specified maximum set up width.

1. Make sure that the track is properly aligned. Track alignment is critical because this will be used as a reference point for final toe out measurement. See “TRACK ALIGNMENT” on page 3.20.
2. Support the front of the machine is at ride height.
3. Remove the skis and ski pivot bushings.
4. Disconnect the torsion bar.
5. Measure spindle to chassis centering and record the measurement.
6. The spindle centering and set up width is controlled by adjusting the radius rod lengths, and must not exceed the maximum set up width listed.

NOTE: Both spindle centers should be an equal distance ± 1/8” (3mm) from the center of the chassis.



Edge/Edge LX/Edge RMK Camber Adjustment

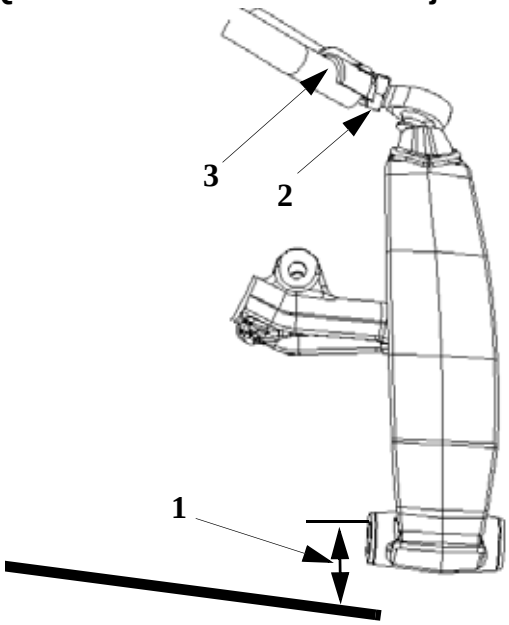


WARNING

After camber adjustment is complete, be sure to measure set up width outlined in this chapter and compare to model specifications listed. Do not attempt to set suspension wider than the specified maximum set up width. If set up width exceeds maximum, adjust upper and lower radius rods equally to maintain camber adjustment.

1. Raise the front of the machine so that the skis are off the floor 3" (7.62cm). The shocks should be at full extension.
2. Remove the skis.
3. Determine which spindle requires the greatest amount of correction by installing the alignment bar through one spindle to the other spindle. Measure the distance (2) from the top of the alignment bar to the top of the ski mount hole with the bushing(s) removed. Record measurement.
4. Remove the alignment bar and install it to the opposite side. Measure the distance (2) from the top of the alignment bar to the top of the ski mount hole with the bushing(s) removed. Record measurement
5. To adjust the camber, change the lower radius rod (1) length until alignment bar measurement is within the specified range for each spindle.
6. Once the specification is achieved, tighten all jam nut(s) and torque them to 8-14 ft-lb (11-19 N-m).
7. Re-check the set up width and compare to specification.

IQ/IQ LX/Switchback Camber Adjustment



1. Raise the front of the machine so that the skis are off the floor 3" (7.62cm). The shocks should be at full extension
2. Remove the skis.
3. Determine which spindle requires the greatest amount of correction by installing the alignment bar through one spindle to the other spindle. Measure the distance (1) from the top of the alignment bar to the top of the ski mount hole with the bushing(s) removed. Record measurement.
4. Remove the alignment bar and install it to measure the opposite side. Measure the distance (1) from the top of the alignment bar to the top of the ski mount hole with the bushing(s) removed. Record measurement
5. To adjust the camber, unlock the jam nut (2) and adjust the camber with the adjuster nut (3) until alignment bar measurement is within the specified range for each spindle.
6. Once the specification is achieved, torque the upper rod end jam nut (2) to specification.

= T

Rod End Jam Nut Torque: 45 ft-lb (61 N-m)

7. Re-check the toe alignment after changing the camber settings.

8

Handlebar Centering

1. Raise the front of the machine off the floor so that the spindles are off the floor 3”(7.62cm).
2. Insert the alignment bar through both ski bolt holes in each spindles.
3. Adjust the Toe as outlined below, until handlebar is centered.

Toe Adjustment

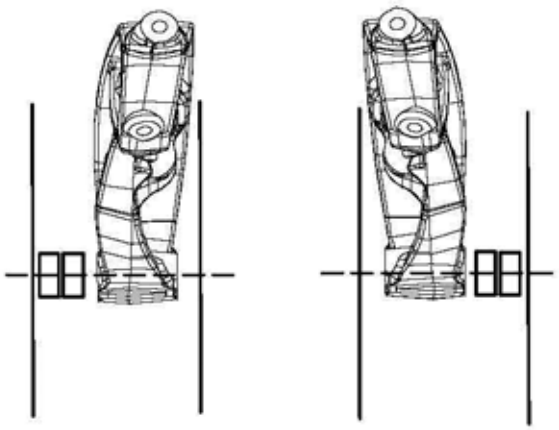
Toe is adjusted with the shocks and skis installed. Track alignment must be correct before starting this process. See “TRACK ALIGNMENT” on page 3.20.

Toe alignment is measured at ride height.

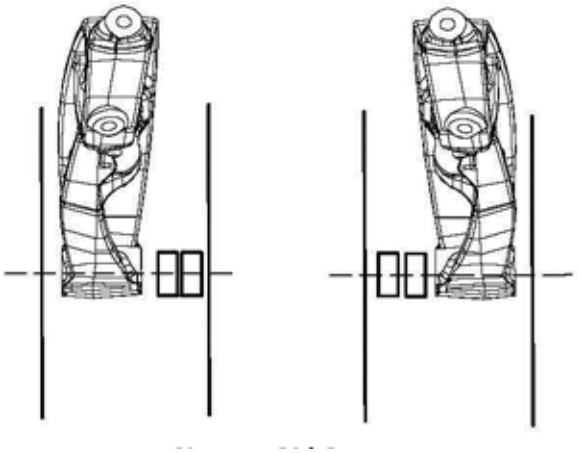
1. Lift front of the machine off the floor rock the front end up and down and then set it down gently. This will set the unit at ride height.
2. Measure and make a mark 10” (2.54cm) forward of the ski mount bolt and 10” (2.54cm) behind the ski mount bolt, preferably on the center line of the carbide skags.
3. Place a straight edge along the one side of the track. Make sure that the straight edge is touching along the length of the track.
4. Record the measurements from the edge of the straight edge to the forward ski mark and the rearward ski mark.
5. Adjust the tie rod so that the toe is set per the specifications. See “Front Suspension Torque & Specifications” on page 8.3.
6. Place the straight edge on the opposite side of the track and measure the opposite ski marks.
7. Adjust the tie rod so that the toe is set per the specifications. See “Front Suspension Torque & Specifications” on page 8.3.
8. Verify that the ski center distances are within specification from the forward marks and the rearward marks.

SKI STANCE

Adjustment (IQ RMK Only)



WIDE SKI STANCE
For maximum stability, install both of the spacers to the outside of the spindle



NARROW SKI STANCE
For maximum maneuvering, install both of the spacers to the inside of the spindle.

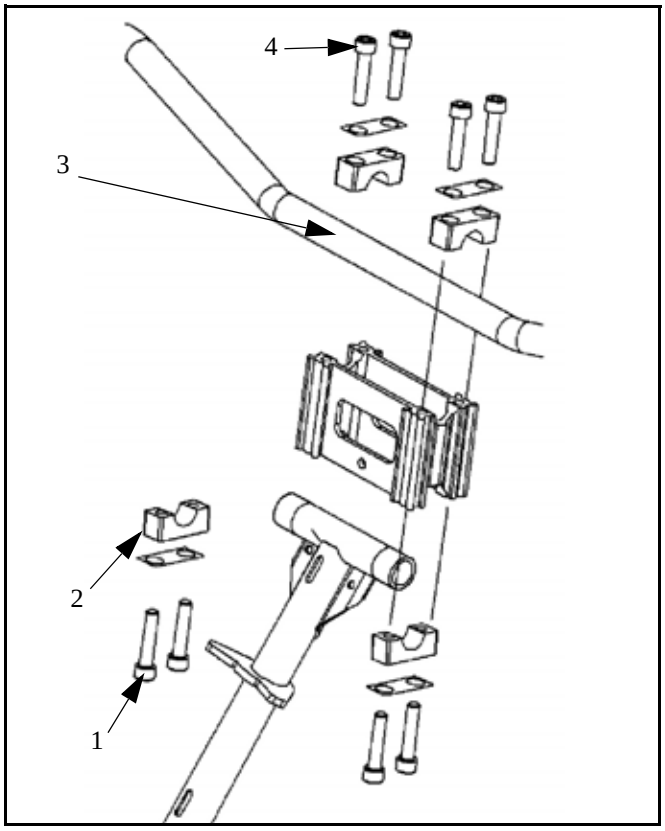
HANDLEBAR

RMK Handlebar Position

Handlebar position and handlebar angle can be adjusted to rider preference. After making handlebar adjustments, check to make sure wires are not pinched or kinked. Make sure the handlebars, brake lever and throttle lever operate smoothly and do not hit the gas tank, windshield or any other part of the vehicle when the handlebars are turned fully to the left or right.When adjustments are complete, torque the front adjuster block bolts first, then torque the rear bolts. Torque the bolts to 11-13 ft. lbs. (15-18 Nm).

1. Loosen the four bolts on the bottom (1) of the adjuster block (2).

NOTE: If necessary, pry the blocks apart with a screwdriver.



2. Adjust the handlebar (3) to the desired position.
3. Tighten the bolts to specification below.

= T
Riser Fasteners: 15-17 ft-lb (20-23 N-m)

RMK Handlebar Angle

1. Loosen the four bolts on the top (4) of the adjuster block.

NOTE: If necessary, pry the blocks apart with a screwdriver.

2. Adjust the handlebar to the desired angle.
3. Tighten the bolts to specification below.

= T
Riser Fasteners: 15-17 ft-lb (20-23 N-m)

NOTES

CHAPTER 9

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REAR SUSPENSION TYPE PER MODEL

TYPE	MODEL
Edge 121	340 LX, 500 XC SP, 550 LX, SuperSport
Edge 136	340 Touring
Edge RMK 136	Trail RMK
IQ121	600 IQ (Carb & CFI)
IQ 121 Dragon	IQ Dragon
IQ Switchback	600 IQ Switchback (Carb & CFI)
IQ RMK 144/155	600 RMK, RMK Dragon
M-10 128	600 IQ LX
M-10 136	600 IQ Touring
WideTrak	WideTrak LX

SPECIAL TOOLS

Shock Rebuilding Tools

Special Tools

PART NUMBER	DESCRIPTION
2200421	Gas Shock Recharging Kit
2201639	Shock Shaft Seal Protector .50" Diameter
2201640	Shock Shaft Seal Protector .625" Diameter
2870623	Shock Absorber Spring Compression Tool
2870803	Shock Spring Pre-Load Adjustment Too
PS-45259	Gas Fill Tool
9917736	VIDEO-Rebuilding Mono Tube Shocks
9917737	VIDEO-Rebuilding Remote Reservoir Shocks

Ryde FX Shock Special Tools

PART NUMBER	DESCRIPTION
PS-45259	Gas Fill Tool and Gauge (Incl. 5 needles)
PS-45259-1	Gas Fill Needles replacement pack
PS-45259-2	Gas Fill Gauge (replacement)
PS-45260	Lower Retainer Wrench
PS-45261	IFP Positioning / Extraction tool
PS-45262	Cylinder Head Wrench
PS-45263	Wear Band Tool
PS-45629	Arvin Shock Body Holder
PS-45280	Shock Collar Tool
PS-45821	Shock Reservoir Holder

FOX Shock Special Tools

PART NUMBER	DESCRIPTION
2871021	Shock Body Holding Tool
2871352	Shock Rod Holding Tool .50" Diameter Rod
2872429	Shock Rod Holding Tool .625" Diameter Rod
2871232	Fox Shock Spanner
2871351	Fox Shock IFP Depth Tool
PS-44925	Fox Inner Tube Puller PS 2

REAR SUSPENSION TORQUE SPECIFICATIONS

Shock Mounting Fasteners Specification

NOTE: All bolt heads should be in the left hand side.

NOTE: Torque both sides of pivot shaft if applicable

UNIT	SUSPENSION	FTS UPPER	FTS LOWER	RTS UPPER	RTS LOWER
340 LX	Edge 121	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)	25 ft-lb (34 N-m)	35 ft-lb (47 N-m)
500 XCSP					
550 LX					
SuperSport					
340 Touring	Edge 136	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)
Trail Touring					
Trail RMK	Edge RMK 136	25 ft-lb (34 N-m)	35 ft-lb (47 N-m)	25 ft-lb (34 N-m)	25 ft-lb (34 N-m)
600 IQ Switchback (Carb and CFI)	IQ Switchback	19 ft-lb (26 N-m)	35 ft-lb (47 N-m)	25 ft-lb (34 N-m)	35 ft-lb (47 N-m)
FST IQ Switchback					
FST IQ	IQ 121	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)
600 IQ (Carb and CFI)					
IQ Dragon	IQ 121 Dragon	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)	35 ft-lb (47 N-m)
600 IQ LX	M10 128	35 ft-lb (47 N-m)	45 ft-lb (61 N-m)	35 ft-lb (47 N-m)	45 ft-lb (61 N-m)
FST IQ LX					
600 IQ Touring	M10 136	35 ft-lb (47 N-m)	45 ft-lb (61 N-m)	35 ft-lb (47 N-m)	45 ft-lb (61 N-m)
FS IQ Touring					
FST IQ Touring					
FST IQ Cruiser	M10 136 ACE	35 ft-lb (47 N-m)	45 ft-lb (61 N-m)	35 ft-lb (47 N-m) (Note: This value is also for the mid shock)	35 ft-lb (47 N-m) (Note: This value is also for the mid shock)
WideTrak LX	WideTrak	25 ft-lb (34 N-m)	35 ft-lb (47 N-m)	25 ft-lb (34 N-m)	25 ft-lb (34 N-m)
600 RMK 144	IQ RMK 144	19 ft-lb (26 N-m)	35 ft-lb (47 N-m)	25 ft-lb (34 N-m)	35 ft-lb (47 N-m)
600 RMK 155	IQ RMK 155				
RMK Dragon					

Suspension to Chassis Fasteners Specification

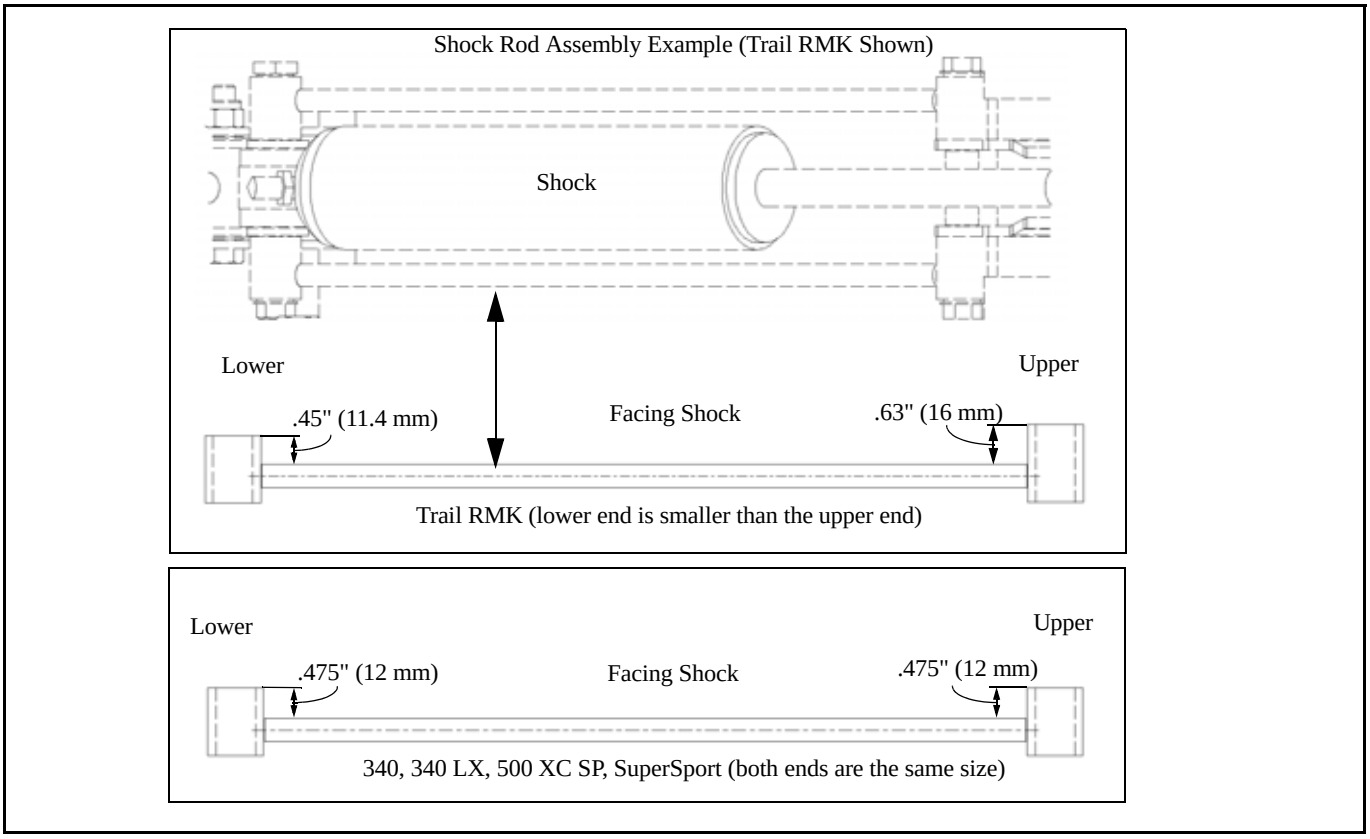
UNIT	SUSPENSION	FTA	RTA
340 LX	Edge 121	45 ft-lb (61 N-m)	45 ft-lb (61 N-m)
500 XCSP			
550 LX			
SuperSport			
340 Touring	Edge 136	45 ft-lb (61 N-m)	45 ft-lb (61 N-m)
Trail Touring			
Trail RMK	Edge RMK 136	40 ft-lb (54 N-m)	40 ft-lb (54 N-m)
600 IQ Switchback (Carb and CFI)	IQ Switchback	45 ft-lb (61 N-m)	45 ft-lb (61 N-m)
FST IQ Switchback			
FST IQ	IQ 121	60 ft-lb (81 N-m)	60 ft-lb (81 N-m)
600 IQ (Carb and CFI)			
IQ Dragon	IQ 121 Dragon	60 ft-lb (81 N-m)	60 ft-lb (81 N-m)
600 IQ LX	M10 128	70 ft-lb (95 N-m)	70 ft-lb (95 N-m)
FST IQ LX			
600 IQ Touring	M10 136	70 ft-lb (95 N-m)	70 ft-lb (95 N-m)
FS IQ Touring			
FST IQ Touring			
FST IQ Cruiser	M10 136 ACE	70 ft-lb (95 N-m)	70 ft-lb (95 N-m)
WideTrak LX (4 suspension mounting positions)	WideTrak	40 ft-lb (54 N-m)	40 ft-lb (54 N-m)
600 RMK 144	IQ RMK 144	45 ft-lb (61 N-m)	45 ft-lb (61 N-m)
600 RMK 155	IQ RMK 155		
RMK Dragon			

SHOCK CONTROL RODS

Edge Shock Rods

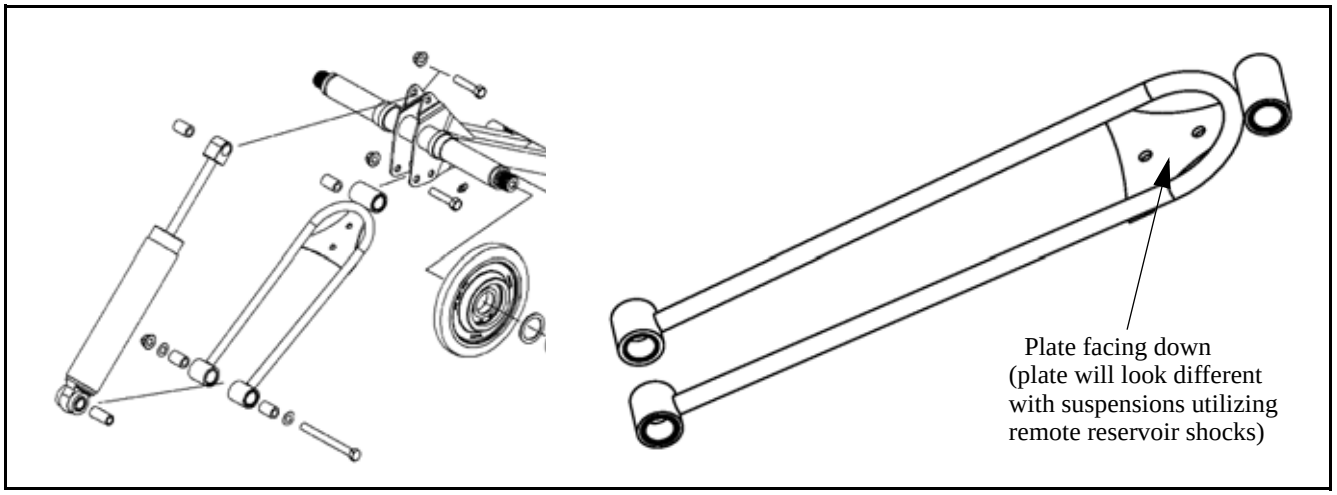
Shock rods must be installed in the same orientation as set from the factory. Any changes made to the shock rod orientation other than the factory setting may cause suspension damage.

The shock rods that are found on all 2007 Edge rear suspensions are shown below.



IQ Shock Rod

Below are examples of the IQ shock rod. The orientation of this rod is so that the plate is facing downward.



REAR SUSPENSION OPERATION

Operation

The primary function of the rear suspension is to provide a comfortable ride in all types of riding conditions. It separates the rider from the ground, while allowing for complete vehicle control. The rear suspension also must provide weight transfer and maintain track tension.

The rear suspension has many adjustable features for fine tuning to achieve optimum comfort. The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

Weight Transfer

The shifting of weight from the skis to the track is called weight transfer. As engine torque is applied to the drive axle the torque is transferred to the track, pulling it forward. This energy also tries to pull the suspension forward. The front torque arm reacts to this force by pushing down on the front of the track, in effect applying more weight to the front of the track and reducing the weight on the skis. It is important to note that energy used to lift the front of the machine is not available to push the vehicle forward.

Changing the angle of the front torque arm changes the suspension's reaction to the force. Adjusting the length of the limiter strap will change the front torque arm angle. Shortening the strap limits the extension of the front of the suspension; reducing the angle of the torque arm and increasing ski pressure during acceleration. Lengthening the strap allows the front of the suspension to extend further; increasing the angle of the torque arm and decreasing ski pressure during acceleration. Limiter strap adjustment has a great affect on weight transfer. Limiter straps only affect acceleration. It is important to check track tension whenever limiter strap length is changed.

Front track shock spring preload also affects weight transfer. A stiffer spring and/or more preload on the spring transfers more weight to the track. A softer spring and/or less preload keeps more weight on the skis. Keep your riding application in mind when choosing springs and setting spring preload. Soft springs/preload will increase ski pressure, but may bottom out. Stiff springs/preload will provide more track pressure (reduced ski pressure), but may result in a less comfortable ride

During acceleration, the rear of the suspension will compress and the IFS will extend, pivoting the machine about the front torque arm. Because of this pivoting effect, rear spring and spring preload also have some effect on weight transfer. Softer rear springs, or less preload, allow more weight transfer to the track and reduce ski pressure. Stiffer rear springs, or increased preload, allow less weight transfer to the track and increase ski pressure. The main function of the rear torque arm is to support the weight of the vehicle and rider, as well as to provide enough travel to absorb bumps and jumps.

Shock valving also has an effect on weight transfer. Refer to shock tuning information in this chapter. Scissor stops also affect weight transfer. See scissor stop information also in this chapter.

Rear Scissor blocks also have a big effect on weight transfer. See “Scissor Stop Adjustments” on page 9.8.

Suspension Coupling

On all Polaris snowmobile rear suspensions, there are two torque arms that control the movement of the rail beam. Prior to the advent of suspension coupling, these torque arms could move independently of each other. Rear suspension coupling links the movement of the front and rear torque arms to each other.

The front rear scissor stop (FRSS) couples the movement of the front torque arm with the rear torque arm and limits the amount of independence between the movement of the front torque arm and the rear torque arm.

When hitting a bump, the front torque arm starts to compress. The FRSS links that movement to the rear torque arm, causing it to compress and raise the rear suspension up as one, allowing the suspension to hit the bump only once and eliminating kickback. The factory setting are usually adequate for all riders in all conditions.

The rear rear scissor stop (RRSS) couples the movement o the rear torque arm with the front torque arm and limits the amount of independent movement between the rear torque arm and the front torque arm.

Adjusting the RRSS either allows more weight to transfer to the rear for more traction, or allows less weight to transfer to the rear, resulting in improved cornering performance. And adjustment dot is located on the RRSS. This dot ID at the higher end of the scissor stop.

Moving the RRSS to a higher position will reduce weight transfer, improve chatter bump ride and improve cornering performance.

Rear Torsion Spring Tension Adjustment

Rear spring tension adjustments are made by rotating the eccentric spring block. The block provides three spring tension positions. This adjustment is easier if the long spring leg is lifted over the roller and replaced after the block is properly positioned. Always maintain equal adjustment on both sides.

Torsion springs are much like coil springs, although shaped differently. The rate of the torsion spring is controlled by the wire diameter of the spring, and the number of coils. Pre-load is controlled by the free opening angle. See “Torsion Spring Adjustment” on page 9.9.

REAR SUSPENSION ADJUSTMENTS AND SETTINGS

Rear Suspension Adjustment Procedures

It is a good idea to have customers break the suspension in for approximately 150 miles (240 km) before fine tuning adjustments are made.

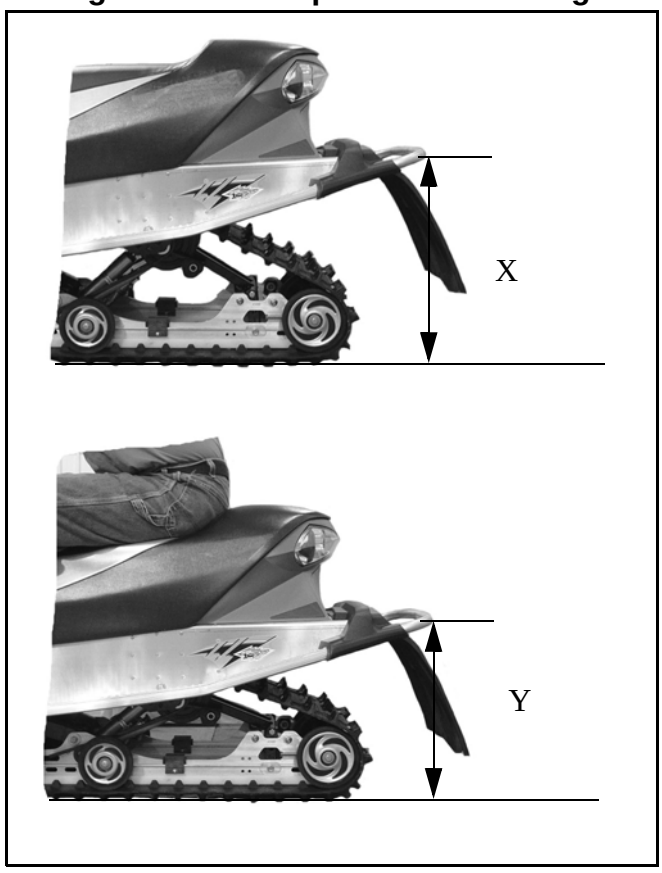
All settings will vary from rider to rider, depending on rider weight, vehicle speed, riding style, and trail conditions. We recommend starting with factory settings and then customizing each adjustment individually to suit rider preference. The machine should be methodically tested under the same conditions after each adjustment (trail and snow conditions, vehicle speed, riding position, etc.) until a satisfactory ride is achieved. Adjustments should be made to one area at a time, in order to properly evaluate the change.

The purpose of the front rear scissor stop (FRSS) is to control the bump attitude of the rear suspension. As the front torque arm (FTA) hits the bump, it forces the rear scissor to collapse a predetermined amount, depending on the FRSS block position.

This accomplishes two important things, it allows a lighter spring rate on the FTA because it can borrow spring rate from the rear torsion springs; and it prepares the rear portion of the suspension for the bump, reducing secondary kick back.

The FRSS is made of a resilient material allowing smooth action and preventing any suspension component damage.

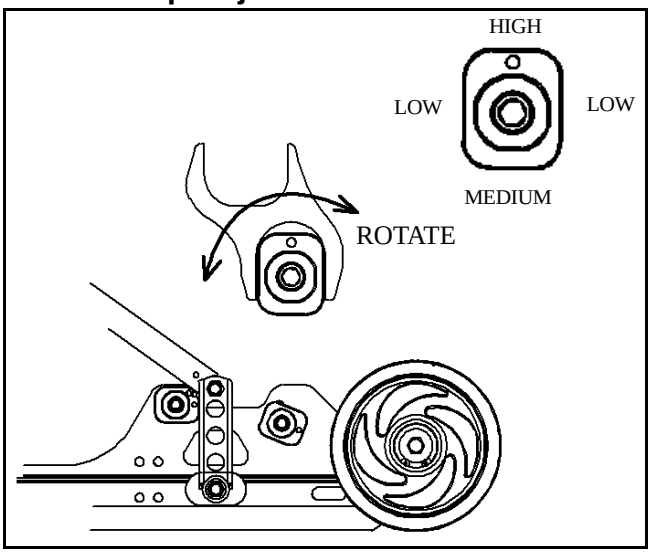
Setting the Rear Suspension Ride Height



1. To set up the rear suspension torsion spring preload, measure the distance between the ground and rear bumper with out the rider on the seat and the suspension at full extension. This can be achieved by lifting the rear of the machine so that the suspension is off the ground and carefully setting the machine down. Write this down as measurement “X”.
2. Have the rider in full gear drop down on the seat, work the suspension slightly by bouncing up and down and sit in the seated riding position. With the rider in the seated position measure from the ground to the bumper in the same spot as you did for measurement “X” and write it down as measurement “Y”.
3. To determine the correct ride height, subtract measurement X from measurement Y. (X - Y = ride height).
4. The ideal ride height is:
   - IQ 121 = 4-5” (10-13cm)
   - M-10 128/136 = 3-4” (8-10cm)
   - IQ Switchback/ IQ RMK= 5” (13cm)
   - EDGE RMK/EDGE = 4” (10cm)
   - Widetrak = 1.5” (4cm)
5. Adjust for the desired ride height by rotating the torsion spring cams located on the rear of the torsion spring.

If the rear suspension ride height can not be adjusted to the correct dimension, optional torsion springs may be required. This is only an initial setup, and final spring preload may vary based on rider preference and riding conditions.

Scissor Stop Adjustments



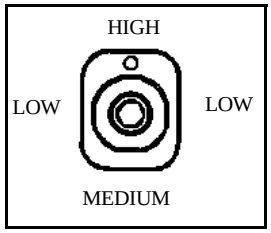
The RRSS controls weight transfer from the rear suspension to the skis. It also influences the stiffness of the ride by controlling the amount of coupling action between the front and rear torque arms. To decrease weight transfer, the RRSS should be set in the high position.

The RRSS can be totally removed for maximum weight transfer. However, unless the torsion springs and rear shock valving are

changed, the ride will be compromised. Always maintain equal adjustment on both sides.

To adjust the scissor stops place the scissor tool onto the scissor block and turn to the desired position. Ensure that the rear scissor stop face is square with the face of the scissor arm to ensure complete contact.

The dot is an indicator of the HIGH position. The sides are the LOW position and the bottom is the MEDUIUM position.

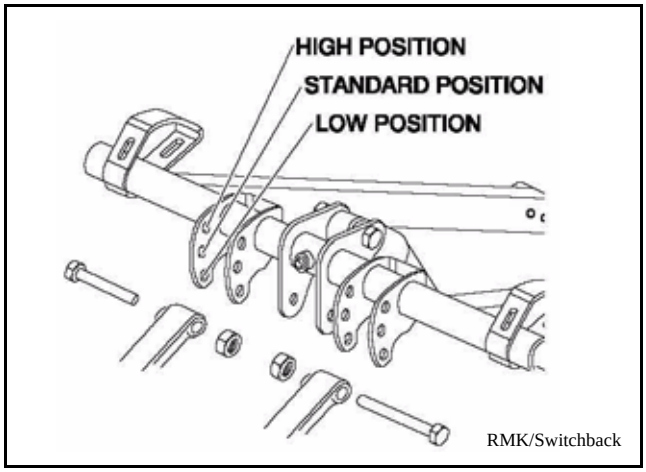


Front Torque Arm Limiter Strap Adjustment

One method of changing ski-to-snow pressure is to change the length of the front torque arm limiter straps. The limiter strap is normally mounted in the fully extended position. Both limiter straps must be adjusted evenly and remain equal in length to avoid improper Hi-Fax and track wear.

- Lengthening the straps decreases ski pressure under acceleration.
- Shortening the straps increases ski pressure under acceleration.

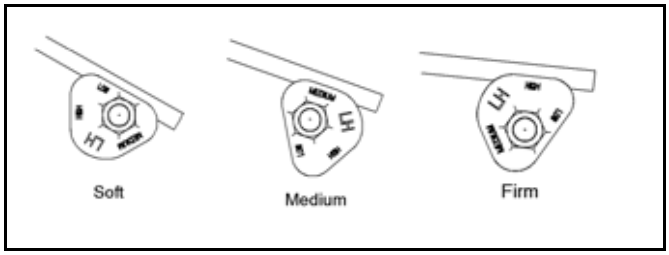
RMK/Switchback set up recommendations for optimum performance.



- DEEP POWDER SNOW:FTA in LOW position for maximum lift and flotation.
- POWDER-HARDPACK:FTA in STANDARD position for overall handling and speed over snow.
- HARDPACK: FTA in HIGH position for increased control and less transfer.

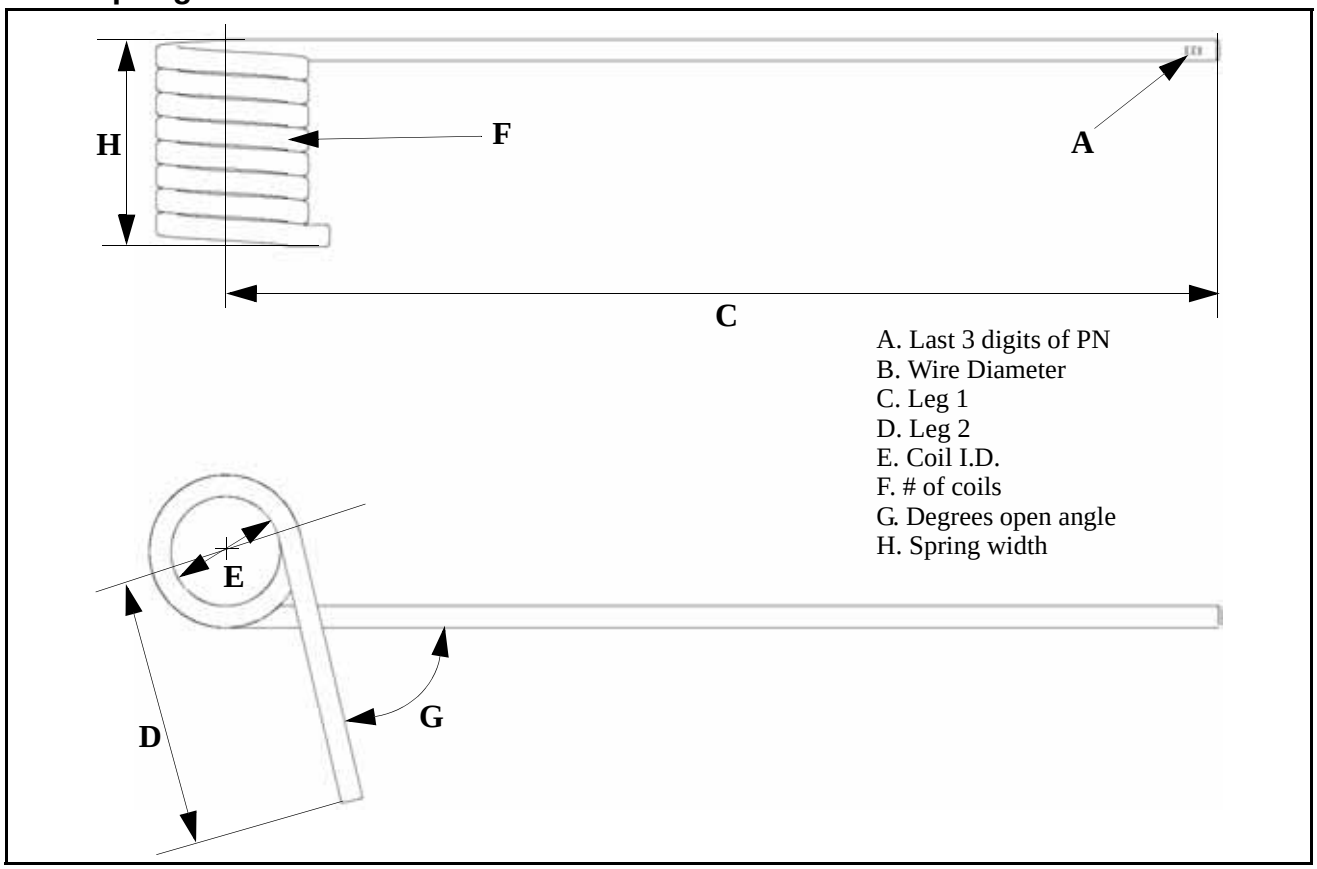
Torsion Spring Adjustment

To adjust the rear torsion spring, rotate the adjuster cam to the desired adjustment. The cam has three sides, LOW, MEDIUM and HIGH.



NOTE: It is easier to go from Low to Med to High then go directly form Low to High.

Torsion Spring Detail



The torsion spring tension is determined by the following factors.

1. Wire Diameter (B).
2. Number of coils (F).
3. Degree of the open angle (G).

Square Torsion Springs

SPRING PN (LAST 3 DIGITS (A)	WIRE DIAMETER INCHES (B)	LEG 1 INCHES (C)	LEG 2 INCHES (D)	COIL ID INCHES (E)	# OF COILS INCHES (F)	DEGREES OPEN ANGLE (G)	SPRING WIDTH INCHES (H)
7042068 LH 7042069 RH	.359	16.5	4.5	1.95-2.01	8.64	47	3.75
7041911 LH 7041912 RH	.347	16.5	4.5	1.82-1.88	7.75	90	3.49
7041627 LH 7041628 RH	.347	16.5	4.5	1.82-1.88	7.71	77	3.45
7042064 LH 7042065 RH	.359	16.5	4.5	1.95-2.01	7.63	50	3.45
7042159 LH 7042160 RH	.347	15.625	3.75	1.89-1.91	6.71	77	3.45
7041902 LH 7041903 RH	.359	16.5	4.5	1.79-1.85	7.75	90	3.5
7041629 LH 7041630 RH	.359	16.5	4.5	1.79-1.85	7.71	77	3.46

Square Torsion Springs (Continued)

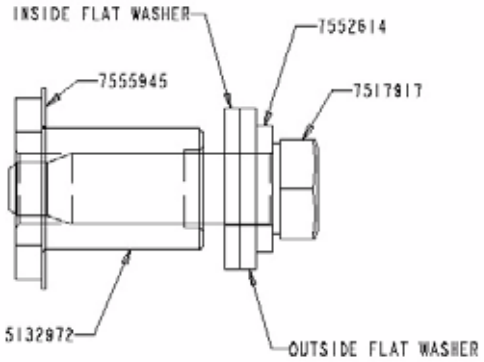
SPRING PN (LAST 3 DIGITS (A)	WIRE DIAMETER INCHES (B)	LEG 1 INCHES (C)	LEG 2 INCHES (D)	COIL ID INCHES (E)	# OF COILS INCHES (F)	DEGREES OPEN ANGLE (G)	SPRING WIDTH INCHES (H)
7041856 LH 7041857 RH	.359	16.5	4.5	1.79-1.85	7.71	85	3.46
7042079 LH 7042080 RH	.375	16.5	4.5	1.98	8.64	47	3.94
7042101 LH 7042102 RH	.347	15.625	3.75	1.69-1.71	6.71	77	3.45
7042139 LH 7042140 RH	.375	17.7	4	2.35	6.71	77	3.1
7042157 LH 7042158 RH	.359	15.625	3.75	1.82-1.84	6.71	77	3.46
7041631 LH 7041632 RH	.375	16.5	4.5	1.86-1.92	7.71	77	3.74
7041942 LH 7041943 RH	.375	16.5	4.5	2.225	6.71	77	3.52
7041895 LH 7041896 RH	.375	16.5	4.5	2.225	6.71	90	3.52
7042240 LH 7042241 RH	.405	17.7	4	2.35	6.71	77	3.25
7041655 LH 7041656 RH	.405	16.5	4.5	1.86-1.92	7.71	77	4
7041897 LH 7041898 RH	.405	16.5	4.5	2.225	6.75	90	3.55
7041940 LH 7041941 RH	.405	16.5	4.5	2.232	6.71	77	3.55
7043070 LH 7043071 RH	.347	14.75	4.5	1.80-1.84	6.72	80	3.20
7042157 LH 7042158 RH	.359	15.625	3.75	1.82-1.84	6.71	77	3.46
7042242 LH 7042243 RH	.359	17.70	3.25	2.35	6.71	77	3.1
7042253 LH 7042254 RH	.359	14.63	4.5	1.88-1.90	6.75	90	3.00
7042282 LH 7042283 RH	.421	17.70	4	2.45	6.71	71	3.4
7042321 LH 7042322 RH	.347	13.63	4.5	2.16-2.20	5.72	80	2.54
7043042 LH 7043043 RH	.347	14.75	4.5	1.80-1.82	6.72	80	3.2
7043079 LH 7043080 RH	.359	14.75	4.5	1.80-1.84	6.72	80	3.1
7043124 LH 7043125 RH	.405	17.70	4	2.35	6.71	77	3.44
7043128 LH 7043129 RH	.405	14.75	4.5	2.5	6.72	80	3.40
7043130 RH 7043131 LH	.359	14.75	4.5	2.5	5.72	80	3.75

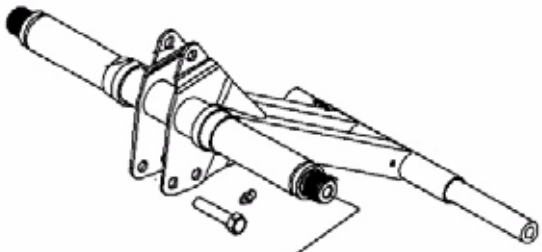
Installing Heaviest Springs On A IQ 121" Suspension

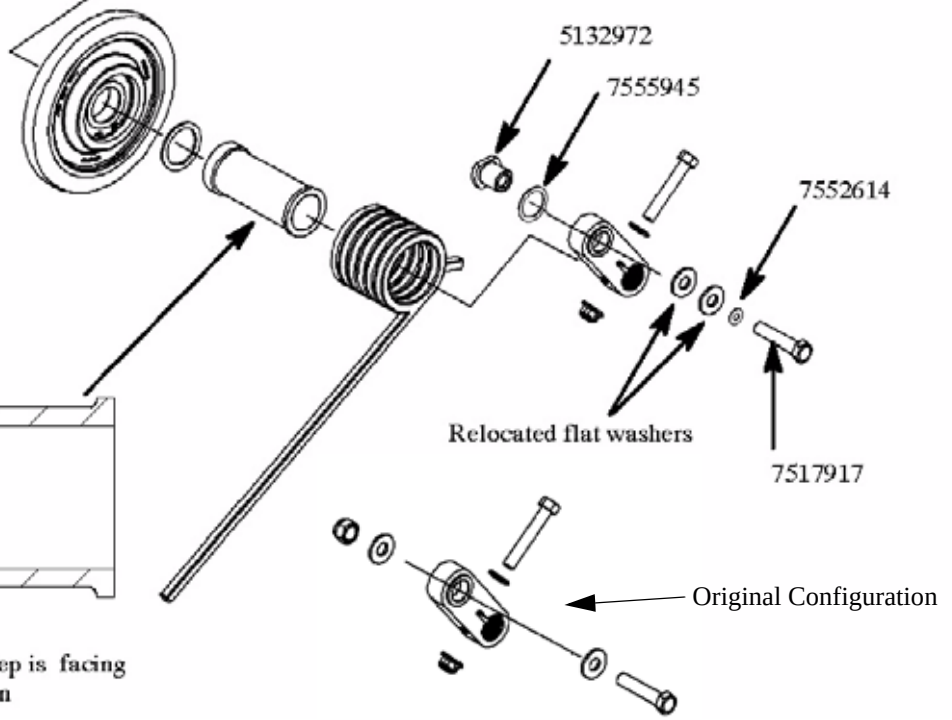
Please reference the following information when installing heavy torsion springs (7043128/7043129) on sleds equipped with IQ 121" suspensions. The issue that arises when installing the heavy spring is that the coil stack of the torsion spring is tall enough to interfere with the suspension arm clamp nut. To work around this issue you will need to order two (one for each side) of the Parts below. You will also need to relocate the two washers that are next to the clamp nut to the outside of the link arm.

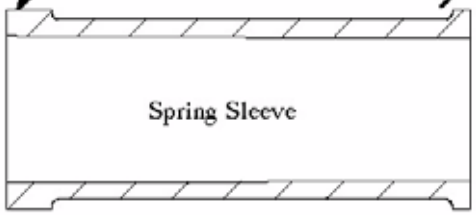
Parts Needed:

QUANT.	DESCRIPTION	PART NUMBER
2	SHAFT ARM	5132972
2	SCREW	7517917
2	THRUST WASHER	7555945
2	LOCK WASHER	7552614





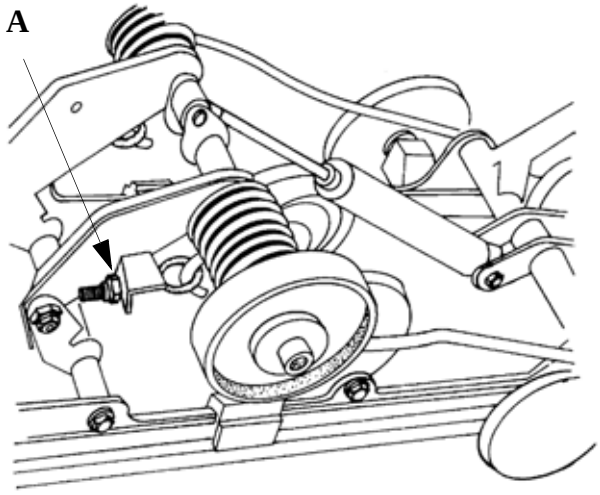




Torsion spring sleeve
NOTE: Install so that the larger step is facing toward the center of the suspension

Widetrak Torsion Spring Adjustments

Rear spring adjustment is primarily a control for riding comfort. To check for the recommended settings:

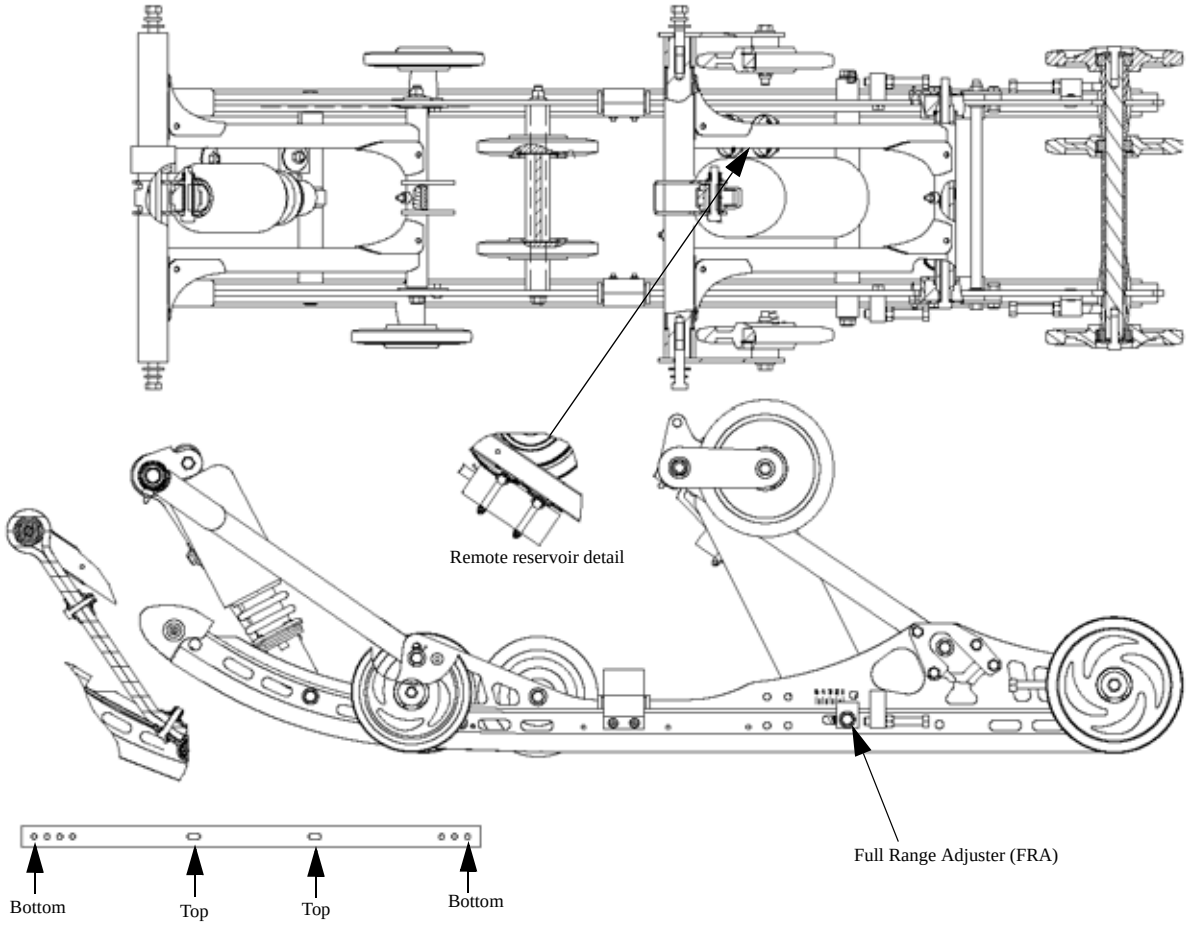


1. Lift the rear of the machine to relieve the rear springs.
2. Slowly lower the machine and measure the distance between the ground and the running board.
3. Without letting the suspension settle, the rider should carefully mount the snowmobile.
4. Measure the distance between the ground and the same spot on the running board. The difference between the two readings should be approximately 1 1/2" (3.8 cm). If the difference is greater than 1 1/2" the rear spring should be adjusted equally on both sides until the desired 1 1/2" drop is obtained.

Compensating adjustments for heavy or light drivers or cargo loads can be made by adjusting the rear spring eye bolt (A) length. Adjust spring tension so there is equal tension on the long leg of each spring.

NOTE: Rear spring settings will affect ski-to-ground pressure. If ski pressure is too light it may be desirable to tighten the rear springs for an increase in ski-to-ground pressure.

M-10 SUSPENSION



M-10 Overview

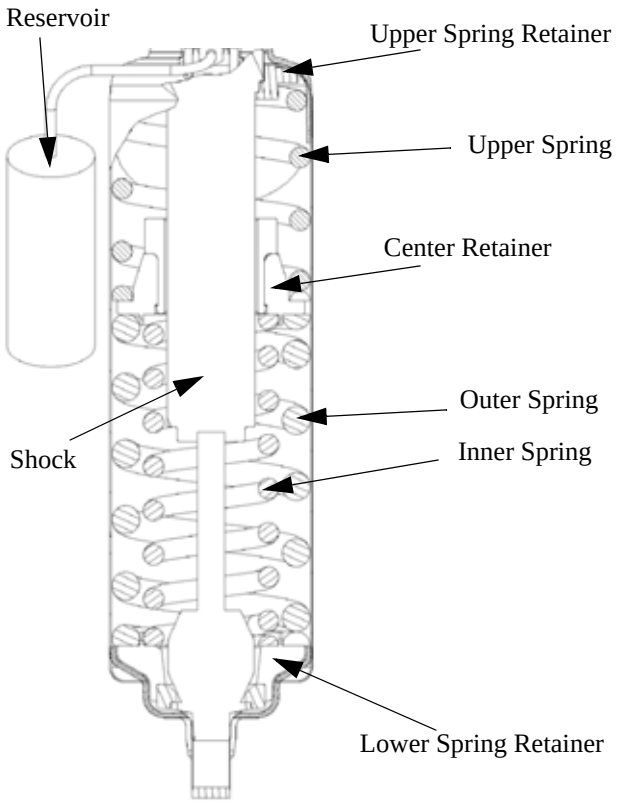
The FAST M-10 rear suspension has been designed and set up to deliver a soft ride under average riding conditions. Rider weight, riding styles, trail conditions, and vehicle speed each affect suspension action.

The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

M-10 RTS Adjustments

- Full Range Adjuster (FRA)
- Center Retainer

IMPORTANT: The M-10 rear suspension has been designed to be very sensitive to rider weight. Changes in rider weight of 25 lbs. or more may require appropriate changes in FRA settings.



M-10 Terminology

- **Couple Blocks:** Plastic blocks located at the rear of each rail. Blocks facilitate the couple function.
- **Full Range Adjuster (FRA):** FRA refers to the adjustable lower rear shock attachments. Changing the FRA location has two effects on tuning. First, moving the shock forward increases shock speed, resulting in firmer damping on compression and rebound. Second, it also increases the effect of the rear spring by displacing it further.
- **Sag Settings:** The difference in rear bumper height from the sleds fully extended position to its lower height with the rider seated on the sled.

M-10 Adjustments

The primary adjustment on the M-10 suspension is the Full Range Adjustment (FRA). Adjusting the FRA will have to MOST effect on rear suspension performance.

Polaris recommends that you allow between 25 to 200 miles for the suspension to break in before performing any adjustments to the suspension.

This chart is a guideline to be used for initial suspension setups. Your setup may vary based on your desired riding style.

M-10 128

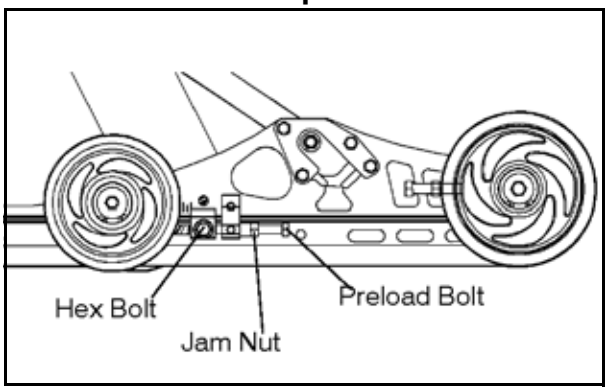
Rider weight with gear (lbs.)	Suggested FRA Range (Lower number is softer)
Under 100	1 to 1 1/2
100-150	1 1/2 to 2
150-200	2 to 2 1/2
200-250	2 1/2 to 3
250-300	3 to 3 1/2
300-350*	3 1/2 to 4
Over 350*	4 to 5

M-10 136

Rider weight with gear (lbs.)	Suggested FRA Range (Lower number is softer)
Under 100*	1 to 1 1/2
100-150*	1 1/2 to 2
150-200*	2 to 2 1/2
200-250	2 1/2 to 3
250-300	3 to 3 1/2
300-350	3 1/2 to 4
Over 350	4 to 5

*=You may prefer an optional rear track middle spring retainer. See “Optional Retainers” on page 9.16.

M-10 FRA Initial Set Up Reference



The FRA setting is the primary rear suspension adjustment. It will have the MOST effect on the rear suspension performance. To adjust the FRA:.

1. Refer to the initial set-up reference chart to determine the desired FRA position.
2. To adjust, loosen the hex bolts attaching the rear lower shock cross shaft to the rail beam.
3. Using a 9/16" wrench, loosen the jam nuts on the preload bolts.
4. Adjust the preload bolts to the desired FRA position.
5. Tighten the jam nuts.

NOTE: Make sure the preload bolt contacts the slide block before tightening the jam nut.

6. Tighten the hex bolts and torque to 35 ft. lbs. (47 N-m)

NOTE: When the M-10 suspension is new, it will take from 25 to 200 miles (40-300 km) to properly break in the springs and shocks, at which time the suspension will be softer and may require FRA re-adjustment.

M-10 Rear Spring Preload

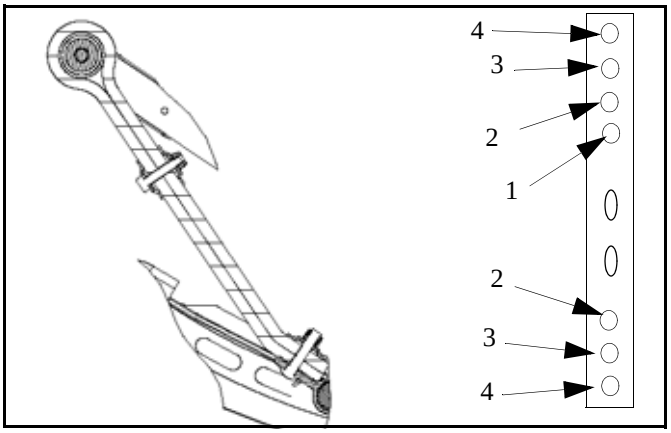
If FRA position alone does not allow the setup of the proper amount of sag, the center retainer of the rear track shock can be replaced with optional retainers to adjust the preload and change the sag.

Optional Retainers

Retainer insert Part Number	Retainer part Number	Preload	Sag
5436109	5135077 (std. on M10/128)	Least	Most
	5134923	Middle	Middle
	5135080 (std. on M10/136)	Most	Least

NOTE: Whenever ordering any of the retainers listed in the chart, always order the retainer insert as well. The insert is not removable once installed, so a new insert is needed when installing a new retainer.

M-10 Ski Pressure

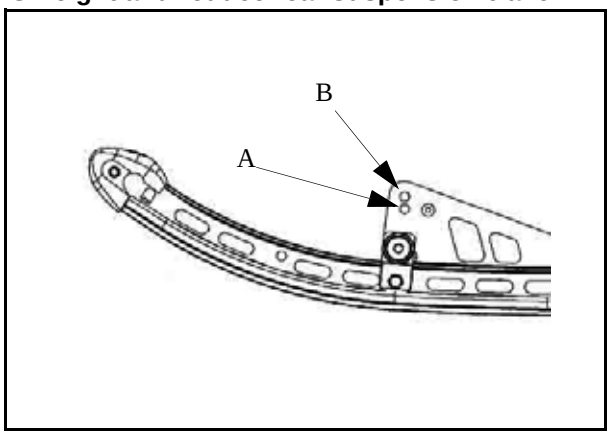


Ski pressure is set at the factory to deliver the optimum balance between ride and handling. If a rider prefers more ski pressure for improved steering performance, adjustments can be made to the front limiter strap and front arm mount.

1. Determine if the rider prefers comfort or control. Lean toward the #4 setting for comfort and toward the #3 setting for aggressive riding.
2. For full hole adjustments, remove the 5/16" nut and flat washers from the lower attachments of the limiter straps and relocate the straps to the desired position (i.e. move from position 4 to 3). Replace the nut and washer. Tighten securely.
3. For half-hole increments (such as hole 3 or 4), the limiter straps have slots at the upper pinch bolt. These slots allow the bolts to be loosened (rather than removed) for half-step adjustments. Re-tighten the pinch bolts.
4. There are also two front arm mounting holes in the slide rail that can adjust ski pressure. The lower hole (A) increases

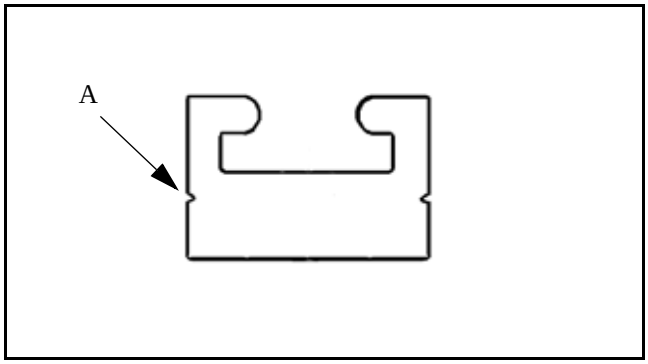
ski pressure while the upper hole (B) decreases ski pressure.

NOTE: By design, the BIASED COUPLE design of the M-10 suspension displaces the rear arm as the front arm is compressed. This means that when you raise the front limiter strap, at some point you will collapse the rear suspension arm, which will affect SAG height and reduce rear suspension travel.



RAIL SLIDER

Rail Slide Wear Limit



Hi-Fax replacement on all Polaris models is similar. When any area of the Hi-Fax is worn to the wear indicator (A), it should be replaced. This will save wear on other vital components on the suspension.

The slide rail is designed to operate in conditions with adequate snow cover to provide sufficient lubrication. Excessive wear may be due to improper alignment, improper track adjustment or machine operation on surfaces without snow.

Rail Slide Removal

1. Remove the rear suspension.

NOTE: Some models may allow the rail sliders to be removed by sliding it through track windows with the suspension mounted in the machine.

2. Remove front rail slider retaining bolt, located at the rail tip.
3. Use a block of wood or a drift punch and hammer to drive the Hi-Fax rearward off the slide rail.
4. With the rail slider at room temperature, install a new rail slider by reversing steps 1 - 3.

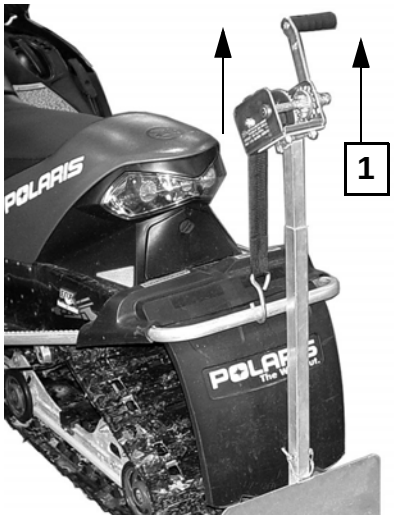
NOTE: Lightly coat rail slider track clip area with a lubricant such as LPS2 or WD-40 to ease installation.

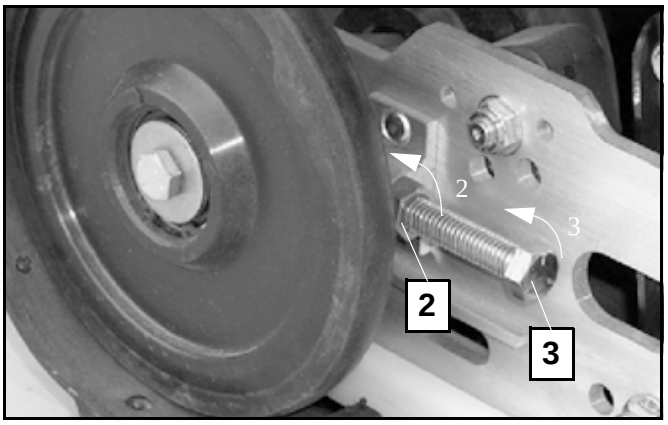
Rail Slider Break In

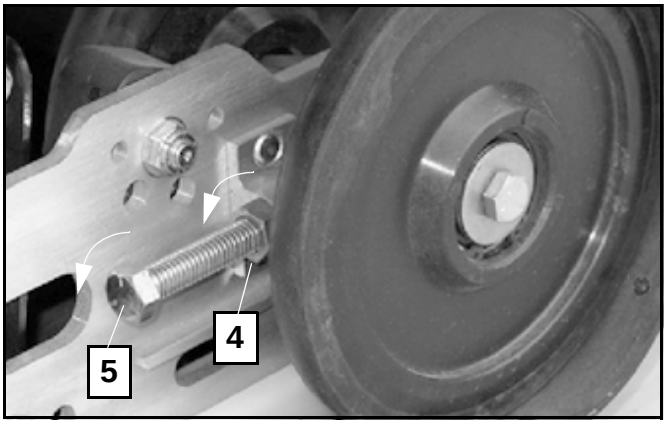
After installing new rail sliders they must be “broke in” for longer life and better wear patterns. When performing the breaking in procedure ride the sled on a surface that has adequate snow conditions with deeper snow nearby. Run the sled on the adequate snow surface and dip into the deeper snow every so often.

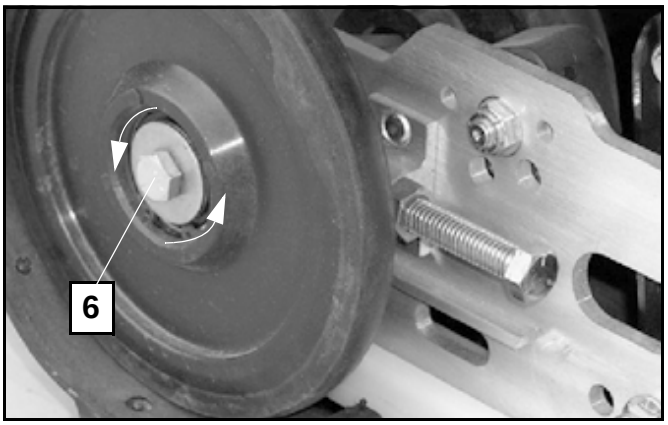
REAR SUSPENSION REMOVAL / INSTALLATION

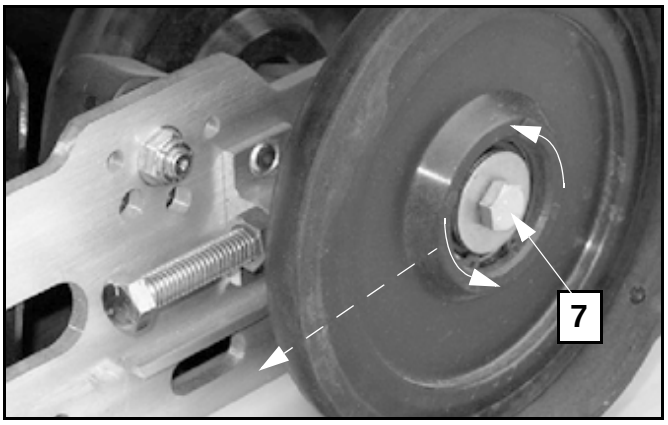
Rear Suspension Removal

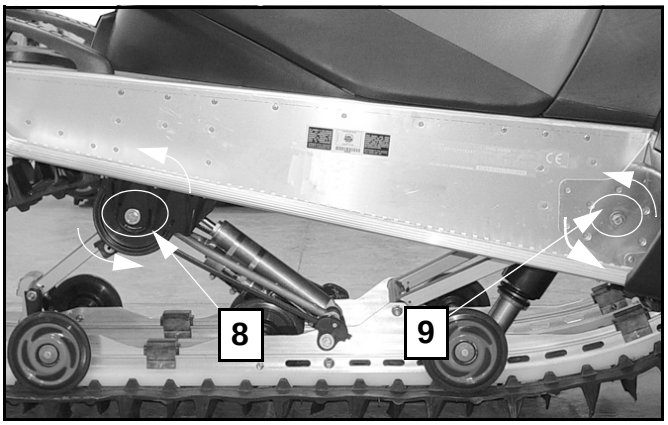


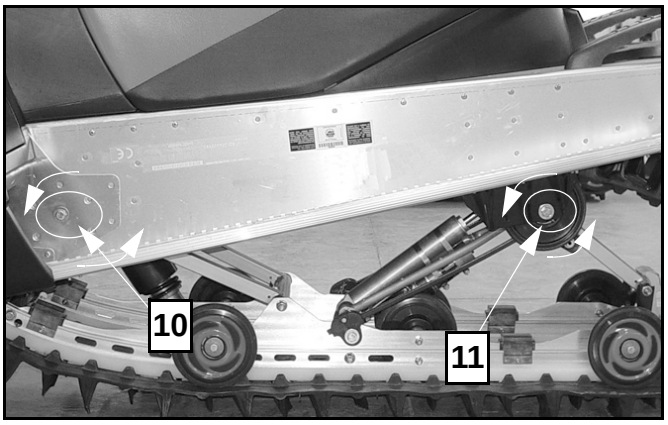


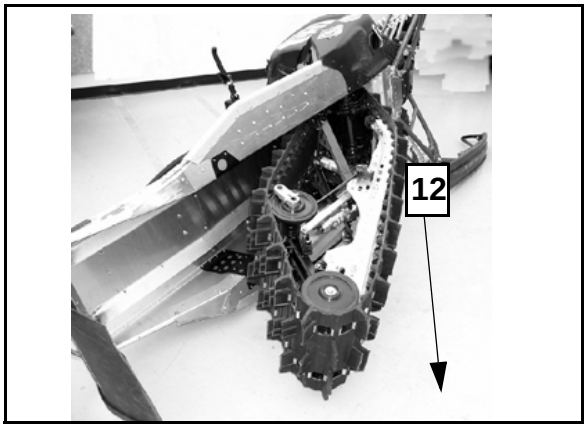




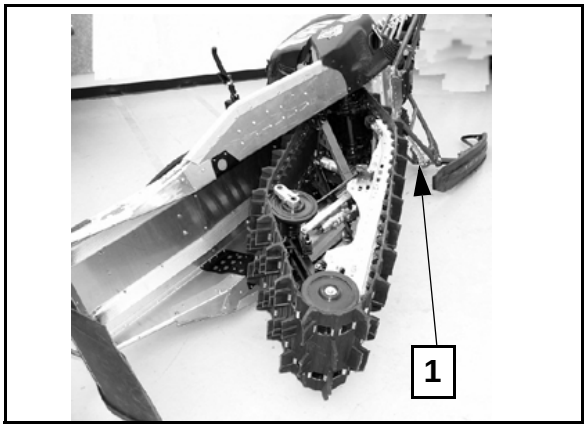


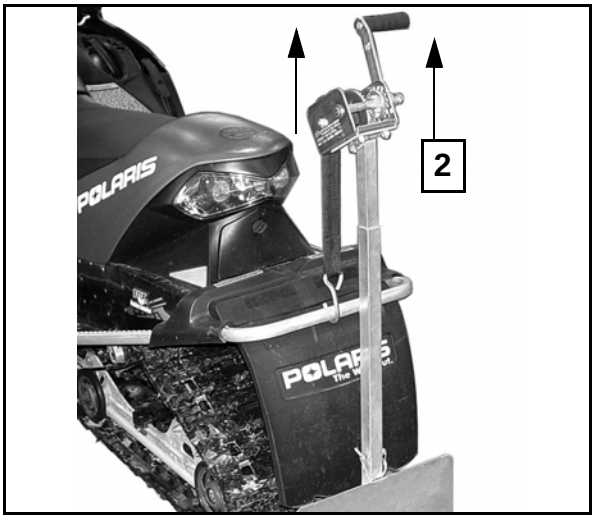


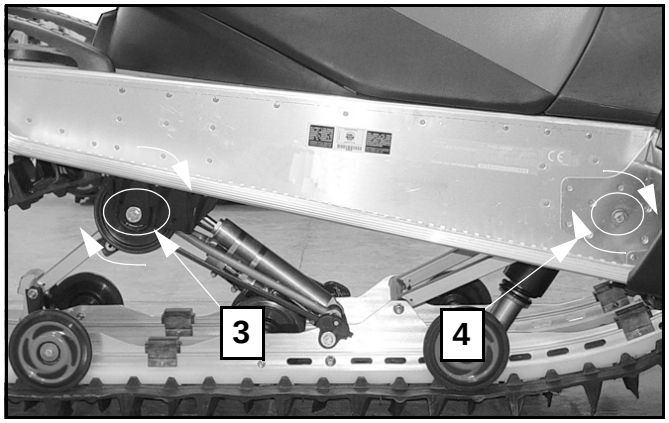




Rear Suspension Installation

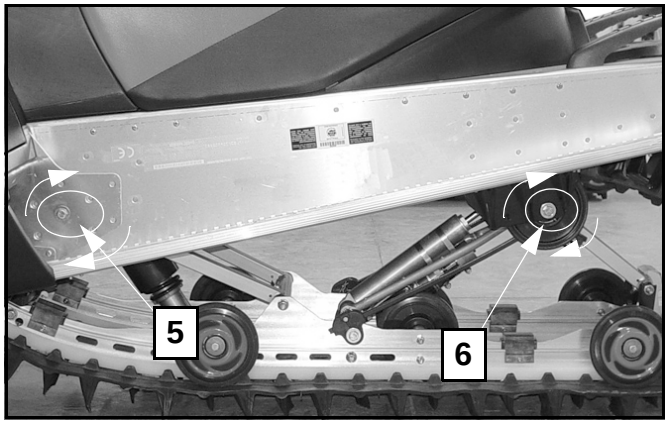






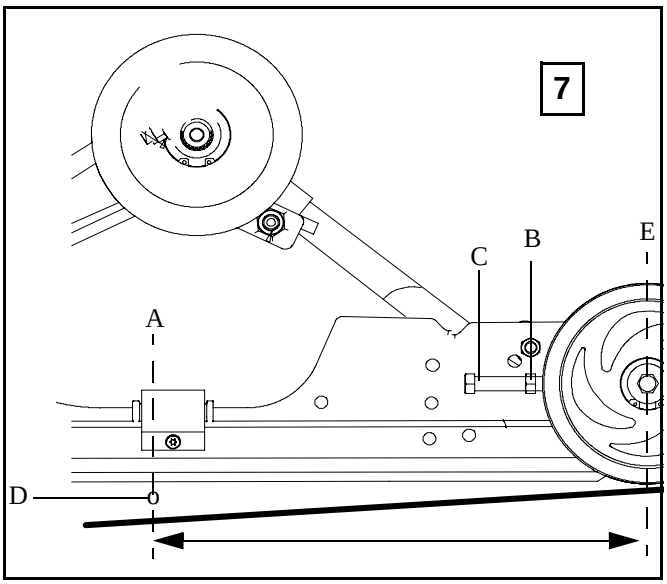
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See “Suspension to Chassis Fasteners Specification” on page 9.5.



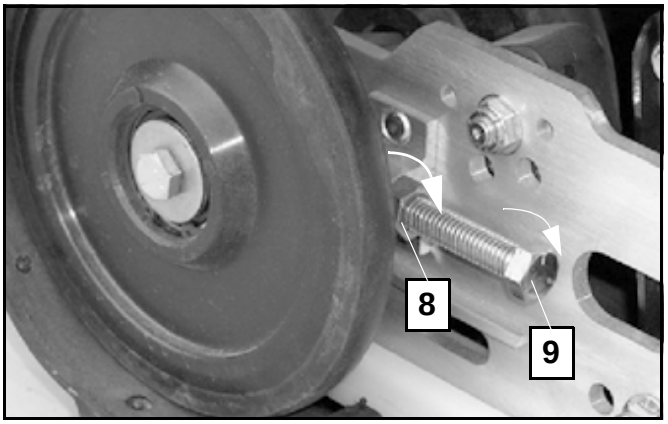
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See “Suspension to Chassis Fasteners Specification” on page 9.5.



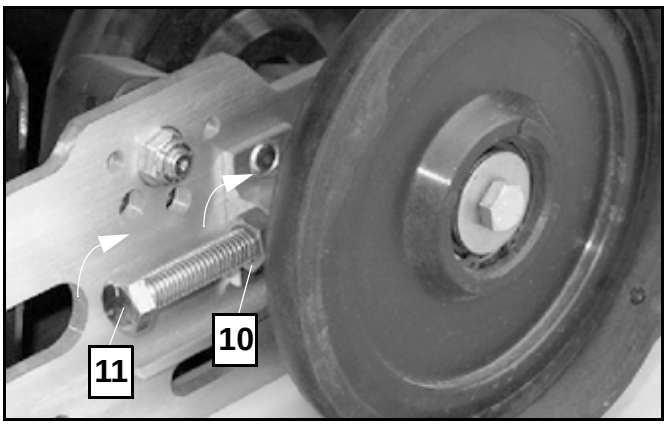
= In. / mm.

See “Track Tension” on page 3.21.



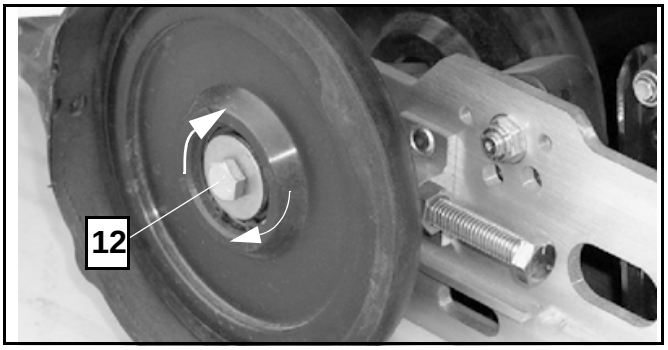
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35 ft-lbs (48 N-m)



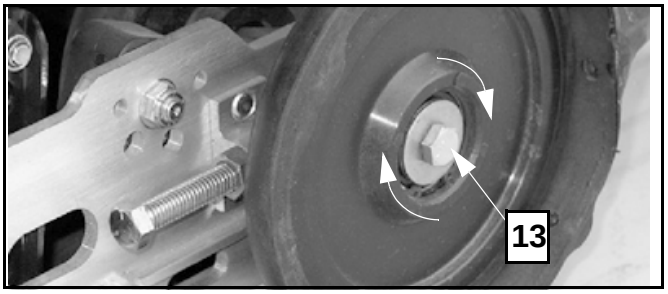
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35 ft-lbs (48 N-m)



= T

35 ft-lbs (48 N-m)



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35 ft-lbs (48 N-m)

SHOCK INFORMATION

Serviceable Shocks

Extended length is measured form center to center of the mounting holes on the eyelets.

Front Track Shocks

SHOCK PN	BRAND	EXTENDED LENGTH IN (MM)	COLLAPSED LENGTH IN (MM)	STROKE IN (MM)	SHOCK ROD IN (MM)	IFP DEPTH IN (MM)	SHAFT PN	PSI
7041975	Arvin	12.10 (307.3)	8.60 (218.4)	3.5 (89)	.50 (12.7)	4.61 (117)t	1700026	200
7043142	Fox	12.51 (317.8)	8.92 (226.6)	3.59 (91.2)	.50 (12.7)	.840 (21.3)b	1500713	200
7043244	Arvin	12.12 (307.9)	8.61 (218.6)	3.52 (89.3)	.50 (12.7)	4.68 (118.9)t	1700026	200
7043267	Fox	12.07 (306.6)	8.63 (219.2)	3.44 (87.4)	.50 (12.7)	1.8 (45.7)b	1500778	200
7043204	Walker	12.10 (307.3)	8.60 (218.4)	3.50 (89)	.625 (15.9)	2.25 (57.2)	1800316	200
7043234	Walker	12.49 (317.2)	8.92 (226.6)	3.57 (90.7)	1.124 (28.5)	N/A	1800228	215

Rear Track Shocks

SHOCK PN	BRAND	EXTENDED LENGTH IN (MM)	COLLAPSED LENGTH IN (MM)	STROKE IN (MM)	SHOCK ROD IN (MM)	IFP DEPTH IN (MM)	SHAFT PN	PSI
7043177	Fox	15.60 (396.2)	10.56 (262.2)	5.04 (128)	.50 (12.7)	1.22 (31) b	1500599	200
7043246	Fox	16.60 (421.6)	10.91 (277.1)	5.96 (151.4)	.50 (12.7)	2.23 (56.6)rr	1500715	200
7043266	Fox	15.65 (397.5)	10.56 (262.2)	5.09 (129.3)	.50 (12.7)	1.63 (41.4)rr	1500779	200
7043205	Walker	15.60 (396.2)	10.56 (262.2)	5.04 (128)	.625 (15.9)	2.25 (57.2)	1800228	200
7043216	Fox	14.12 (358.6)	9.29 (235.9)	4.83 (122.6)	.50 (12.7)	2.40 (61) rr	1500562	300
7043235	Walker	16.71 (424.4)	10.96 (278.4)	5.75 (146.1)	.50 (12.7)	7.25 (184.2) t	1800296	200

b=IFP depth measured form the bottom of the shock body

t=IFP depth measured form the top of the shock body.

rr=top of remote reservoir

Rear Suspension Front Track Shock (FTS) Stock Valving

SHOCK PN	7041975	7043142	7043244	7043267	7043204	7043234
COMPRESSION	.800x.008 .900x.008 1.000x.008 1.100x.010 1.300x.008 1.000x.006 1.300x.008	1.125x.093 .700x.012 .700x.012 .900x.008 1.100x.008 1.250x.008 .900x.008 1.250x.008 1.300x.006	.800x.008 .900x.010 1.000x.010 1.100x.008 1.250x.008 .900x.008 1.100x.006 1.300x.008	1.125x.093 .700x.012 .700x.008 .800x.008 .900x.008 1.100x.008 1.250x.008 1.300x.010	.625x.065 .700x.012 .800x.012 .900x.012 1.000x.012 1.100x.012 1.200x.012 1.300x.012	1.300x.025 .875x.090 1.300x.025 1.300x.025 .700x.010 .800x.010 .900x.015 1.000x.015 1.100x.015 1.200x.015 1.250x.015 1.300x.015 1.300x.015
Piston Orifice	.070	.78	.070	.070	.082	.052
REBOUND	1.250x.008 1.100x.010 1.000x.010 .900x.012 .800x.012	1.250x.008 .800x.008 1.100x.010 1.000x.010 .900x.012 .900x.012 .800x.015 .700x.015 .620x.093	1.250x.010 1.100x.010 1.000x.010 .900x.010 .800x.012 .700x.010	1.250x.008 .800x.006 1.100x.010 1.000x.010 .900x.012 .800x.015 .800x.015 .700x.015 .620x.093	1.200x.012 1.100x.012 1.000x.012 .900x.012 .800x.012 .700x.012 .625x.065	1.250x.015 1.200x.015 1.100x.015 1.000x.015 .900x.015 .800x.015 .700x.015 .625x.065
ADJUSTER	N/A	N/A	N/A	N/A	1.100x.012 1.000x.012 1.000x.012 .700x.010 .875x.090	N/A

Rear Suspension Rear Track Shock (RTS)
Stock Valving

SHOCK PN	7043177	7043246	7043266	7043205	7043216	7043235
COMPRESSION	1.125x.093 .900x.010 1.000x.010 1.100x.012 1.100x.010 1.100.008 1.000x.006 1.300x.008 1.300x.008	1.125x.093 .700x.015 .700x.015 .700x.015 1.000x.010 1.100x.012 1.250x.012 .800x.008 1.250x.008 1.300x.008	.700x.015 .700x.015 .700x.015 .900x.010 1.000x.008 1.100x.008 1.250x.010 .900x.010 1.250x.008 1.300x.006	.875x.090 .625x.065 .700x.008 .800x.008 .900x.010 1.000x.010 1.100x.008 .900x.008 1.100x.008 .700x.010 1.250x.010 1.300x.010	1.125x.093 .900x.008 1.300x.008 1.300x.008 1.300x.010 .800x.010 1.300x.006 1.300x.008	.625x.065 .700x.010 .800x.010 .900x.010 1.000x.010 1.100x.010 1.250x.012
Piston Orifice	.093	.070	.076	.082	.055	.040
REBOUND	1.250x.010 1.250x.010 1.100x.012 1.000x.012 .900x.012 .800x.012 .620x.093	1.250x.008 .700x.006 1.100x.015 1.100x.015 .900x.008 .950x.050 .950x.050	1.250x.008 .700x.008 1.100x.012 1.000x.010 .900x.008 .800x.008 .950x.050 .950x.050	1.250x.012 .800x.008 1.100x.010 1.000x.010 .900x.010 .800x.010 .700x.010 .625x.065	1.250x.012 1.100x.010 1.125x.093 .620x.093	1.300x.010 1.250x.010 1.100x.008 1.100x.008 1.000x.010 .900x.010 .800x.008 .700x.010 .875x.090
ADJUSTER		Piston Assy		1.100x.025 1.000x.015 1.100x.015 .700x.010 .875x.090		

SHOCK VALVE PART NUMBERS

Shock valves are used in a stack on the top and on the bottom of the shock piston. These stacks can be adjusted so that it can control the amount of fluid that is forced by as the piston travels through its motion. Below is a chart that has the part numbers of these valves, proceeding the part number is the size of the washer (out side diameter x thickness). A thick washer (.700 x .010) will try to keep the fluid from passing through the piston as it travels.

Refer to the appropriate parts manual for a complete listing of shock parts.

Ryde FX™ Shock Valve Part Numbers

NOTE: ***The cart below groups the valves by thickness***

PART NUMBER	SIZE	THICKNESS
1700080	0.700	0.004
1700086	0.800	
1700092	0.900	
1700081	0.700	0.006
1700087	0.800	
1700093	0.900	
1700121	1.000	
1700129	1.100	
1700134	1.250	
1700139	1.300	
1700094	0.900	0.008
1700122	1.000	
1700130	1.100	
1700135	1.250	
1700140	1.300	
1700082	0.700	0.009
1700088	0.800	
1700083	0.700	0.010
1700089	0.800	
1700095	0.900	
1700126	1.000	
1700131	1.100	
1700136	1.250	
1700141	1.300	
1700084	0.700	0.012
1700090	0.800	
1700096	0.900	
1700127	1.000	
1700132	1.100	
1700137	1.250	
1700142	1.300	
1700085	0.700	0.015
1700091	0.800	
1700120	0.900	
1700128	1.000	
1700133	1.100	
1700138	1.250	
1700143	1.300	

Fox™ Shock Valve Part Numbers

NOTE: ***The cart below groups the valves by thickness***

PART NUMBER	SIZE	THICKNESS
1500055	0.700	0.006
1500054	0.800	
1500053	0.900	
1500048	1.000	
1500049	1.100	
1500050	1.250	
1500052	1.300	
1500029	0.700	0.008
1500028	0.800	
1500033	0.900	
1500032	1.000	
1500031	1.100	
1500051	1.250	
1500030	1.300	
1500044	0.700	0.010
1500047	0.800	
1500046	0.900	
1500045	1.000	
1500027	1.100	
1500026	1.250	
1500062	1.300	
1500056	0.700	0.012
1500057	0.800	
1500058	0.900	
1500059	1.000	
1500060	1.100	
1500078	1.250	
1500079	1.300	
1500081	0.700	0.015
1500082	0.800	
1500083	0.900	
1500084	1.000	
1500085	1.100	
1500086	1.250	
1500087	1.300	

Walker Evans Shock Valve Part Numbers

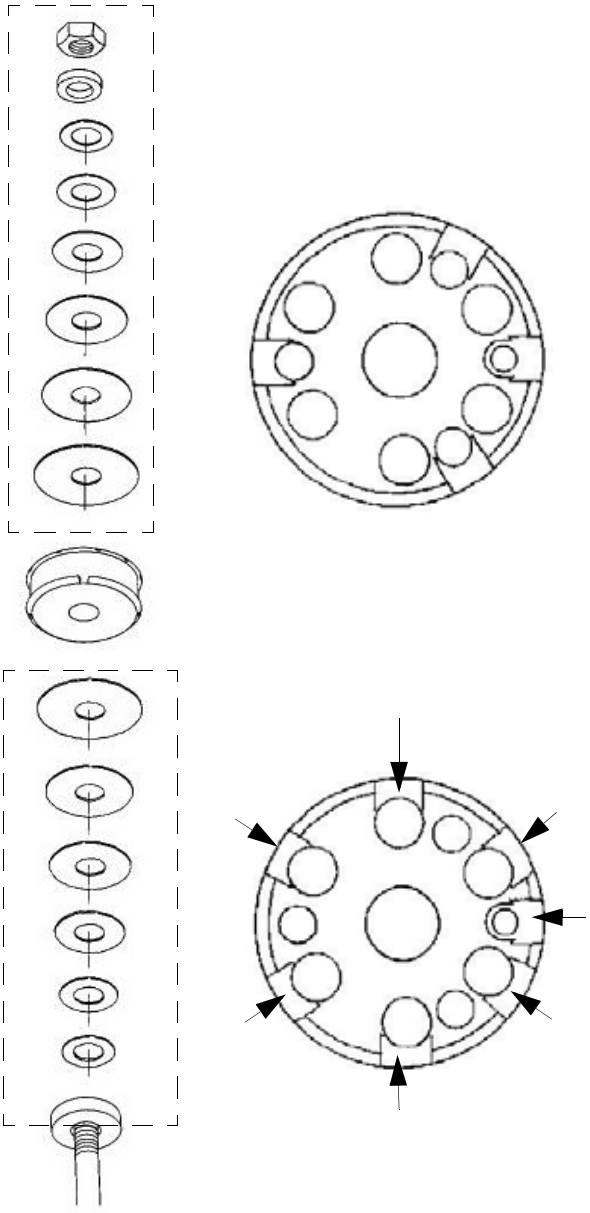
PART NUMBER	SIZE	THICKNESS
1800051	.700	.006
1800075	.800	
1800076	.900	
1800077	1.000	
1800078	1.100	
1800079	1.200	
1800080	1.300	
1800081	.700	.008
1800082	.800	
1800083	.900	
1800084	1.000	
1800085	1.100	
1800086	1.200	
1800087	1.250	
1800088	1.300	
1800052	.700	.010
1800053	.800	
1800054	.900	
1800055	1.000	
1800056	1.100	
1800057	1.200	
1800058	1.300	
1800059	.700	.012
1800060	.800	
1800061	.900	
1800062	1.000	
1800063	1.100	
1800064	1.200	
1800089	1.250	
1800072	1.300	
1800066	.700	.015
1800067	.800	
1800068	.900	
1800069	1.000	
1800070	1.100	
1800071	1.250	
1800072	1.300	
1800090	1.000	.025
1800091	1.100	
1800092	1.200	
1800093	1.300	
1800050	.625	.065
1800204	.875	.090

Shock Valving Arrangement

Shown below is an example of how valving stacks are arranged. The Production Shock Information contain production valving specifications and piston orifice sizes.

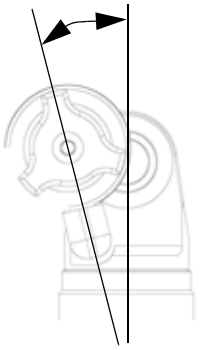
Parts in the box below are an example of standard valving.

NOTE: Note the direction of the valve piston before disassembly. The side with the greater number of relief slots (1) should face the nut end (2) of the shaft.



REAR SHOCK SPECIFICATIONS

Walker Evans FTS 7043204

ITEM	NOTE
Extended Length	12.10" (30.7 cm)
Collapsed Length	8.60" (21.8 cm)
Stroke	3.50" (8.9 cm)
Shock Rod	.625" (1.6 cm)
IFP Depth	2.25" (5.7 cm)
Shaft PN	1800316
PSI	200
Spring	7043147
Spring Ratio	130/270
Free Length	8.22" (20.9 cm)
Hose length	9.13" ±.13" (23.2 cm ±3.3mm)
Fluid	5w
Factory setting	Adjuster at 4 clicks (±1) from full counterclockwise position
Reservoir fitting angle 15° ±10° from the center line of the shock	

Fox FTS 7043267

ITEM	NOTE
Extended Length	12.07" (30.7 cm)
Collapsed Length	8.63" (21.9 cm)
Stroke	3.44" (8.7 cm)
Shock Rod	.50" (1.27 cm)
IFP Depth measured from the bottom of the shock body.	1.8" (4.57 cm)
Shaft PN	1500715
PSI	200
Eyelet	Apply Primer N and red Loctite® 271
	Torque 30 ft-lb (41 N-m)
Lower Body Cap	Apply Primer N and Green Loctite® 638
	Torque 75 ft-lb (102 N-m)
Lock Ring Torque	10 ft-lb (14 N-m)
Bearing Cap Torque	30 ft-lb (41 N-m)
Spring	7043147
Spring Ratio	130/270 lb/in
Free Length	8.22" (20.9 cm)
Spring Installed length	7.84" (19.9 cm)
Stock Clicker Setting	8 ± 1

Walker Evans FTS 7043234

ITEM	NOTE
Extended Length	12.49" (317.2mm)
Collapsed Length	8.92" (226.6mm)
Stroke	3.57" (90.7mm)
Shock Rod	1.124" (28.5mm)
IFP Depth	N/A
Shaft PN (assembly)	1800228
Pressure*	215psi/14.8 bar
Spring	N/A
Spring Ratio	N/A
Free Length	N/A
Fluid*	70 cc / 5 wt.
*= Critical specifications	

Ryde FX FTS 7043244

ITEM	NOTE
Extended Length	12.12" (307.9mm)
Collapsed Length	8.61" (3.52mm)
Stroke	3.52" (89.3mm)
Shock Rod	.50" (12.7mm)
IFP Depth	4.68" (118.9mm)
Shaft PN	1700026
Pressure	200 psi (13.8 bar)
Spring	7043147
Spring Ratio	130/270 lb/in
Free Length	8.22" (209mm)
Fluid	107cc
Spring Installed Length	7.72" (196mm)

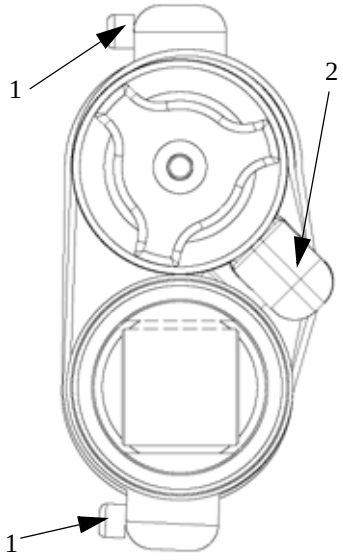
Fox FTS 7043142

ITEM	NOTE
Extended Length	12.51" (317.8mm)
Collapsed Length	8.92" (226.6mm)
Stroke	3.59" (91.2mm)
Shock Rod	.50" (12.7mm)
IFP Depth measured from the bottom of the shock body	.84" (21.3)
Shaft PN	1500713
Pressure	200psi/13.8bar
Spring	7042050
Spring Ratio	170 lb/in
Free Length	7.50" (191mm)
Fluid	Full

Ryde FX FTS 7041975

ITEM	NOTE
Extended Length	12.10" (307.3mm)
Collapsed Length	8.60" (218.4mm)
Stroke	3.5" (89mm)
Shock Rod	.50" (12.7mm)
IFP Depth from the top of the shock body	4.61" (117mm)
Shaft PN	1700026
PSI	200 psi (13.8 bar)
Spring	7041914
Spring Ratio	160 lb/in
Free Length	7.57
Fluid	102cc

Walker Evans RTS 7043205

ITEM	NOTE
Extended Length	15.60" (39.6mm)
Collapsed Length	10.56" (26.8cm)
Stroke	5.04" (12.8cm)
Shock Rod	.625" (1.59cm)
IFP Depth	2.25" (57.2mm)
Shaft PN	1800228
Pressure	200 psi (13.8 bar)
Fluid	5 wt
Hose clamp orientation (1)	
Fitting orientation (2)	
Clicker position	position 8 ± 1

Fox RTS 7043246

ITEM	NOTE
Extended Length	16.60" (421.6mm)
Collapsed Length	10.91" (277.1mm)
Stroke	5.96" (151.4mm)
Shock Rod	.50" (12.7mm)
IFP Depth	2.23" (56.6mm)
Shaft PN	1500715
Pressure	200 psi (13.8 bar)
Fluid	Premium Fox
Body Cap	Apply primer N and Green Loctite 638 Torque to75 ft-lb (102 N-m)
Shock Rod Bearing Cap	Torque to 30 ft-lb (41 N-m)
Banjo Bolt Fitting	Torque to 15 ft-lb (20 N-m)

Fox RTS 7043266

ITEM	NOTE
Extended Length	15.65" (39.75cm)
Collapsed Length	10.56" (26.2cm)
Stroke	5.09" (12.9cm)
Shock Rod	.50" (1.27cm)
IFP Depth	1.63" (4.1cm)
Shaft PN	1500779
PSI	200 psi (13.8 bar)
Body Cap	Apply primer N and Green Loctite 638 Torque to75 ft-lb (102 N-m)
Rod Eyelet	Apply primer N and Red Loctite 277 Torque to 30 ft-lb (41 N-m)
Banjo Bolt	Torque to 15 ft-lb (20 N-m)

Fox RTS 7043177

ITEM	NOTE
Extended Length	15.60" (39.6 cm)
Collapsed Length	10.56" (26.2 cm)
Stroke	5.04" (12.8 cm)
Shock Rod	.50" (1.27 cm)
IFP Depth	1.22" (3.1 cm)
Shaft PN	1500599
PSI	200 (13.8 bar)

Walker Evans RTS 7043235

ITEM	NOTE
Extended Length	16.71" (42.4 cm)
Collapsed Length	10.96" (27.8 cm)
Stroke	5.75" (14.6 cm)
Shock Rod	.50" (1.27 cm)
IFP Depth	7.25" (18.4 cm)
Shaft PN	1800296
PSI	200 (13.8 bar)
Fluid	Walker Evans 5 wt

Fox RTS (M-10) 7043216

ITEM	NOTE
Extended Length	14.12" (35.9 cm)
Collapsed Length	9.29" (23.6 cm)
Stroke	4.83" (12.3 cm)
Shock Rod	.50" (1.27 cm)
IFP Depth	2.40" (6.1cm)
Shaft PN	1500562
PSI	300 psi (20.6 bar)
Spring (Spring Ratio)	7042206 (425 lb/in 7.6 kg/mm) 7042207 (273 lb/in 4.9 kg/mm) 7042208 (715 lb/in1.8 kg/mm)
Free Length	7042206 (6.20" / 157 mm) 7042207 (5.40" / 137 mm) 7042208 (6.20" / 157 mm)

SHOCK MAINTENANCE

⚠ CAUTION

EXTREME CAUTION SHOULD BE OBSERVED WHILE HANDLING AND WORKING WITH HIGH PRESSURE SERVICE EQUIPMENT. WEAR A FACE SHIELD, SAFETY GLASSES, AND EAR PROTECTION DURING SERVICE OF THESE SHOCKS. CARE SHOULD BE OBSERVED WHILE HANDLING THE INFLATER NEEDLE AND PRESSURE GAUGES. MAINTAIN YOUR EQUIPMENT AND KEEP IT IN GOOD WORKING CONDITION. IF INJURY SHOULD OCCUR, CONSULT A PHYSICIAN IMMEDIATELY. EXTREME CLEANLINESS IS OF UTMOST IMPORTANCE DURING ALL DISASSEMBLY AND REASSEMBLY OPERATIONS TO PREVENT ANY DIRT OR FOREIGN PARTICLES FROM GETTING INTO THE SHOCKS. KEEP THE PARTS IN ORDER AS THEY ARE DISASSEMBLED. NOTE THE DIRECTION AND POSITION OF ALL INTERNAL PARTS FOR REASSEMBLY.

⚠ CAUTION

BEFORE SERVICING A GAS SHOCK IT IS IMPORTANT THAT ALL THE GAS PRESSURE BE DISCHARGED FROM THE UNIT. REFER TO THE INSTRUCTIONS LISTED BELOW FOR THE PROPER PROCEDURE OF DISCHARGING THE GAS PRESSURE FROM A SHOCK. PROTECTIVE EYE WEAR SHOULD BE WORN TO AVOID RISK OF INJURY WHILE SERVICING RYDEFX GAS CHARGED MONO-TUBE SHOCKS.

⚠ CAUTION

WHEN REMOVING THE SPRING FROM A SHOCK THAT UTILIZES A FIXED LOWER RETAINER; THE USE OF A PROPER SPRING COMPRESSOR SHOULD BE USED TO AVOID RISK OF BODILY INJURY.

⚠ WARNING

WHEN USING COMPRESSED AIR TO DRY COMPONENTS, PROTECTIVE EYE WEAR SHOULD BE WORN TO AVOID RISK OF INJURY.

⚠ CAUTION

IT IS IMPORTANT THAT THE GAS SHOCK BE RETAINED IN THE VISE BY THE LOWER MOUNT. ANY OTHER METHOD OF SECURING THE CHOCK BODY DURING THESE PROCEDURES MAY DEFORM THE SHOCK BODY CYLINDER.

⚠ WARNING

NITROGEN GAS IS UNDER EXTREME PRESSURE. USE CAUTION WHEN RELEASING NITROGEN GAS FROM SHOCK. PROTECTIVE EYE WEAR SHOULD BE WORN TO AVOID RISK OF INJURY.

⚠ CAUTION

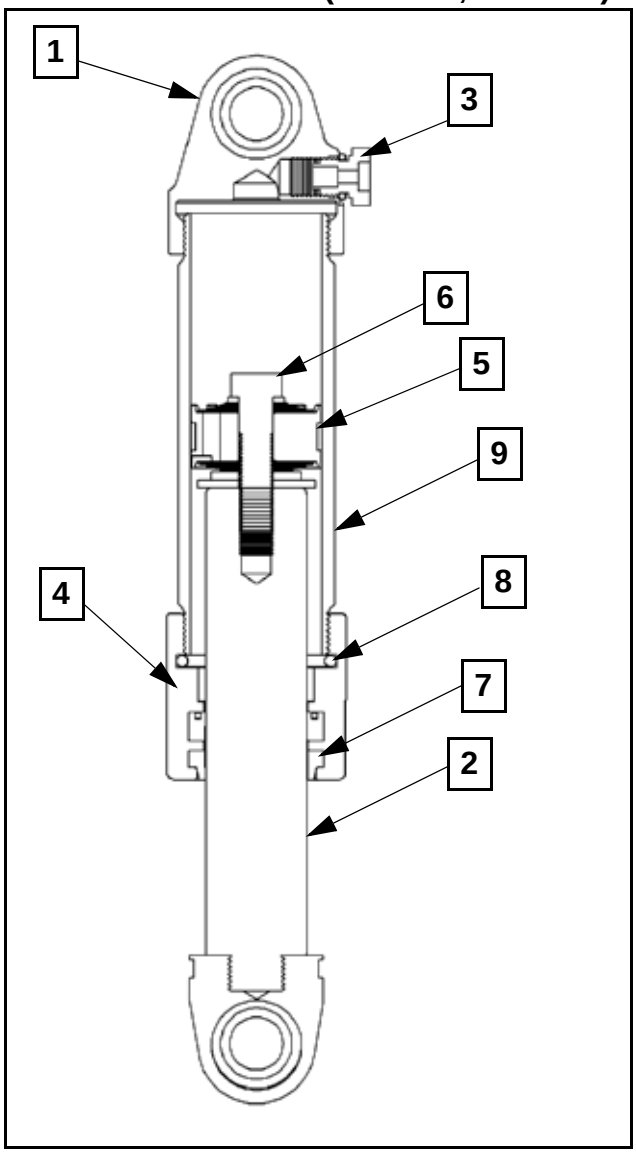
Point air valve away from face and body when charging or discharging any shock.

Shock Maintenance

Changing oil on Shocks is recommended annually and should be included when performing end of season storage preparation. This oil change is necessary to avoid any chance of corrosion which could be caused by moisture contamination.

When performing maintenance on Shocks, use Gas Shock Recharging Kit PN 2200421. It consists of the necessary valves, pressure gauge, and fittings to deflate and pressurize the shocks. The Body Holder Tool, Internal Floating Piston (IFP), and Shock Rod Holding Tool are not included in the Recharging Kit and must be ordered separately. Refer to your SPX Specialty Tool catalog for part numbers.Videos on shock rebuilding are also available. Monotube shocks PN 9917736, Remote Reservoir Shocks PN 9917737.

Walker Evans Shocks (7043234, 7043233)



This type of shock has some critical servicing items that you will need to address when servicing these shocks. There are three ways that you can adjust the performance of the shock; by adjusting the shim stack, adjusting the fluid level and adjusting the pressure.

Shim stacks can be adjusted just like any other shock.

Nitrogen pressure must be 215 psi (14.8 bar) for these shocks (7043234, 7043233).

Fluid level must be at 70cc for the front track shock and 95 cc for the IFS shock.

IMPORTANT: Some important notes when rebuilding these shocks are listed in bullet points below.

- Protect the shock rod with supplied sleeve when removing or installing the shock on the vehicle.
- When charging or discharging the shock always have the shock rod facing downward.
- Fluid level and Nitrogen pressure are critical.

1. Place the body cap (1) of the shock in the vise so that the shock rod (2) is facing downward.
2. Remove the service port screw (3) and release the pressure with the shock charging needle.
3. Make sure that all pressure is out of the shock or oil may spray out in step 5.
4. Place the body cap (1) in the vise, so that the shock rod (2) is facing upward.
5. Slowly loosen the shock rod bearing cap (4) and remove it from the shock.
6. Empty all the shock oil from the shock body and discard the old oil.
7. At this time you can service or adjust the valve stack (5) as needed.
8. If service or adjustment was done at this time torque the piston retaining bolt (6) to 25-30 ft-lb (34-41 N-m).

= T
Piston retaining bolt: 25-30 ft-lb (34-41 N-m)

9. If needed remove the body cap and install a seal (7)/O-ring (8) kit.
10. Place the specified amount of fluid into the shock body.

SHOCK PN	FLUID LEVEL
7043234 (FTS)	70cc
7043205 (RTS)	95cc

IMPORTANT: Be sure to only insert the required amount of 5wt shock fluid -2cc / + 1cc. If more than the specified amount is inserted shock damage will occur.

11. Insert and torque down the shock rod assembly into the shock body (9) to 85 ft-lb (115 N-m).

= T
Body Cap Torque: 85 ft-lb (115 N-m)

CAUTION
Do not over torque the shock rod bearing cap or shock performance will be compromised.

12. Flip shock over in the vice so that the shock rod is facing downward.
13. Pressurize the shock to 215 psi (14.8 bar).

IMPORTANT: Fill shock with Nitrogen to 215 psi (14.8 bar). Do not fill the shock and re-check. The volume in

the gauge will deplete the pressure in the shock and will affect performance.

14. Check for any leaks.
15. Protect the shock rod (2) and carefully place it back onto vehicle.

Ryde Fx Mono-tube Shock Disassembly

Procedures for the proper disassembly and assembly of RydeFX gas charged IFP and emulsion mono-tube shock absorbers.

1. Remove the shock(s) from the vehicle.
2. Before unscrewing pre-load springs, measure the compressed length of the installed spring and mark position for reinstallation.
3. If the shock incorporates a spring, remove the spring and all collateral retainers.
4. Wash the shock body in parts cleaner; then dry with compressed air to remove sand and dirt.
5. Remove bearing, sleeve and/or bushings from lower shock mount eyelet. Secure the lower mount of the shock in a vise. The use of soft jaws is recommend to prevent damage or marks to the shock.
6. Remove the small button head screw from the pressure valve assembly.
7. Depressurize the shock.
8. Internal Floating Piston Shocks, using a slotted screwdriver, loosen the pressure valve assembly counter-clockwise two full revolutions allowing the gas pressure to fully escape past the pressure valve assembly O-ring.
9. Emulsion Shocks: With the shock inverted and the piston rod fully extended, secure the lower mount of the shock in a vise. Allow a couple of minutes for the gas pressure to separate from the oil and rise to the top. Using a rag as a shield to prevent spraying gas and oil; place rag over top the pressure valve assembly and slowly loosen the valve assembly with slotted screw driver three full revolutions, allowing all the gas pressure to escape past the pressure valve assembly O-ring.
10. Allow all the gas pressure to escape before proceeding with the removal of the pressure valve assembly. Pressurized gas and shock oil could eject the valve assembly from the cylinder resulting in bodily injury.
11. Using a slotted screwdriver, remove the pressure valve assembly from the lower end mount. Account for an O-ring.
12. Using an adjustable face spanner (PN PS45262), fully loosen and remove cylinder head assembly.
13. Pour the oil out of the shock body. Discard old oil into an approved storage container and dispose appropriately. Never reuse damper oil during shock rebuild.
14. Using the I.F.P extraction tool thread the tool into the I.F.P and pull upwards, removing the I.F.P from the shock body. Account for wear band and an O-ring. Note: Not applicable for emulsion shock
15. Clean the inside of the shock body using clean parts-cleaning solvent and blow dry using compressed air.
16. Place the shock piston rod upper mount in bench vise, begin piston and valve removal. Arrange parts removed in the sequence of disassembly. The piston should have the flat slots facing the nut end (as highlighted in black).
17. Items to inspect: Piston rod for straightness, nicks or burrs. Cylinder Head Assembly / DU Bearing clean, inspect, or replace. Inside of shock body for scratches, burrs or excessive wear. Teflon piston and I.F.P wear band for cuts, chipped or nicked edges, or excessive wear. O-rings for nicks, cuts, or cracks. Cap and rod seals for nicks, cuts or cracks. Valve discs for kinks or waves. Compression bumpers (ski shocks only) for chipping, cracking or missing. Should any of these items be in question replacement is recommended.

Ryde Fx Mono-tube Shock Assembly

1. Place the piston rod upper mount into the vise. Reassemble damper rod assembly in the reverse order of disassembly. Special attention should be paid the order of the Rebound and Compression disc (shim) stacks, ensuring that they are in the same order prior to disassembly. Tighten the lock nut to 15-20 ft-lb. of torque. DO NOT OVER-TORQUE. If excessive torque is applied, damage to the piston and valves will occur.
2. Secure the shock body by its lower mount in vise. The use of soft jaws is recommend to prevent damage or marks to the shock. It is important that the gas shock be retained in the vice by the lower mount. Any other method of securing the shock body during these procedures may deform the shock body cylinder.

NOTE: The next points on IFP are not applicable for emulsion shocks. Proceed to assembly of the pressure valve.

3. Thread the positioning head onto the I.F.P locator tool and adjust the top of the value indicator to the appropriate measurement. Depending on which shock absorber is being worked on, adjust the piston location tool to the specified depth indicated in the shock specification chart.
4. Apply a thin film of oil onto the floating wear band and O-ring and install the floating piston into the top of the shock body, positioning it below the counterbore.
5. Using the tool as a handle, push the floating piston down into the shock body, being careful not to damage I.F.P wear band and O-ring, until the value indicator knob comes in contact with the shock body. The piston should now be located correctly.
6. Screw the pressure valve assembly into the valve port by hand with a slotted head screwdriver; and tighten to 100-110 in.lb of torque.
7. Fill the shock body with shock oil. Internal Floating Piston Shocks: Fill the shock body with shock oil to the bottom of

the thread within the cylinder. Emulsion Shocks: Fill shock body with 110cc's of oil. This will allow for the required air space to properly gas charge the shock with nitrogen gas.

NOTE: After filling the shock body with oil, allow a couple of minutes for all air bubbles to rise to the top.

8. With the cylinder head assembly pushed down against the piston, carefully, insert the piston rod and assembly into the cylinder; Slightly oscillating the piston rod to allow piston to enter shock body bore. A light coating of oil on the piston wear band will ease installation.
9. Slowly push the piston rod and assembly into shock body until the cylinder head assembly bottoms on the cylinder counterbore. Slight up and down movement may be required to allow all air to pass through piston assembly.
10. During installation, some shock oil will overflow. Wrap a shop cloth around shock body to catch possible oil overflow. Fast installation of the piston rod and assembly may displace the floating piston from its original position. This must not occur if the damper is expected to perform as designed.
11. Using an open face spanner wrench tighten cylinder head securely into the shock cylinder.
12. Pressurize the shock, through the pressure valve, with nitrogen gas to the specified pressure.
13. If using RydeFX inflation tool Refer to Procedures for use of replaceable inflation needle instruction manual found in the RydeFX inflation tool case.
14. After being compressed, the piston rod should fully extend from the shock body once the shock has been pressurized.
15. Install the small button head screw in the pressure valve assembly and tighten securely.
16. Reinstall sleeve and bushings in lower shock mount.

Fox Monotube Disassembly

1. Remove the shock from the vehicle.
2. Remove the steel sleeve from the eyelet using the mallet and an appropriate sized socket.
3. Pry the polyurethane bushings out using the flat blade screwdriver, being careful not to scratch the body cap.
4. Clean the entire shock assembly with soapy water. Try to remove as much dirt and grime as possible by scrubbing with a soft bristle brush. Never pressure wash your shock, as this can force water and debris inside which will damage the seals. Dry the shock assembly with compressed air, if available, or use clean towels.
5. Use a 3/32" Hex Key to remove the button head screw from the FOX air valve in the shock body.
6. Securely clamp Fox Nitrogen Safety Needle in vice.
7. Insert the Fox Safety Needle squarely into center of gas valve.
8. Using a blunt object, depress the air valve core to release pressure.
9. When the shock is FULLY DISCHARGED, pull reservoir away from the Fox Safety Needle in a straight, smooth motion.
10. Clamp the body end eyelet of the shock securely in vice with shaft side up.
11. Using the 1 3/8" wrench, loosen and unscrew the bearing assembly from the shock body. If the body cap unscrews instead of the bearing, that is OK. You will need to remove both for this rebuild procedure.
12. Clamp the shock in the vice using the body clamp blocks. If the bearing is still in the body, use the 1 3/8” end wrench to loosen and unthread the bearing. If the body cap is what needs removal, use the large crescent wrench to loosen and unthread the body cap.
13. Remove the shaft assembly from the body tube, and place on a clean, lint free paper towel. Remove the shock from the vice and pour shock oil from body tube into a proper disposal container. Do not re-use old shock oil.
14. Using the handle of the mallet, push the IFP out of the shock body on to a folded shop towel.
15. Remove the bleed screw from the IFP using the 1/8" T-Handle
16. Clean the IFP with solvent. Dry with compressed air in a well ventilated area. If compressed air is not available, dry parts using clean, lint free paper towels and let sit in a well ventilated area to allow the solvents to evaporate.
17. Set body assembly aside on a clean, lint free towel.
18. Clamp the shaft eyelet securely in vice with the piston end up.
19. Using a 9/16" wrench, remove the piston lock nut from the end of the shaft.
20. Hold the tip of the Phillips Head Screwdriver against the end of shaft. Hold the piston assembly under the top-out plate and lift upwards. Slide the piston assembly onto the shaft of the screwdriver. Pull the Screwdriver away from shock shaft while supporting the piston assembly. Set this on a clean, lint free towel. There are many pieces to the piston assembly, and the assembly order of these pieces is critical to the proper performance of your shock. This step ensures that the proper order is kept.
21. Slide bearing assembly off of shaft. Use extreme caution not to scratch inside of the bearing assembly when passing it over the threads at end of shaft and set it on a clean, lint free towel.
22. Remove the bleed screw from the IFP and set them both on a clean, lint free towel.

Fox Monotube Assembly

1. Using a small pair of snap ring pliers, remove the snap ring from the bearing housing. Using your fingers, remove the

FIST scraper from the housing. Use a scribe or a dental pick to remove the o-ring from the inside of the FIST scraper by "spearing" the seal with the point of the scribe and pulling it out. Use extreme caution when using a scribe to remove seals. Always "spear" the seal with the point of the scribe. Do not wedge the point of the scribe in behind the seal. This can scratch the surface of the seal groove which will compromise the performance and reliability of the shock absorber.

2. Use the scribe to remove the u-cup wiper and o-ring seals from the bearing housing. Be careful not to scratch the seal grooves or the DU bushing that is pressed into the bearing.
3. Thoroughly clean the FIST scraper, bearing housing, and piston assembly with solvent. Dry with compressed air in a well ventilated area. If compressed air is not available, dry parts using clean, lint free paper towels and let sit in a well ventilated area, to allow the remaining solvent to evaporate.
4. Use a scribe or dental pick to remove the o-ring seal from the IFP.
5. Install the new, well lubricated, o-ring into the FIST scraper. Check to make sure the seal is properly seated, and is not twisted. If a tool is required to aid in proper seating of o-ring, use the non-writing end of a pen, or a similar soft, blunt object, to push it in.
6. Install the new, well lubricated, o-rings into the bearing housing. Correct placement of the shaft seal o-ring is in the groove next to the DU bushing. Check to make sure the seals are properly seated, and are not twisted. If a tool is required to aid in proper seating of o-ring, use the non-writing end of a pen, or a similar soft, blunt object, to push it in.
7. Install the new U-cup seal into bearing. U-cup should be installed so the cupped end is facing the DU bushing inside of bearing. Check to make sure seal is properly seated. If a tool is required to aid in proper seating of U-cup seal, use the non-writing end of a pen, or a similar soft, blunt object, to push it in.
8. Install FIST bearing into housing. Check for proper orientation of the FIST bearing. The stepped side of the FIST bearing should be visible.
9. Using a small pair of snap-ring pliers, install the snap-ring into the bearing housing. Check for proper orientation of the snap ring. The flat side of the snap-ring should be visible. Check to make sure the snap-ring is properly seated.
10. Install the new, well greased o-ring onto the IFP.
11. Install the new, well greased o-ring on the IFP bleed screw.

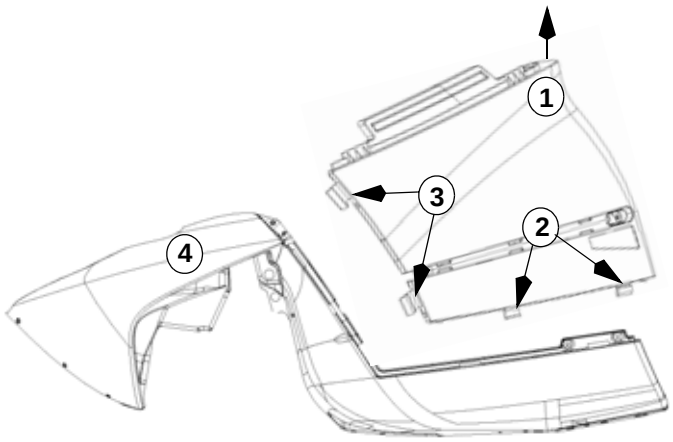
REAR SUSPENSION TROUBLESHOOTING

PROBLEM	SOLUTION
Rear suspension bottoms too easily	Increase rear shock compression valving by turning screw clockwise (if equipped with optional Indy Select shock) or refer to optional valving on Suspension Wall chart for Fox equipped models.
	Increase torsion spring preload
Rides too stiff in rear	Check for binding suspension shafts and grease all pivot points.
	Decrease torsion spring preload adjustments.
	Decrease rear shock compression valving by turning screw counterclockwise (if equipped with optional Indy Select shock) or refer to optional valving on Suspension Wall chart for Fox equipped models.
Setting up for deep snow operation	Change worn rail slides.
	Increase front limiter strap length
	Based on rider preference, RRSS may be removed to increase weight transfer

CHAPTER 10
CHASSIS & HOOD

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SIDE PANELS



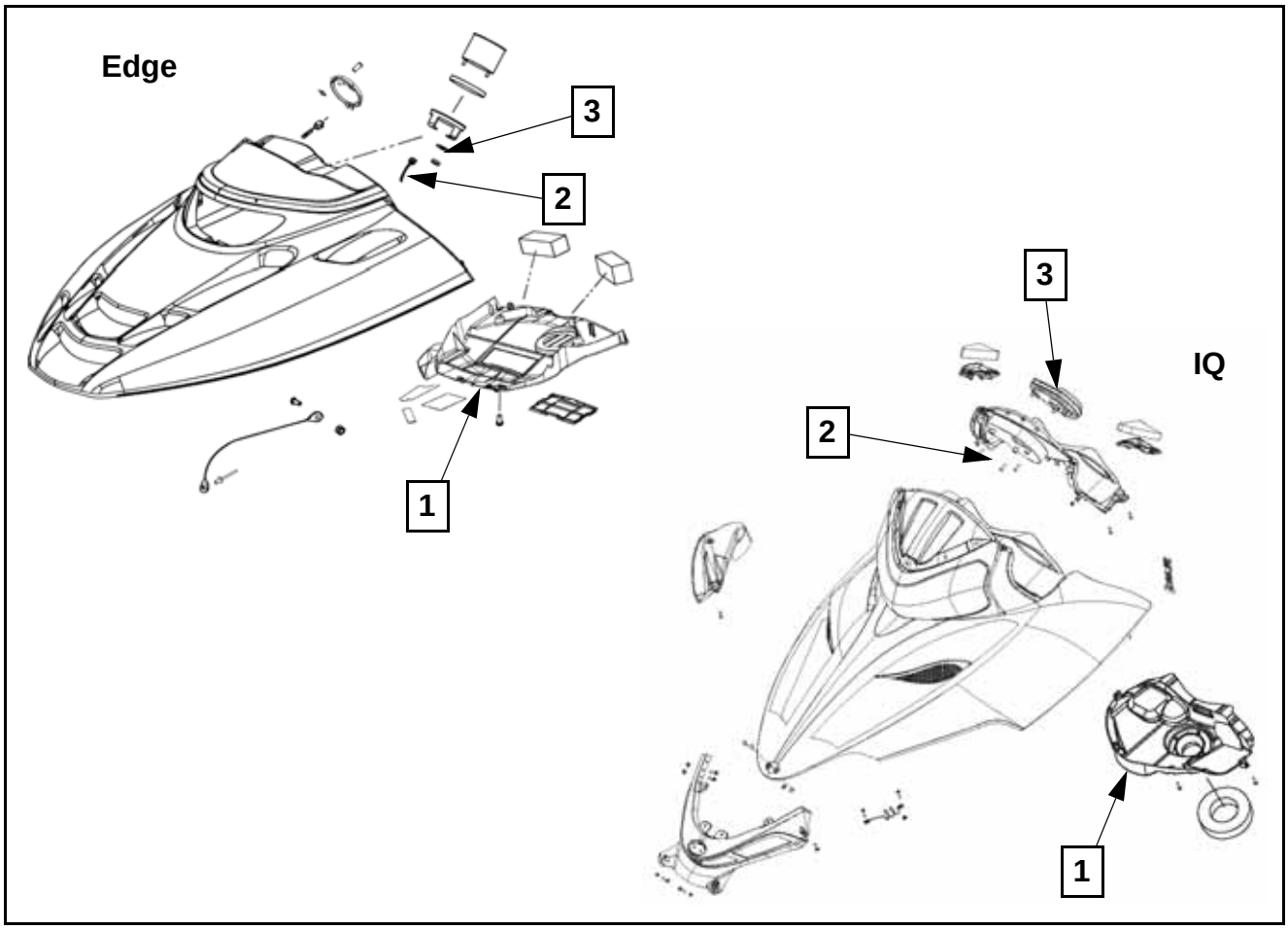
Side Panel Removal

1. Grab the upper portion (**1**) of the panel and lift straight upwards and out toward you. This will lift it over the tab that is located on the console.
2. Lift the lower portion up and out until the tabs (**2**) can be released from the fender (**4**).
3. Pull the panel straight out to release the hinge tabs (**3**) from the fender.
4. Remove panel.

Side Panel Installation

1. Insert the hinge tabs (**3**) into the front portion of the fender (**4**).
2. Close the panel and lift just slightly to insert the lower tabs (**2**).
3. Push in the top portion (**1**) so that the console tab can be inserted into the panel.
4. Push the panel into place.
5. If lower tabs are not inserted, lift up panel and try again.

HOOD ASSEMBLY



Hood Removal/Installation

> **WARNING**
>
> Exhaust system temperatures can exceed 900_ F (500_C). Serious burns may occur if this inspections performed without allowing adequate time for the exhaust system to cool. Never perform this procedure with the engine running.

1. Disconnect the items that are connected to the speedometer.
2. Unplug the hood wiring harness connections.
3. Remove the hood retention cable(s) from hood.
4. Remove the hinge bolts.
5. Remove the hood.
6. Install in reverse order of removal.

Edge Instrument Removal/Installation

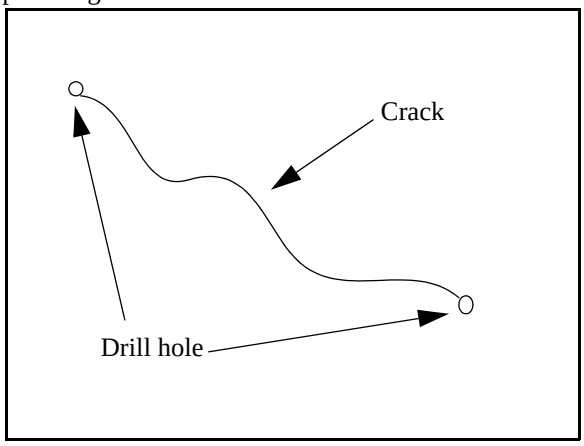
1. Remove the plenum (1).
2. Disconnect the cable or connection (2) from the instrument.
3. Remove the bracket nuts (3).
4. Remove the instrument(s) from the hood.
5. Installation is the reverse of removal.

IQ MFD Removal/Installation

1. Remove the headlight cover assembly (1).
2. Remove the fasteners (2) that hold the MFD (3) into the instrument pod and remove the MFD.
3. Assembly is reverse of installation.

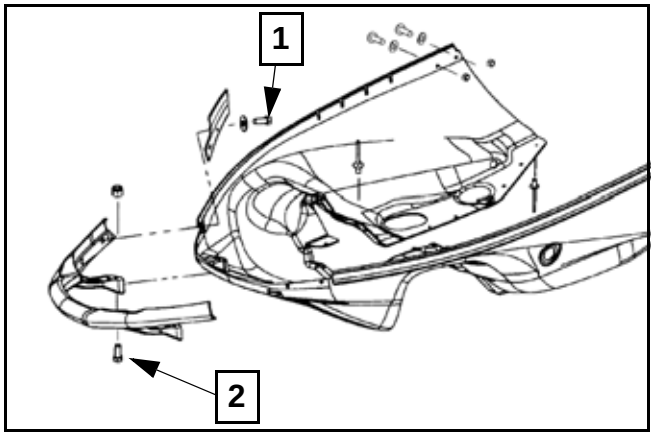
Hood Repair

Currently there is no procedures or materials recommended by Polaris for repairing hoods. Hoods are made of Thermoplastic Olefin (TPO) and cannot be repaired. If a hood is broken it must be replaced. For small cracks you may drill a small hole on both ends of the crack to limit spreading. This procedure is called “stop drilling.



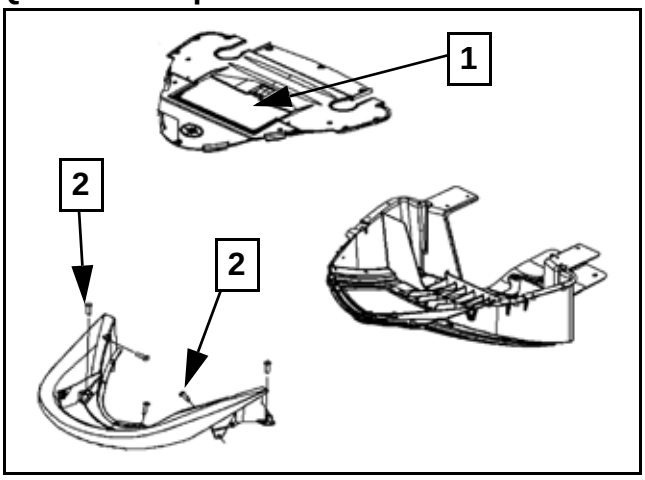
BUMPER

Edge Front Bumper Removal/Installation



1. Remove the inside screws (1) from the bumper.
2. Remove the lower bumper bolts (2).
3. Remove the bumper.
4. Replace in the reverse order.

IQ Front Bumper Removal/Installation



1. Open front nosepan flap (1) and remove the bumper screws (2).
2. Remove the center bumper Nyloc nut and bolts.
3. Remove bumper.
4. Installation is reverse of removal.

Rear Bumper Removal/Installation

1. Remove the rear coolant cover (1) if so equipped.
2. Remove the rear bumper fasteners (2).
3. Remove the bumper.
4. Install in reverse order.

HEADLIGHT

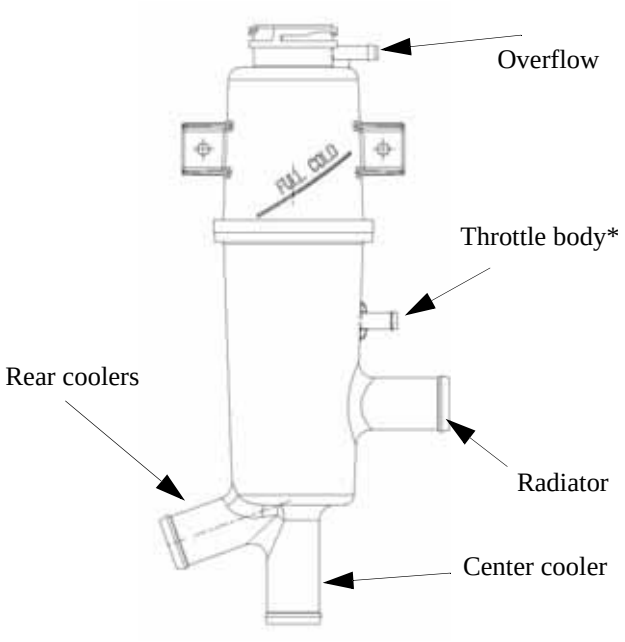
IQ Headlight Removal/Installation

1. Disconnect all the headlight connections.
2. Remove the headlight adjuster guide.
3. Remove the headlight screws that hold the headlight assembly on.
4. Remove the headlight.
5. Installation is the reverse of removal.

Edge Headlight Removal/Installation

1. Remove the plenum from the bottom of the hood.
2. Disconnect the head light connections.
3. Remove the 4 screws holding the headlight in place.
4. Installation is the reverse of removal.

COOLANT/OIL TANK



Coolant Tank Removal

1. Drain coolant.
2. Remove the 2 torx screws that hold the coolant tank to the oil tank.
3. Remove the coolant lines from bottle.
4. Remove coolant bottle.

Coolant Tank Installation

1. Connect coolant lines to the bottle.
2. Tighten the fasteners that hold the coolant bottle to the oil tank.
3. Fill to the correct fluid level.
4. Bleed the cooling system.

OIL TANK

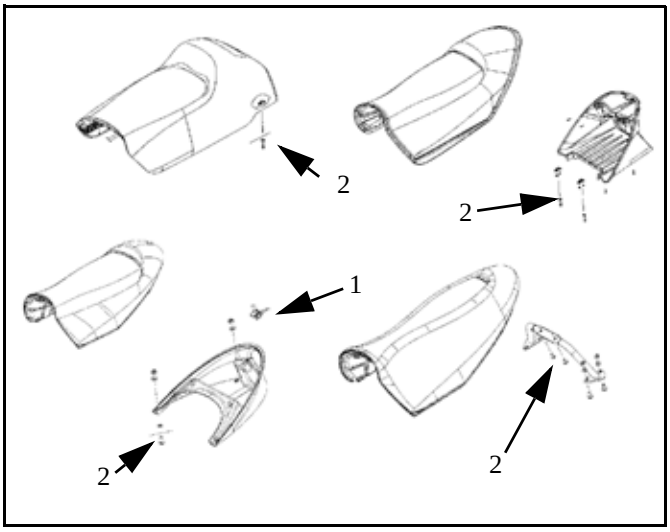
Oil Tank Removal

1. Remove the two fasteners that hold the tank to the chassis.
2. Remove the two fasteners that hold the cooling bottle on the oil tank.
3. Remove the cross shaft oil supply line.
4. Lift the rear of the tank and remove the supply line.
5. Disconnect the oil sender connections.
6. Remove tank.

Oil Tank Installation

1. Attach the supply line to the supply fitting at the bottom of the oil tank.
2. Attach the cross shaft supply line to the fitting on the right hand side.
3. Line up the centering shafts with the chassis centering bracket.
4. Install the coolant bottle on the oil tank.
5. Install the fasteners that hold the tank to the chassis.

SEAT INFORMATION



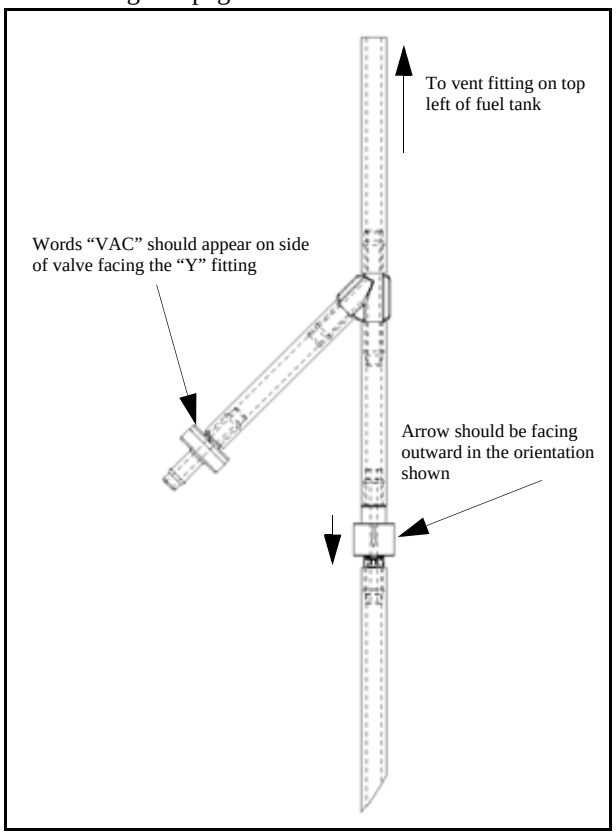
Seat & Base Removal/Installation

1. If unit is equipped with a seat latch (1), remove the seat or passenger seat if so equipped.
2. Remove the fasteners (2) that hold the seat base onto the tunnel or rear seat brace.
3. Unplug the tail light harness if applicable and remove the seat base.

SEAT AND FUEL TANK

IQ Fuel Tank Removal

1. Remove the seat and seat base.
2. Drain any fuel from the fuel tank.
3. Remove the console.
4. Bleed the pressure from the fuel rail if applicable. See "Fuel Rail Bleeding" on page 4.20.

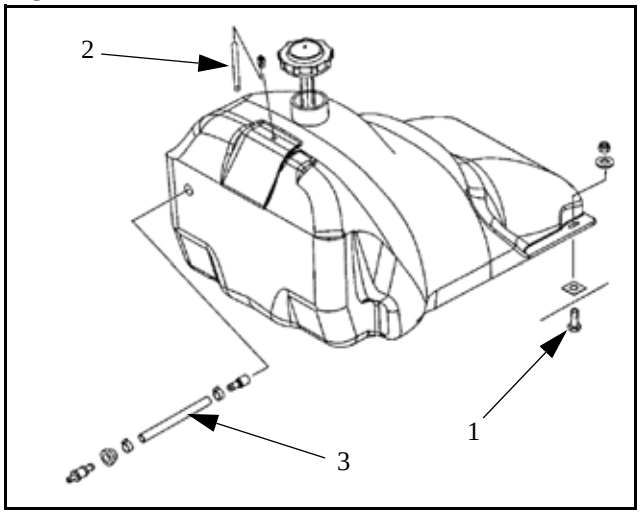


5. Remove the fuel lines from the ridged fuel lines using the fuel line removal tool (PS-47152).
6. Remove the two fasteners (E) that hold the fuel tank (F) onto the chassis.
7. Carefully lift the rear of the fuel tank and slide the fuel tank back so that you can reach the fuel pump harness, and disconnect the harness.
8. Disconnect the fuel tank vent line (J) at the fitting located at the top of the tank.
9. Remove the fuel tank from the chassis.

IQ Fuel Tank Installation

1. Replace the vent line (J) at the fitting located at the top of the tank.
2. Lift the rear of the fuel tank and carefully slide the tank far enough forward to assemble the fuel lines to the fuel pump.
3. Make sure that the fuel tank vent assembly will not be pinched.
4. Slide the fuel tank into place and place the washers and fasteners (E) on that hold the fuel tank (F) to the chassis.
5. Replace the console.
6. Connect the tail light if applicable.
7. Place seat into position.
8. Replace seat fasteners.

Edge Fuel Tank Removal/Installation



1. Remove any fuel that may be in the fuel tank.
2. Remove the seat.
3. Remove the fuel tank fasteners (1) at the rear of the fuel tank.
4. Disconnect the fuel tank vent line (2).
5. Disconnect the fuel supply line (3).
6. Remove the fuel tank.
7. Install in reverse order.

Seat Cover Replacement

1. Remove seat.
2. Remove the old covering by removing the staples that hold it on the base.
3. If replacing the tail light assembly. See “Tail Light Assembly Replacement” on page 10.7.
4. Drape the new cover over the seat foam.
5. Turn the assembly over and begin upholstering by lining up the seat cover vinyl side flaps with the indented square location indicators located on the plastic seat base.

> **⚠ WARNING**
>
> Apply staples in the stapling channel only. If you apply staples outside the channel, you will damage the fuel tank reservoir in the seat base. If this happens you will have to replace the entire seat assembly.

6. Using a staple fun, tack each side of the vinyl cover in place using two staples (1). If cover has a Polaris emblem carefully align emblem with the bottom edge of the seat. This will help ensure that the cover is positioned properly.
7. Align the two sewn seams located at the rear of the seat cover with the two back corners of the seat base.
8. Pull the vinyl tight and tack the seat cover to the plastic seat base in each corner. Use two or three staples per corner.
9. Now that the cover is positioned, and tacked to the plastic seat base in for places, turn the assembly over an inspect it. If the seat cover seems to fit correctly and everything looks straight, including the tool compartment flap, continue.
10. Staple the remainder of the unattached seat cover to the plastic seat base. Always staple between two existing staples and follow this procedure until the seat cover is completely stapled to the seat base see the staple sequence above.
11. Turn the seat cushion assembly over and inspect for wrinkles or imperfections. If imperfections are visible, remove the staples in the affected area and staple correctly.
12. Trim excess vinyl from the bottom around the back of the seat area only after a satisfactory fit is obtained.

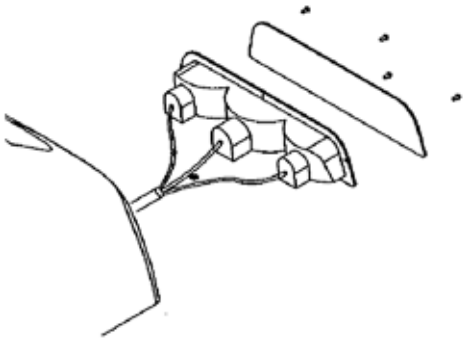
CONSOLE

Console Removal/Installation

1. Place the adjustable steering in the center (if equipped).
2. Remove the two T25 Torx screws (A).
3. Remove filler cap and the threaded filler retainer (B).
4. Remove the two T25 Torx screws on each side of the shroud (C).
5. You can set the console aside with the starter rope still installed or you can carefully un-tie the knot in the recoil handle and route it through the chassis, then secure a knot and let the rope rest on the recoil housing.

TAIL LIGHT

Edge Tail Light Assembly Replacement



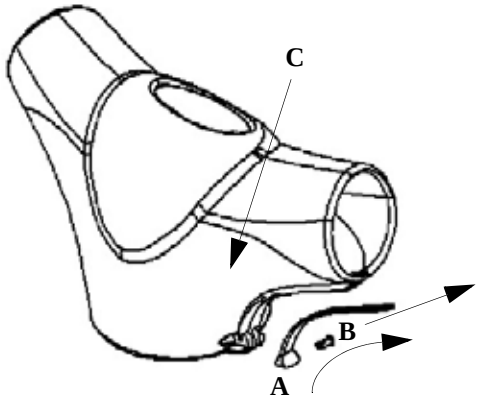
1. Remove the tail light lens.
2. Remove the taillight assembly.
3. Replace taillight assembly.
4. Replace seat.

Tail Light Assembly Replacement

1. After removal of seat cover, drill out three rivets from top of taillight.
2. Remove taillight assembly and wire harness.
3. Install new taillight assembly and rivet into place.
4. Connect taillight wire harness. Taillight harness wires must be routed away from any possible contact with seat cover staples to prevent electrical shorts.
5. Pull seat cover tightly and evenly into position and re-staple to seat pan.
6. Inspect cover for a wrinkle-free finish before reinstalling on the snowmobile.

HANDLEBAR COVER

HANDLE BAR COVER REMOVAL/ INSTALTION



1. Slide handle bar covers slide (A) off on each side.
2. Remove the handle bar cover darts (B) on each side.
3. Remove handle bar cover (C).
4. Installation is in reverse order of removal.

SKIS

SKI REMOVAL

1. Securely lift the front of the machine off the ground.
2. Remove the ski to spindle bolt and washers.
3. Remove ski, bushing and ski bumper.

SKI INSTALLATION

1. Place ski, bushing and bumper onto spindle.
2. Insert the ski to spindle bolt through the ski and spindle.

NOTE: The ski bumper is orientated so that the "FRONT" label is installed toward the toe of the ski.

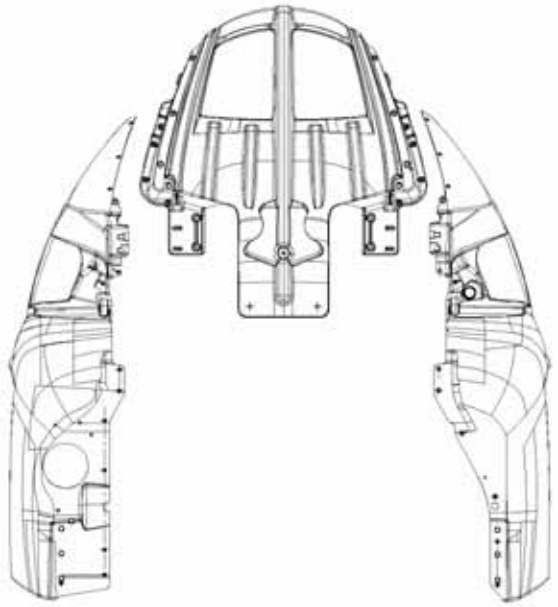
3. Tighten the nuts.

NOSEPAN

REPLACEMENT

IMPORTANT: When installing a replacement nosepan, the open circles represent rivets installed from inside the nosepan through the bottom. The filled in circles represent rivets installed from the under side of nosepan through to the top.

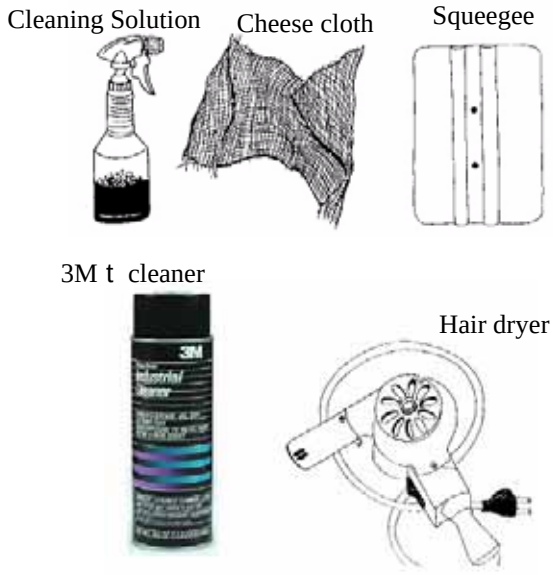
NOTE: Rivet holes may require drilling into the bulkhead. When transfer drilling holes do not force the nosepan into a position which is not uniform to the other side. Rivet holes across from each other.



DECALS

DECAL REMOVAL

Before you begin, read these instructions and check to be sure all parts and tools are accounted for.



You will need the following items:

- Squeegee
- Cheese Cloth or a non abrasive cloth
- Paper Shop Towels
- Hair Drier or Heat Gun
- Wallpaper seam roller or similar roller
- 3M t citrus based clear (3M t PN 62-4615-430-5) available at most auto parts stores
- Cleaning solution (99% water 1% mild dish washing detergent)
- Scotch® 233 Performance masking tape

Perform the decal removal procedures carefully! If care is not taken, the possibility exists that paint could peel from the hood. Follow each step thoroughly and completely to avoid hood damage! **Polaris is not responsible for any hood or paint damage resulting from this decal replacement procedure**.

> ⚠ CAUTION
>
> USE SAFETY GLASSES AND RUBBER GLOVES WHEN PERFORMING THIS PROCEDURE.

1. Using masking tape, tape off all decals that are not going to be replaced. If you do not tape off the other decals, the cleaning solution used later in the process may cause the adhesive to break down in the non-affected decals.



2. Using a hair dryer (preferable) or low setting on a heat gun, carefully heat the decal to loosen the adhesive. Heat until the decal is warm to touch. **DO NOT OVER HEAT! Overheating may cause damage to the paint and to the integrity of the hood.** Polaris is not responsible for any hood damage resulting from this decal replacement procedure.
3. Once the decal is warm to touch and the adhesive is loose, peel the decal off slowly and evenly. **Use of a hair dryer or heat gun is required!** If heat is not applied, the decal will be very hard to remove and paint from the hood may peel off with the decal.
4. After the decal is removed, apply 3M t citrus based cleaner to the decal area to remove the adhesive. Be sure to follow the instructions and the precautions on the container, and use rubber gloves and safety glasses. Spray the cleaner on the adhesive and let set for 15-20 seconds. Using a squeegee, wipe the adhesive from the hood and deposit it in a paper shop towel. You may have to repeat this process several times to remove all of the adhesive from the hood. Use care not to get the cleaner on any other decals.



5. When the bulk of the adhesive is removed from the hood by using the squeegee, remove any left over residue with a clean, non-abrasive shop towel or cheese cloth that is wet with the 3M t cleaner.

6. Once all of the adhesive is removed from the decal area, follow with a cleaning solution of 99% water to 1% mild dishwasher detergent. Use a non-abrasive cloth with the solution to remove dirt, grease, cleaning solvent, and finger prints. Always clean the surface where the decal will be applied.



⚠ WARNING

IT IS EXTREMELY IMPORTANT TO REMOVE ALL TRACES OF DIRT AND DEBRIS FROM THE HOOD WHERE THE DECAL IS TO BE APPLIED. LEFT OVER DEBRIS WILL BE MAGNIFIED THROUGH THE CHROME DECALS.

DECAL INSTALLATION

All decals should be applied indoors, free from dust, dirt, cold air, and humidity. Room temperature must be between 40_ and 100_F (4 - 38_C). These decals are to be applied dry.

1. Make sure the surface area of the hood where the decal is to be placed is free of any dirt, debris, or adhesive.



2. Place the decal in the area to be installed and make sure that everything lines up properly.
3. When you're ready to install the decal, carefully peel away the adhesive side of the decal.
4. Apply the decal and slowly work the decal down the side of the hood using a clean squeegee to lay the decal straight and to avoid creating air bubbles. Do NOT remove the decal mask until the decal is fully applied. If you attempt to use a squeegee on the decal with the chrome exposed, the chrome will be damaged.



⚠ CAUTION

ONCE THE ADHESIVE STICKS, IT CAN BE VERY DIFFICULT TO PULL THE DECAL BACK OFF OF THE HOOD. USE EXTREME CARE! IF YOU ENCOUNTER AIR BUBBLES DO NOT ATTEMPT TO USE A STRAIGHT PIN TO POKE THE BUBBLE AND LET THE AIR OUT. A HOLE POKED IN A CHROME DECAL WILL BE VERY NOTICEABLE.

5. When finished installing the decal, carefully remove the decal mask at a 180_ angle.



6. Peel the backing off and install the urocals in the appropriate places. These also have strong adhesives and once applied they cannot be removed easily. Use a wall paper roller to adhere all surfaces of the urocal. Urocal decals are rigid and need to be rolled to ensure good adhesion, particularly on the edges.




POLARIS
Vertical


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NOTES

CHAPTER 11

BATTERY & ELECTRICAL SYSTEMS

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SPECIFICATIONS

Engine Models

Model Number	Engine
EC34	Fuji 340cc
EC50PL	Fuji 488cc LC
EC55PM	Fuji 544cc FC
S3303-5044-PFSC	Liberty 500cc EV / LC
S3273-6044-PF6F S3274-6044-PF6F	Liberty 600cc HO Carbureted
S3206-6044-PF6H	Liberty 600cc HO CFI
S3305-7044-PF7J S3322-7044-PF7J	Liberty 700cc HO CFI

Spark Plugs

Model	Spark Plug	Gap (Inches / mm)
EC34	NGK BR8ES	0.028 / 0.70
EC50PL	Champion RN3C	0.028 / 0.70
EC55PM	NGK BR9ES	0.028 / 0.70
S3303-5044-PFSC S3273-6044-PF6F S3274-6044-PF6F S3206-6044-PF6H S3305-7044-PF7J S3322-7044-PF7J	Champion RN57YCC	0.025 / 0.63

Charging System

Model	Stator Output	# of Pulses
EC34	240W	6
EC50PL	200W	2
EC55PM	240W	6
S3303-5044-PFSC S3273-6044-PF6F S3274-6044-PF6F	280W	6
S3206-6044-PF6H S3305-7044-PF7J S3322-7044-PF7J	400W	N/A

Ignition Timing

Model	Specification
EC34	26.5° @ 3000 RPM
EC50PL	28° @ 3000 RPM
EC55PM	27° @ 3500 RPM 14° @ 6500 RPM
S3303-5044-PFSC	25° @ 2500 RPM (Disconnect TPS)
S3273-6044-PF6F S3274-6044-PF6F	26° @ 3500 RPM (Disconnect TPS)
S3206-6044-PF6H S3305-7044-PF7J S3322-7044-PF7J	18° @ Idle (1700 RPM [0.95Vdc TPS]) and 120° Engine Coolant Temperature

⚠ WARNING

BATTERY ELECTROLYTE IS POISONOUS. IT CONTAINS ACID!

SERIOUS BURNS CAN RESULT FROM CONTACT WITH THE 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 CLOSED SPACE. ALWAYS SHIELD EYES WHEN WORKING NEAR BATTERIES.

KEEP OUT OF REACH OF CHILDREN.

CONVENTIONAL BATTERY

NOTE: Do not service the battery unless it will be put into regular service within 30 days.

Battery Preparation

1. Fill battery with electrolyte to the upper level marks on the case.
2. Set battery aside and allow it to cool and stabilize for at least 30 minutes.
3. Add electrolyte to bring the level back to the upper level mark on the case.

NOTE: This is the last time electrolyte is added. After charging the battery, only add distilled water.

4. Charge battery at 1/10 of its amp/hour rating. Example:1/10 of 9 amp battery =.9 amps, 1/10 of 14 amp battery = 1.4 amps, 1/10 of 18 amp battery = 1.8 amps (recommended charging rates).
5. Check specific gravity of each cell with a hydrometer to ensure each has a reading of 1.270 or higher.
6. Install vent covers.

Specifications

Battery PN 4140006

Battery Type	YB14A-A2 - Conventional
Nominal Capacity	12Vdc / 14AH
Electrolyte Volume	30.4oz.
CCA @ 0F (-18C)	195 AMPS
Charging Current	1.4 AMPS

Battery PN 4140005

Battery Type	Y50-N18L-A - Conventional
Nominal Capacity	12Vdc / 20AH
Electrolyte Volume	47.3oz.
Charging Current	2 AMPS

Refilling a Conventional Battery

The normal charge/discharge cycle of a battery causes the cells to give off gases. These gases, hydrogen and oxygen, are the components of water. Because of the loss of these gases and the lowering of the electrolyte level, it will be necessary to add pure, clean distilled water to bring the fluid to the proper level. After filling, charge the battery to raise the specific gravity to 1.270 or greater.

FRESH PACK BATTERY

NOTE: Do not service the battery unless it will be put into regular service within 30 days.

Battery Preparation

Some models are equipped with a fresh pack battery. These batteries require filling with electrolyte and a full charge prior to service.

1. Fill battery with electrolyte to the upper level marks on the case.
2. Set battery aside and allow it to cool and stabilize for at least 30 minutes.
3. Add electrolyte to bring the level back to the upper level mark on the case.

NOTE: This is the last time that electrolyte should be added.

4. Charge battery at 1/10 of its amp/hour rating. Example:1/10 of 9 amp battery =.9 amps, 1/10 of 14 amp battery = 1.4 amps, 1/10 of 18 amp battery = 1.8 amps (recommended charging rates).
5. Check specific gravity of each cell with a hydrometer to ensure each has a reading of 1.270 or higher.
6. Install vent cover.

NOTE: Once the vent cover is installed, the battery is sealed. Do not remove the cover.

Specifications

Battery PN 4011092 (4010905)

Battery Type	YTX14AH-BS-Fresh Pack
Nominal Capacity	12Vdc / 12AH
Electrolyte Volume	22.3oz.
Specific Gravity	1.320
CCA @ 0F (-18C)	210 AMPS
Charging Current	1.2 AMPS

BATTERY TESTING

Testing Procedures

Batteries should be kept at or as near full charge as possible. If the battery is stored or used in a partially charged condition, hard crystal sulfication will form on the plates, reducing their efficiency and possibly ruining the battery.

Open Circuit Voltage Test (OCV)

Check static battery voltage with multimeter. Voltage should be no less than 12.8 Vdc. Charge battery if voltage is lower than 12.8 Vdc.

Load Test

A battery may pass the OCV test, but still not have the storage capacity necessary to properly function.

1. Connect multimeter to the battery as if performing the OCV test.
2. Turn the engine over using the electric starter.
3. Replace battery if Vdc drops below 9.5Vdc.

NOTE: Battery load test tools can be purchased commercially. Follow the manufactures' instructions for use.

Specific Gravity Test (Conventional Battery)

NOTE: Do not attempt to open the vent cover on a fresh pack battery.

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 0.025 between the lowest and highest cell readings indicate a need to replace the battery.

Battery Voltage

STATE OF CHARGE	CONVENTIONAL LEAD-ACID	YUMACRON TYPE
100% CHARGED	12.60v	12.70v
75% CHARGED	12.40v	12.50v
50% CHARGED	12.10v	12.20v
25% CHARGED	11.90v	12.00v
0% CHARGED	< 11.80v	< 11.90v

Battery Voltage Per Cell

STATE OF CHARGE	CONVENTIONAL LEAD-ACID	YUMACRON TYPE
100% CHARGED	1.265v	1.275v
75% CHARGED	1.210v	1.225v
50% CHARGED	1.160v	1.175v
25% CHARGED	1.120v	1.135v
0% CHARGED	< 1.100v	< 1.115v

Off Season Storage

To prevent battery damage during extended periods of non-use, the following maintenance items must be performed.

1. Remove battery from machine and wash the case and battery tray with a mild solution of baking soda and water. Rinse with of fresh water after cleaning.

> ⚠ CAUTION
>
> DO NOT ALLOW ANY OF THE BAKING SODA SOLUTION TO ENTER THE BATTERY OR THE ACID WILL BE NEUTRALIZED.

2. Using a wire brush or knife, remove any corrosion from the cables and terminals.
3. Charge at a rate no greater than 1/10 of the battery's amp/hr. capacity.
4. Store the battery in a cool, dry place.

NOTE: Stored batteries lose their charge at the rate of 1% per day. They should be fully recharged every 30 to 60 days during a non-use period. If stored during winter months, the electrolyte will freeze at higher temperatures as the battery discharges.

Specific Gravity Freezing Point

Specific Gravity of Electrolyte	Freezing Point
1.265	-75_F (-59_C)
1.225	-35_F (-37_C)
1.200	-17_F (-27_C)
1.150	5_F (-15_C)
1.100	18_F (-8_C)
1.050	27_F (-3_C)

IGNITION TIMING

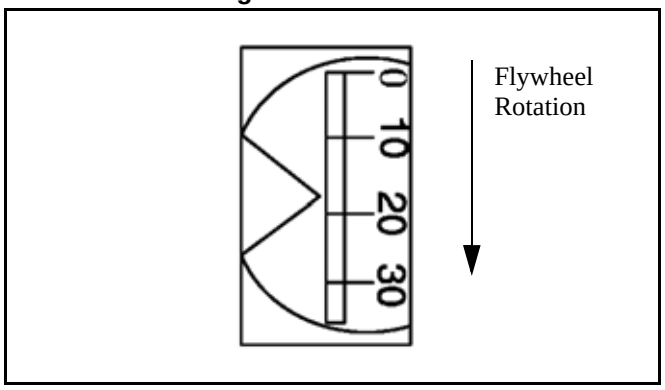
Timing Procedure - Carbureted Engines

NOTE: Always verify timing of engine at room temperature (68°F / 20°C), and at the specified RPM. If applicable, make sure the key switch is in the PREMIUM mode and the TPS is unplugged.

1. Reference the timing specification chart.
2. Install a dial indicator gauge into the MAG spark plug hole.
3. Place the MAG piston in the proper timing position, then mark the flywheel at this point.

EXAMPLE: 600 HO Carbureted = 26° @ 3500RPM. Place the MAG piston 4.0096mm (0.1579in.) BTDC.

NOTE: Each 10 degree mark is separated by lines every 2 degrees (not shown). Acceptable timing variance is +/- 2 degrees.



4. Connect an accurate tachometer and a good quality timing light to the engine according to manufacturer's instructions.
5. Disconnect the throttle position sensor (TPS), if equipped.
6. Start engine and increase RPM to the point specified in the timing specifications. Hold the throttle to maintain specified timing RPM.
7. Point the timing light at the timing inspection hole.
8. With your head positioned so there is a straight line between your eye, the stationary pointer and the crankshaft center line, note the relative position between the marked flywheel line and the pointer. If the stationary pointer is aligned with the mark made in Step 3, or within the acceptable variance, ignition timing is correct.
9. If the pointer is outside the variance, the stator will have to be rotated either with crankshaft rotation (to retard the timing) or against rotation to advance it.

NOTE: Rotate stator plate approximately the same distance as the marks must move. In most cases, the recoil starter housing, recoil drive hub, and flywheel must be removed to loosen the stator bolts and change the timing. On some engines, the stator plate retaining screws can be accessed through the flywheel.

10. Torque stator plate screws and flywheel nut to specified torque. Apply Loctite 262 (red) to crankshaft flywheel taper if required. Refer to the Specifications section for torque specifications and flywheel installation procedure for engine type.

Ignition Timing Chart

Convert the ignition timing specification from degrees BTDC to either inches or millimeters, then use a dial indicator to verify timing marks.

NOTE: Always disconnect the TPS on carbureted engines prior to checking ignition timing.

	EH122		**EC34-2PM**		**EC50PL**		**EC55PM**		**S3303-5044-PFSC S3273-6044-PF6F S3274-6044-PF6F S3206-6044-PF6H**		**S3305-7044-PF7J S3322-7044-PF7J**	
ROD/STROKE (mm)	73mm ROD 43mm STROKE		103mm ROD 55.6mm STROKE		112mm ROD 60mm STROKE		120mm ROD65mm STROKE		128mm ROD 64mm STROKE		128mm ROD 68mm STROKE	
Degrees BTDC	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
1	0.0042	0.0002	0.0054	0.0002	0.0058	0.0002	0.0063	0.0002	0.0061	0.0002	0.0066	0.0003
2	0.0170	0.0007	0.0215	0.0008	0.0232	0.0009	0.0252	0.0010	0.0244	0.0010	0.0262	0.0010
3	0.0381	0.0015	0.0484	0.0019	0.0521	0.0021	0.0566	0.0022	0.0548	0.0022	0.0590	0.0023
4	0.0678	0.0027	0.0860	0.0034	0.0926	0.0036	0.1006	0.0040	0.0974	0.0038	0.1048	0.0041
5	0.1059	0.0042	0.1343	0.0053	0.1447	0.0057	0.1571	0.0062	0.1522	0.0060	0.1637	0.0064
6	0.1524	0.0060	0.1933	0.0076	0.2083	0.0082	0.2261	0.0089	0.2190	0.0086	0.2356	0.0093
7	0.2073	0.0082	0.2630	0.0104	0.2833	0.0112	0.3076	0.0121	0.2979	0.0117	0.3205	0.0126
8	0.2706	0.0107	0.3432	0.0135	0.3698	0.0146	0.4016	0.0158	0.3889	0.0153	0.4184	0.0165
9	0.3422	0.0135	0.4341	0.0171	0.4677	0.0184	0.5079	0.0200	0.4919	0.0194	0.5291	0.0208
10	0.4222	0.0166	0.5355	0.0211	0.5770	0.0227	0.6265	0.0247	0.6068	0.0239	0.6528	0.0257
11	0.5104	0.0201	0.6474	0.0255	0.6976	0.0275	0.7575	0.0298	0.7336	0.0289	0.7892	0.0311
12	0.6068	0.0239	0.7698	0.0303	0.8294	0.0327	0.9006	0.0355	0.8723	0.0343	0.9383	0.0369
13	0.7114	0.0280	0.9025	0.0355	0.9724	0.0383	1.0559	0.0416	1.0227	0.0403	1.1001	0.0433
14	0.8242	0.0324	1.0456	0.0412	1.1265	0.0444	1.2232	0.0482	1.1849	0.0466	1.2745	0.0502
15	0.9450	0.0372	1.1989	0.0472	1.2917	0.0509	1.4026	0.0552	1.3586	0.0535	1.4614	0.0575
16	1.0738	0.0423	1.3624	0.0536	1.4678	0.0578	1.5938	0.0628	1.5439	0.0608	1.6606	0.0654
17	1.2106	0.0477	1.5359	0.0605	1.6548	0.0652	1.7969	0.0707	1.7406	0.0685	1.8722	0.0737
18	1.3552	0.0534	1.7195	0.0677	1.8526	0.0729	2.0117	0.0792	1.9487	0.0767	2.0960	0.0825
19	1.5077	0.0594	1.9130	0.0753	2.0611	0.0811	2.2380	0.0881	2.1681	0.0854	2.3319	0.0918
20	1.6679	0.0657	2.1163	0.0833	2.2802	0.0898	2.4759	0.0975	2.3986	0.0944	2.5798	0.1016
21	1.8358	0.0723	2.3294	0.0917	2.5098	0.0988	2.7252	0.1073	2.6402	0.1039	2.8395	0.1118
22	2.0112	0.0792	2.5521	0.1005	2.7497	0.1083	2.9857	0.1175	2.8927	0.1139	3.1110	0.1225
23	2.1941	0.0864	2.7843	0.1096	3.0000	0.1181	3.2574	0.1282	3.1560	0.1243	3.3941	0.1336
24	2.3844	0.0939	3.0260	0.1191	3.2603	0.1284	3.5401	0.1394	3.4300	0.1350	3.6887	0.1452
25	2.5821	0.1017	3.2769	0.1290	3.5307	0.1390	3.8336	0.1509	3.7146	0.1462	3.9946	0.1573
26	2.7869	0.1097	3.5370	0.1393	3.8110	0.1500	4.1379	0.1629	4.0096	0.1579	4.3117	0.1698
27	2.9989	0.1181	3.8062	0.1499	4.1010	0.1615	4.4528	0.1753	4.3149	0.1699	4.6399	0.1827
28	3.2178	0.1267	4.0843	0.1608	4.4007	0.1733	4.7782	0.1881	4.6303	0.1823	4.9789	0.1960
29	3.4437	0.1356	4.3712	0.1721	4.7098	0.1854	5.1138	0.2013	4.9558	0.1951	5.3287	0.2098
30	3.6763	0.1447	4.6667	0.1837	5.0282	0.1980	5.4595	0.2149	5.2911	0.2083	5.6891	0.2240
31	3.9156	0.1542	4.9708	0.1957	5.3559	0.2109	5.8152	0.2289	5.6361	0.2219	6.0598	0.2386
32	4.1615	0.1638	5.2832	0.2080	5.6926	0.2241	6.1807	0.2433	5.9907	0.2359	6.4408	0.2536
33	4.4139	0.1738	5.6039	0.2206	6.0381	0.2377	6.5559	0.2581	6.3546	0.2502	6.8318	0.2690
34	4.6725	0.1840	5.9326	0.2336	6.3924	0.2517	6.9405	0.2732	6.7278	0.2649	7.2326	0.2847
35	4.9374	0.1944	6.2693	0.2468	6.7552	0.2660	7.3343	0.2888	7.1099	0.2799	7.6431	0.3009
36	5.2083	0.2051	6.6138	0.2604	7.1263	0.2806	7.7372	0.3046	7.5010	0.2953	8.0632	0.3174
37	5.4852	0.2160	6.9658	0.2742	7.5057	0.2955	8.1491	0.3208	7.9007	0.3111	8.4925	0.3343
38	5.7679	0.2271	7.3253	0.2884	7.8931	0.3108	8.5696	0.3374	8.3089	0.3271	8.9308	0.3516
39	6.0562	0.2384	7.6920	0.3028	8.2883	0.3263	8.9986	0.3543	8.7254	0.3435	9.7381	0.3692
40	6.3501	0.2500	8.0659	0.3176	8.6912	0.3422	9.4360	0.3715	9.1501	0.3602	9.8340	0.3872

THROTTLE POSITION SENSOR (TPS)

The following models use a throttle position sensor (TPS):

- 500 XC SP
- 600 HO Carbureted (All Models)
- 600 HO CFI (All Models)
- 700 HO CFI (All Models)

The TPS is located on the carburetor rack (carbureted engines) or on the throttle body (CFI engines). The TPS is set at the time of manufacture and should only require adjustment when:

- When the TPS is replaced.
- When the carburetor rack or throttle body is replaced or adjusted.
- The TPS is suspected of being set incorrectly as part of troubleshooting.

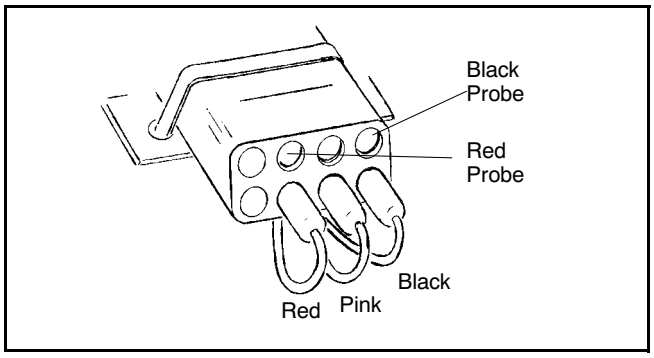
The TPS test tool, PN 2201519, is used to accurately adjust the TPS return signal settings.

TPS Test Tool Setup

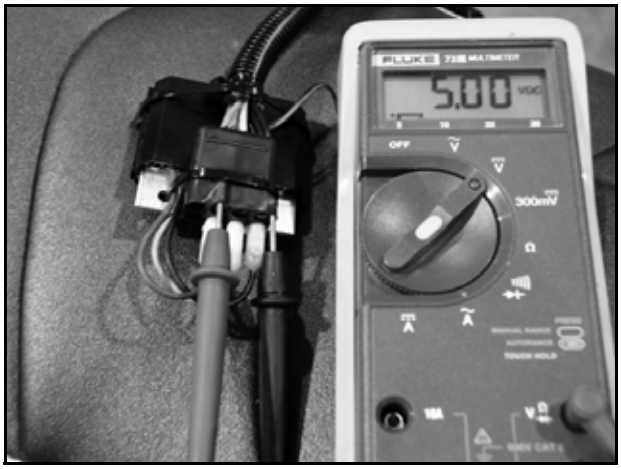
The test tool must be always be used to inspect the TPS on carbureted engines. On CFI models, either the test tool or Digital Wrench can be used to test the TPS.

NOTE: Signal readings can be affected if the 9 volt battery is weak. Always verify the battery is in good condition.

1. Set the multimeter to read Vdc.
2. Verify the 9 volt battery condition by inserting the black multimeter probe into the black wire terminal and the red multimeter probe into the pink wire terminal. Voltage should read 4.99 to 5.01 Vdc. Use a new battery if voltage is below 4.99 Vdc.



3. Connect the test tool to the TPS on the carburetor or throttle body.



NOTE: Always disconnect the 9 volt battery when tool is not in use.

Using the TPS Test Tool

1. Remove the wiring harness connector from the TPS.
2. Verify the throttle cable is not kinked and the throttle flipper is closed.
3. Connect the test tool to the TPS.
4. Insert the black multimeter probe into the black terminal port, then insert the red multimeter probe into the yellow terminal port.
5. Reference the specifications to determine if the TPS requires adjustment or replacement.

TPS Setting Specifications

ENGINES	VOLTAGE SETTINGS
Carbureted Engines	4.00 +/- 0.1 Vdc @ WOT
CFI Engines	0.95 +/- 0.01 Vdc @ Idle

6. To verify the TPS is sending a linear signal, slowly move the throttle flipper from the closed to WOT position, then back down to the closed position.
7. The voltage readings displayed on the multimeter should rise and fall without erratically jumping from high to low.

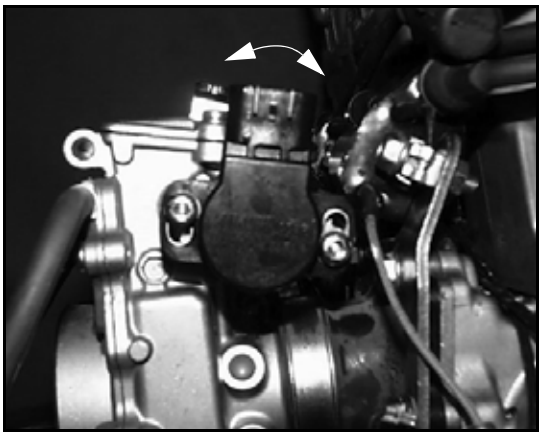
NOTE: The multimeter display may change scales and show O.L. momentarily when throttle flipper is moving.

8. If the signal readings are erratic, replace the TPS sensor.

TPS Adjustment - Carbureted Models

NOTE: Always verify the engine idle speed is set at engine operating temperature and the throttle cable freeplay is set to 0.10″ - 0.30″.

1. Connect the TPS test tool to the TPS.
2. Slightly loosen the screws securing the TPS to carburetor body.
3. Have an assistant hold the throttle flipper in the WOT position.
4. Turn the TPS **clockwise** to decrease voltage, or **counterclockwise** to increase voltage.
5. Carefully tighten the TPS screws when the WOT Vdc is 4.00Vdc.



TPS Adjustment - CFI Models - Using Digital Wrench

Either Digital Wrench or the TPS Test Tool can be used to see the TPS return signal voltage, set the TPS baseline and set the idle gap on CFI models.

To use Digital Wrench, follow these steps.



1. Click on the TOOLBOX icon.
2. Click on “TPS INITIALIZATION”
3. Follow the steps and procedures displayed on the screen.

TPS Baseline Adjustment - CFI Models

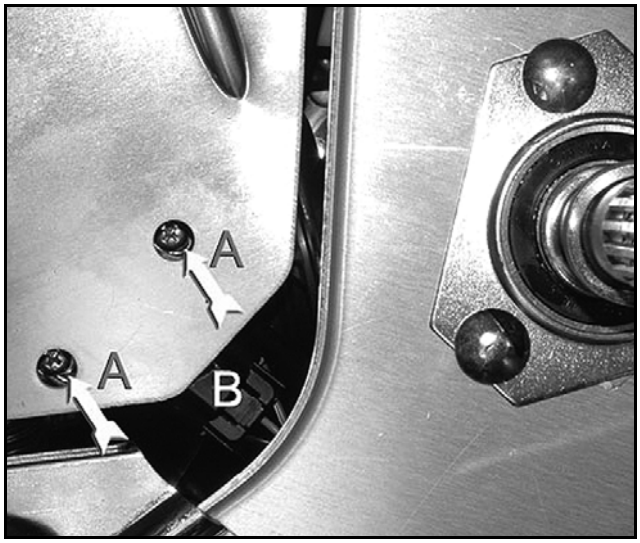
NOTE: The TPS baseline and idle speed adjustments must be performed whenever the TPS is moved or replaced.

1. Remove the drive belt, driven clutch, airbox, and adapter plate.
2. If the TPS requires replacement, remove the throttle body and replace the TPS.

NOTE: If only verifying the TPS voltage setting, the throttle body can remain on the engine.

3. The TPS fasteners can be accessed through a set of access holes in the TPS guard if adjustment is required.
4. Unplug the TPS connector (B), and connect the TPS test tool.

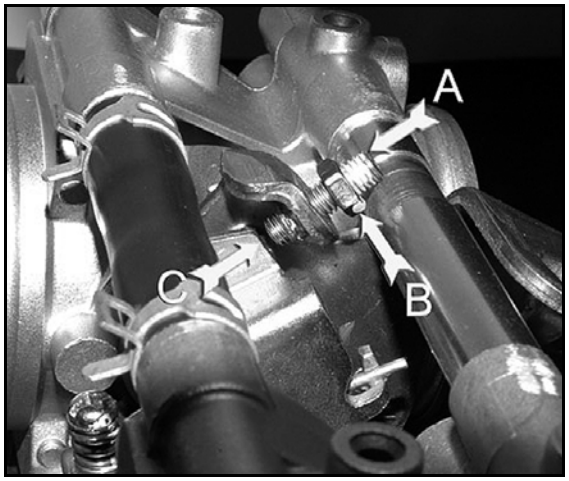
NOTE: The guard may need to be “flexed” to align the holes with the TPS fasteners.



- A = TPS Fasteners
- B = TPS Harness Connector

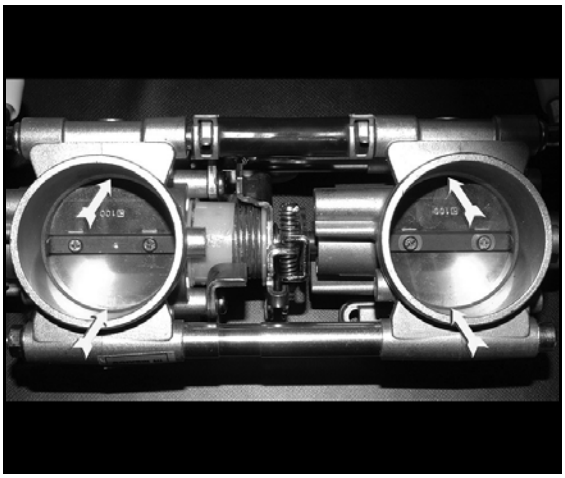
5. Remove the throttle cable barrel from the throttle flipper.

6. Loosen the idle speed screw until the screw no longer touches the tab and the throttle plates are completely closed.

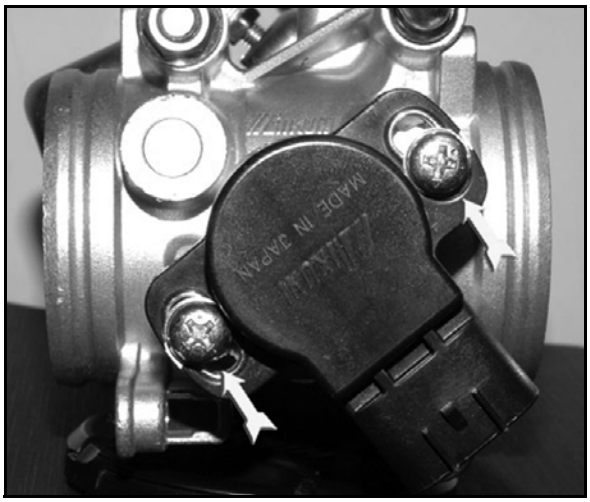


- A = Idle Speed Screw
- B = Lock Nut
- C = Throttle Stop

7. Snap throttle plates 2 to 3 times to ensure plates are completely closed.



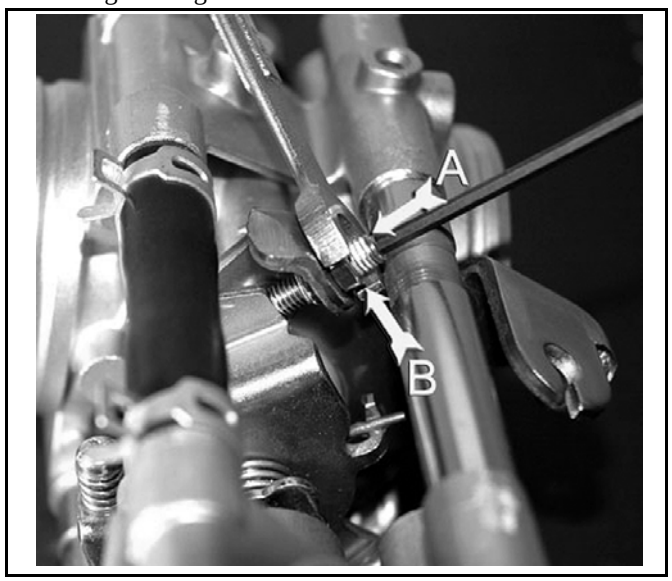
8. Using the TPS test tool, verify the TPS is set to 0.70 +/- 0.01 Vdc.
9. To adjust the TPS base-line, slightly loosen the screws, then slowly turn the TPS clockwise or counter-clockwise to adjust the voltage.



10. Carefully tighten the screws to 31 In.Lbs. (3.5 Nm) when the voltage is 0.70 +/- 0.01 Vdc.
11. Open and close the throttle plate 2 - 3 times and verify the voltage is still within specification.

TPS Idle Speed Adjustment - CFI Models

1. Verify the TPS voltage is 0.70 +/- 0.01 Vdc with the throttle plates closed.
2. Slowly turn the idle speed adjustment screw (A) clockwise until the voltage displayed on the multi meter reads 0.95 +/ - 0.1 Vdc.
3. Carefully tighten the lock nut (B) while maintaining the voltage setting.



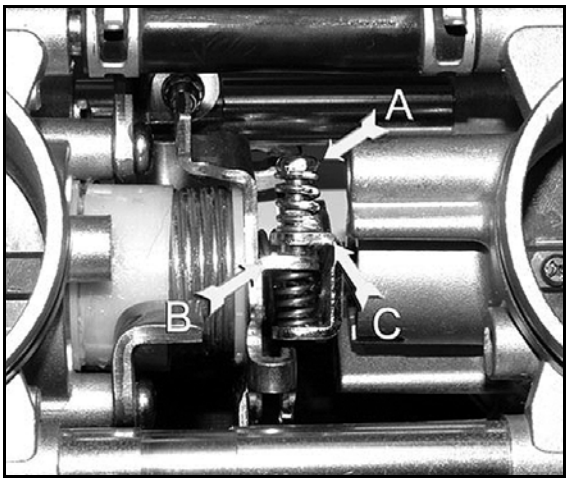
4. Reinstall the throttle cable, then install the throttle body back on to the engine.

Throttle Plate Synchronization

The throttle plates are synchronized at the time of throttle body manufacture. Adjustment should never be required unless it is believed the plates are out of sync.

To adjust throttle plate synchronization, follow these steps:

1. Perform the TPS Baseline Adjustment. The TPS must be set to specification.
2. Carefully back the synchronization screw out so it no longer touches the tab, but do not remove the screw or the spring.
3. Verify the TPS voltage is set to 0.70 +/- 0.01 Vdc. If it is not, re-perform the baseline adjustment.



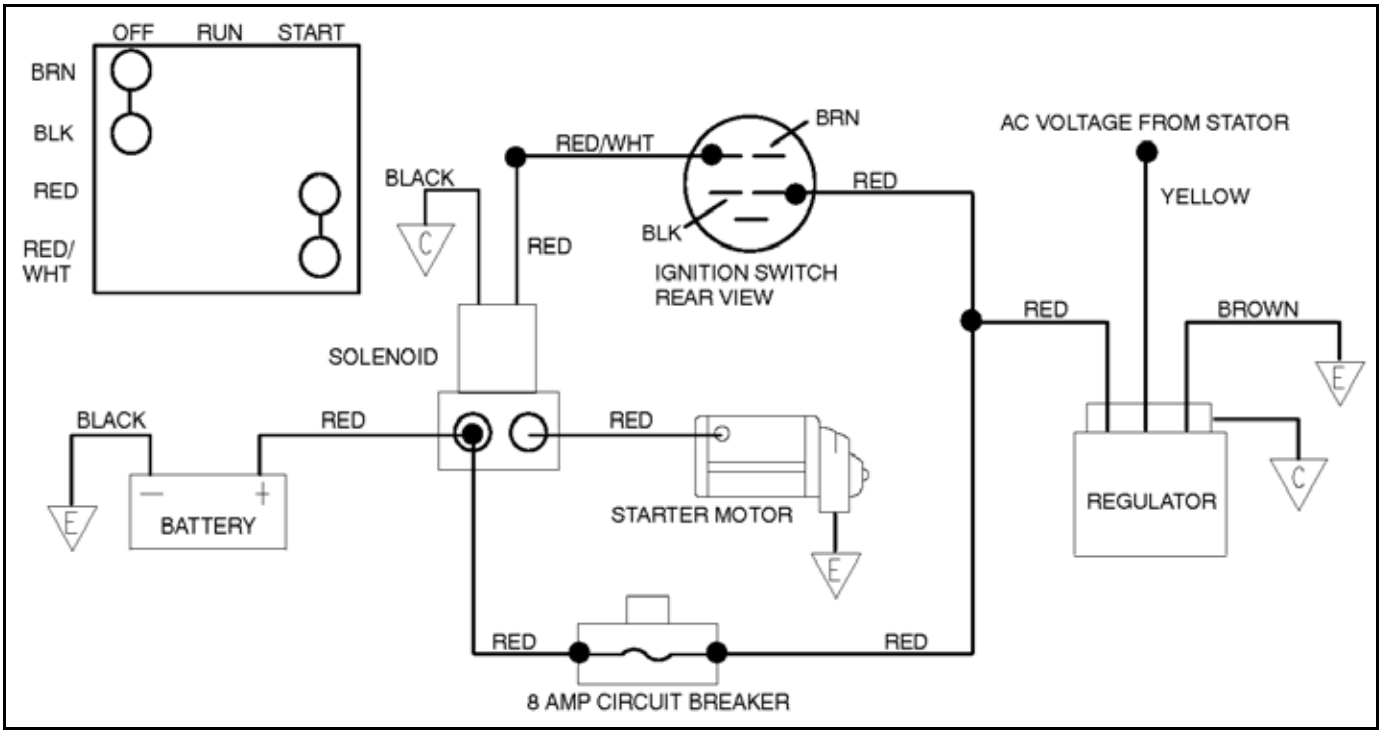
- A = Synchronization Screw
- B = Throttle Arm Tab
- C = Screw Mount

4. Slowly turn the synchronization screw inwards until the instant the voltage on the multimeter changes. Back the screw out so the voltage reads 0.70 +/- 0.01 Vdc.

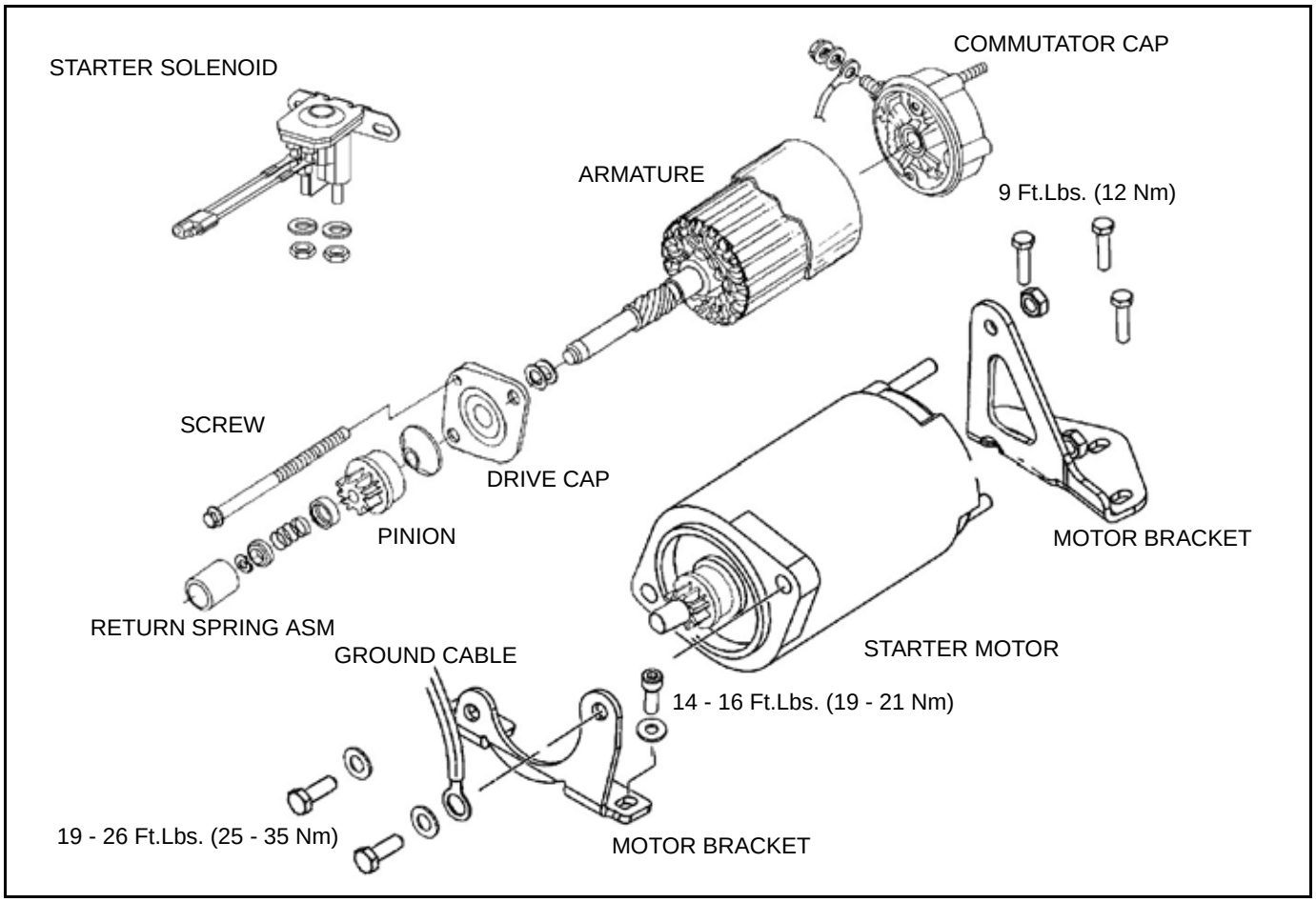
NOTE: When turning the synchronization screw, do not push the screwdriver with enough force to move the throttle cable cam. Doing so will affect the TPS voltage reading on the multimeter.

ELECTRIC START - GEN II / EDGE

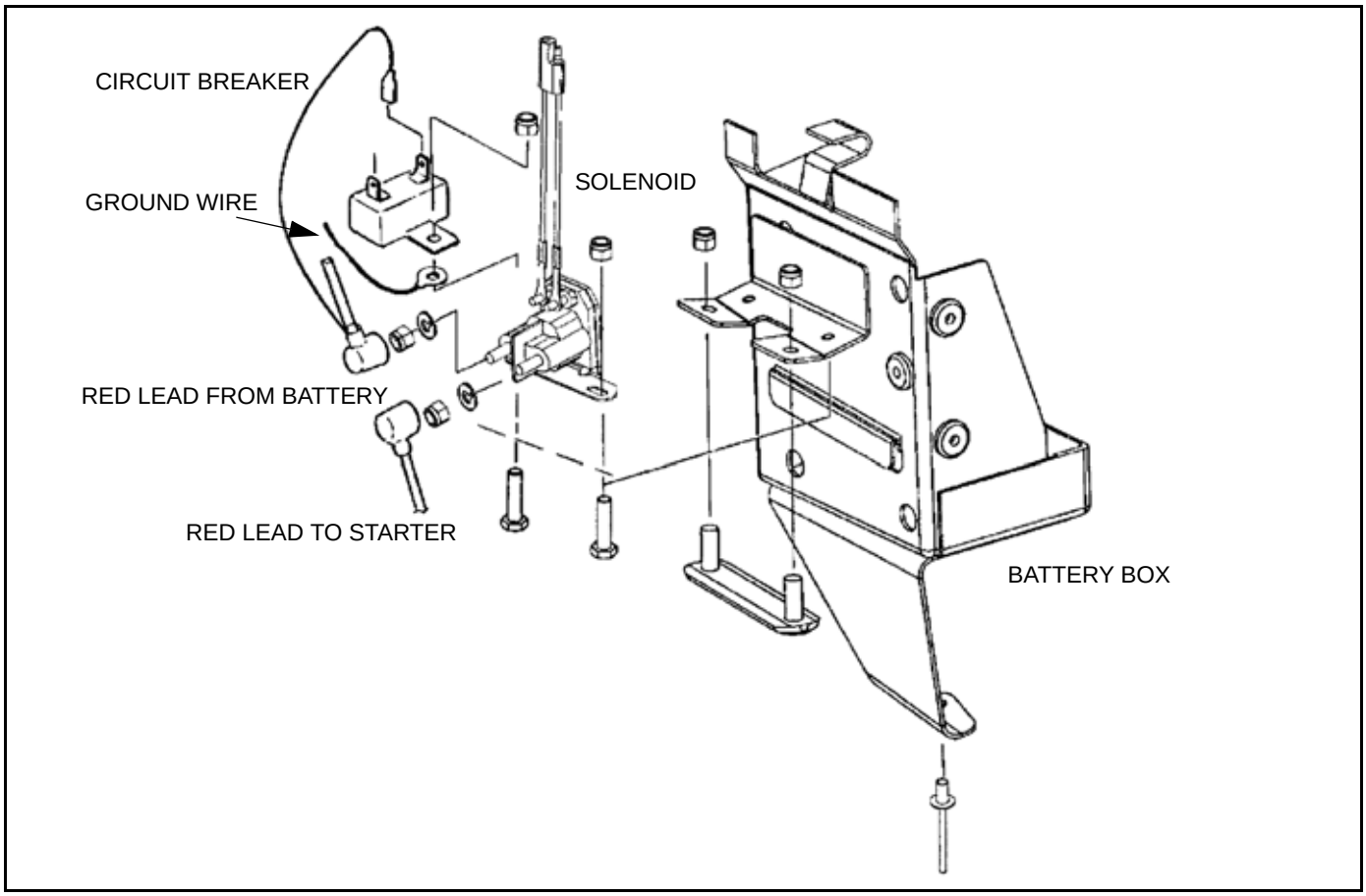
System Schematic



Starter Motor Assembly (Typical)



Battery Box


CIRCUIT BREAKER
GROUND WIRE
SOLENOID
RED LEAD FROM BATTERY
RED LEAD TO STARTER
BATTERY BOX

Dynamic Testing

NOTE: Be sure the engine crankshaft turns freely before proceeding. Use a digital multimeter during tests.

Test battery voltage. Is the battery voltage equal to or greater than 12.8 Vdc?	NO	Remove battery, test and/or service. Install a fully charged shop battery to continue the test and continue with left column
YES		
Disconnect two-pin harness from starter solenoid. Connect black multimeter probe to the engine or ground, then the red probe to the red harness wire at solenoid. Rotate ignition key to the start position. Meter should read battery voltage. Does it?	NO	With black tester lead on ground, check for voltage at large relay terminal, circuit breaker in and out terminals, and across both sides (red and red/white) of the ignition switch with switch on start. Repair or replace any defective parts.
YES		
Reconnect the solenoid harness. Connect black probe to battery positive terminal and red probe to solenoid end of battery to solenoid cable. (B) Page 13.9. Turn key to start position. The reading must be less than.1V DC. Is it?	NO	Clean battery to solenoid cable ends or replace cable.
YES		
Connect black tester lead to solenoid end of solenoid to starter cable and red tester lead to starter end of same cable. (D) Page 13.9. Turn key to start position. The reading must be less than.1V DC. Is it?	NO	Replace starter solenoid.
YES		
Connect black tester lead to starter frame. Connect red tester lead to battery negative (-) terminal. (E) Page 13.9. Turn key to start position. The reading should be less than.1V DC. Is it?	NO	Clean ends of engine to battery negative cable or replace cable.
If all these tests indicate a good condition, yet the starter still fails to turn, or turns slowly, the starter must be remove for static testing and inspection.		

Static Testing

1. Remove starter motor and disassemble. (See page 11.11 for exploded view) Mark end covers and housing for proper reassembly.
2. Remove pinion retaining snap ring, spring and pinion gear.
3. Remove brush end bushing dust cover.
4. Remove housing through bolts.
5. Slide brush end frame off end of starter.

NOTE: The electrical input post must stay with the field coil housing.

6. Slide positive brush springs to the side, pull brushes out of their guides and remove brush plate.
7. Clean and inspect starter components.

NOTE: Some cleaning solvents may damage the insulation in the starter. Care should be exercised when selecting an appropriate solvent. The brushes must slide freely in their holders. If the commutator needs cleaning, use only an electrical contact cleaner and/or a non-metallic grit sandpaper. Replace brush assembly when worn to 5/16, (.8 cm) or less.

Starter Housing / Field Coil Testing

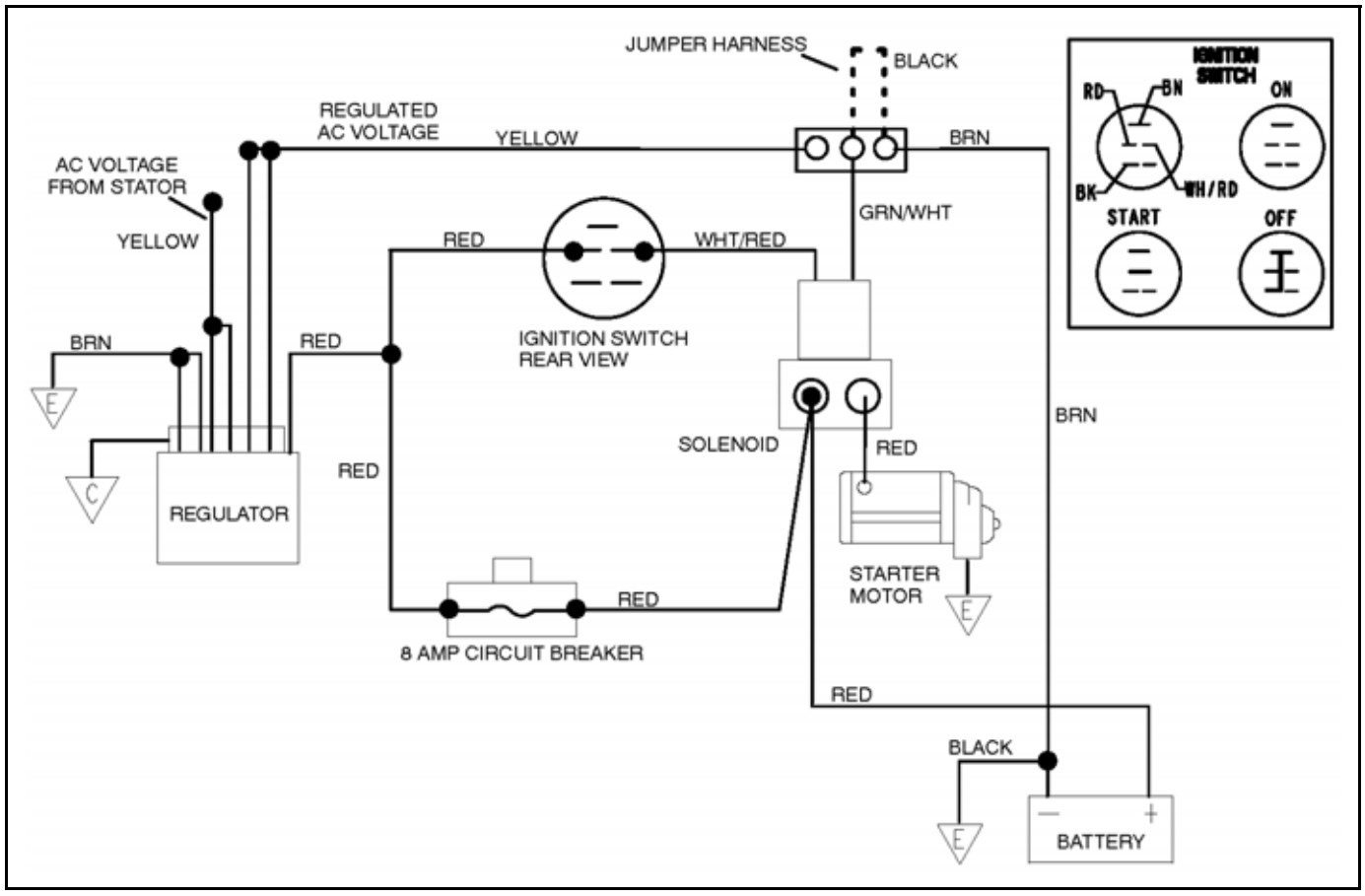
1. Using a digital multimeter, measure resistance between starter input terminal and insulated brushes. The reading should be.3 ohms or less.
2. Measure resistance between insulated brushes and field coil housing. The reading should be infinite.
3. Inspect insulated brush wire and field coil insulation for damage. Repair or replace components as required.

Armature Testing

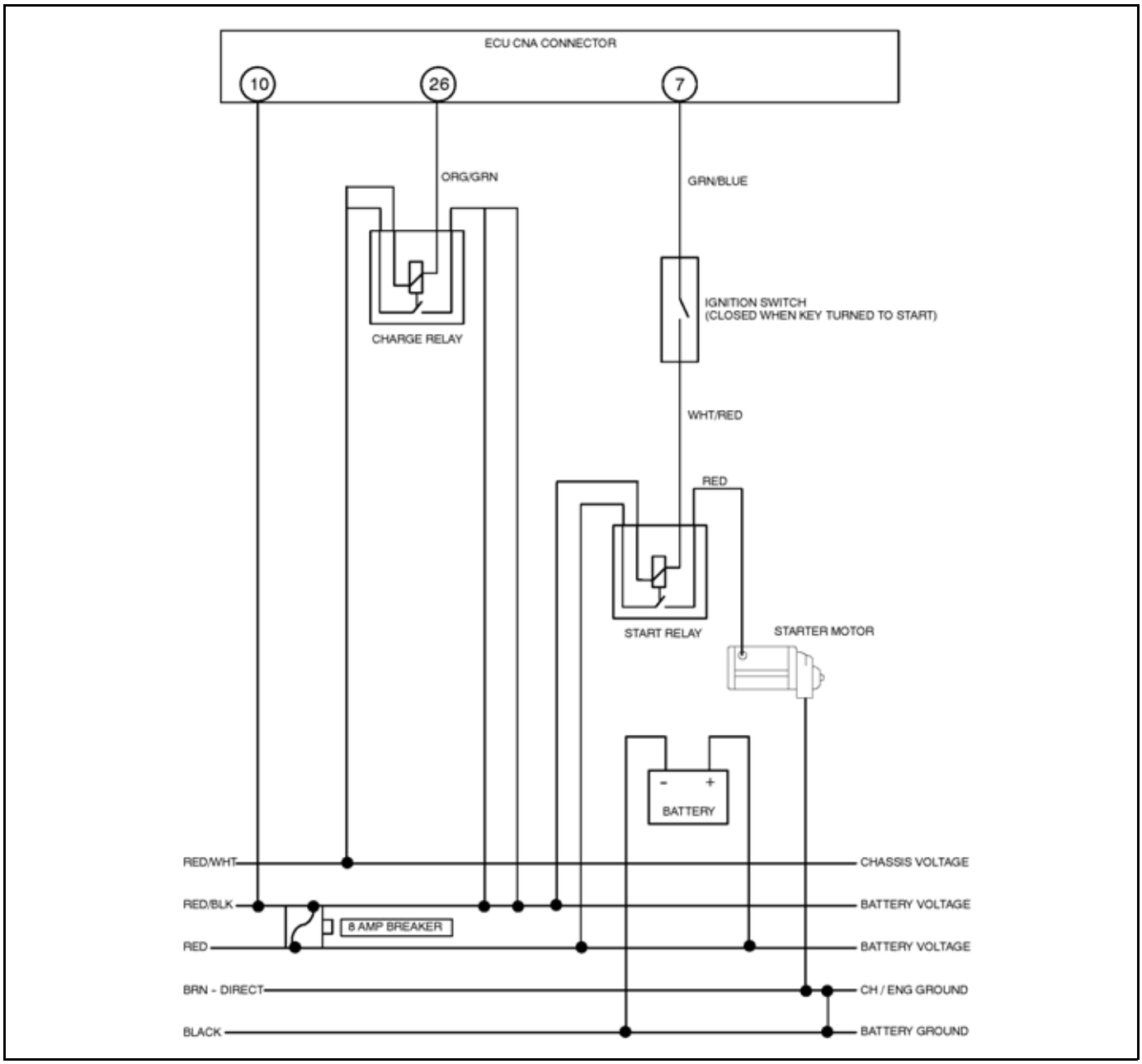
1. Using a digital multimeter, measure resistance between each of the segments of the commutator. The reading should indicate.3 ohms or less.
2. Measure resistance between commutator and armature shaft. Reading should be infinity.
3. Place armature in a growler. With the growler on, position a hacksaw blade lengthwise 1/8, (.03 cm) above armature coil laminates. Rotate armature 360_. If hacksaw blade is drawn to the armature on any pole, the armature is shorted and must be replaced.

ELECTRIC START - IQ CARBURETED / CFI

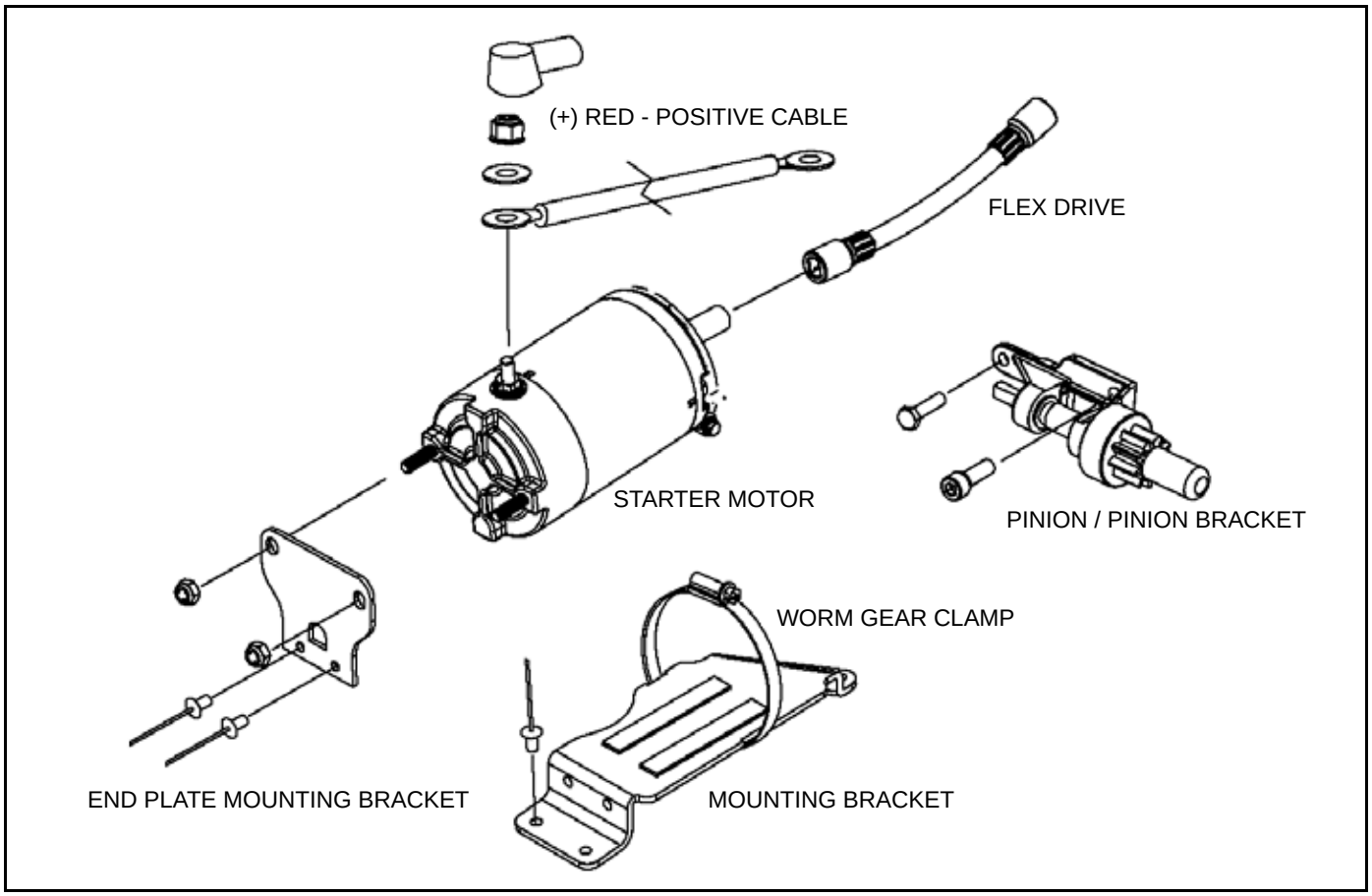
System Schematic - 600 HO Carbureted



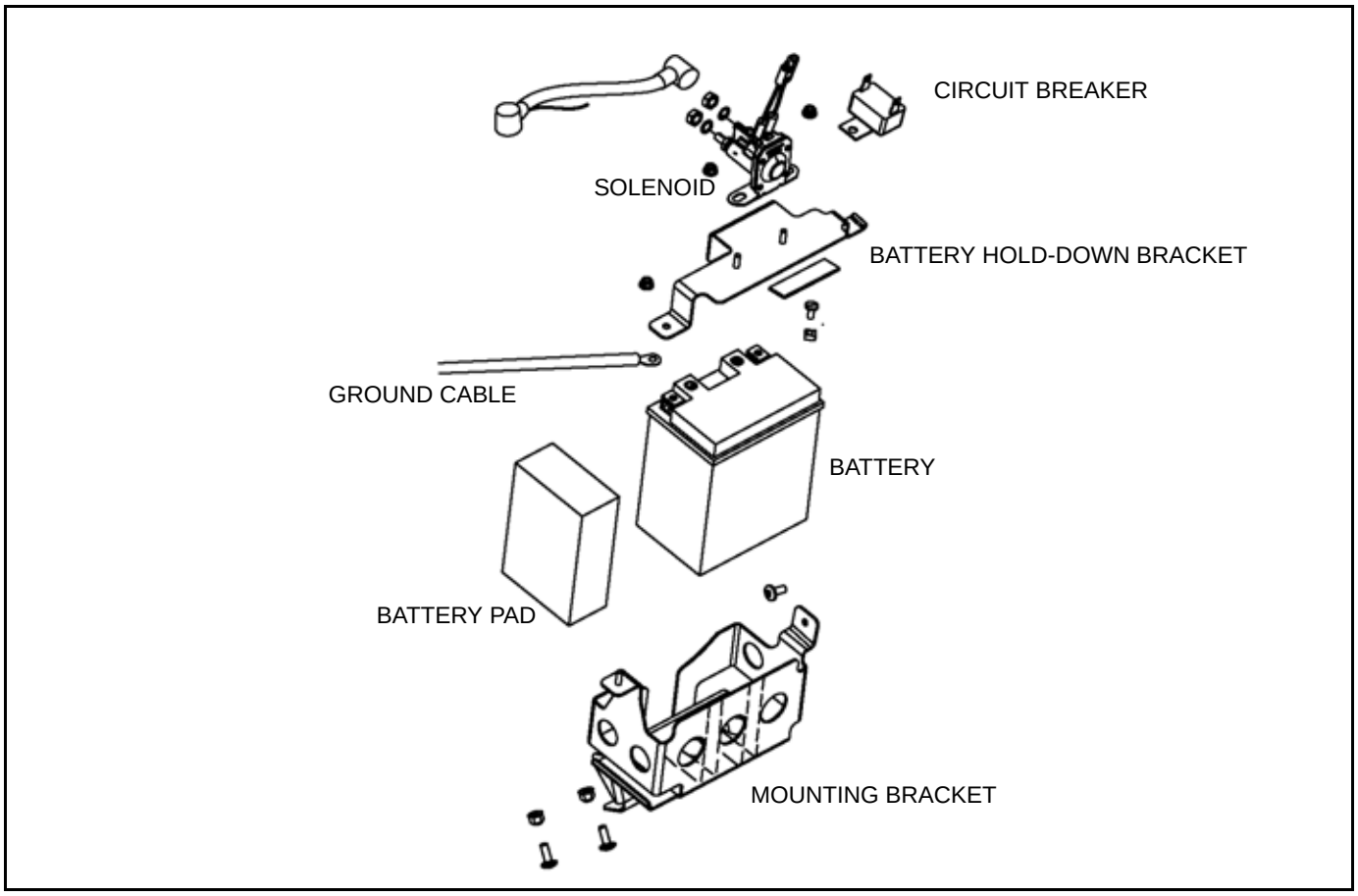
System Schematic - 600 / 700 CFI



Starter Motor / Flex Drive Assembly



IQ Battery Box Assembly



CLEANFIRE™ FUEL INJECTION

System Overview

The 2007 Cleanfire™ fuel Injection system is a battery-less engine management, capacitive discharge ignition, four fuel injector engine management system.

System components include:

- ECU: The ECU controls the ignition / fuel injection angles, chassis / battery relays, and supplies the MFD gauge with tachometer / water temp. / PERC / HOT / DET / diagnostic information.
- Stator: The stator consists of a lighting charge coil, ignition exciter coil, fuel injector charge coil and two independent external crank position (two and five pulse) coils.
- Flywheel: The CFI flywheel houses the magnets for energizing the stator windings as well as two independent encoder ribs. The set of two encoder ribs are spaced 180 degrees apart from each other and provide RPM information required at engine start up. A set of five encoder ribs is responsible for crank angle detection, speed, and direction information.
- Regulator / Rectifier: Responsible for converting Vac to Vdc for the chassis and battery (electric start) circuits. Regulates voltage to 14.5 Vdc. Also supplies fuel injector “boost” power when engine RPM is 700 RPM or less.
- Capacitor: The capacitor suppresses voltage spikes and ensures consistent voltage throughout the chassis (RED/WHT) circuit.
- Chassis Relay: The chassis relay is activated by the ECU at approximately 950 RPM. Below 950 RPM, all power supplied by the regulator / rectifier (RED circuit) is used to power the ECU and fuel pump.
- Ignition Coils: Provide ignition energy to each spark plug. Both coils are fired at the same time.
- Fuel Injectors: CFI uses one set of full load injectors (located in the crankcase), and one set of part load injectors (located in each cylinder’s transfer port). The full load injectors are always used, while the part load injectors are used during mid to high RPM transitions.
- Detonation Sensor: Located on the cylinder head, the detonation sensor transforms internal acoustic information in a signal the ECU uses to determine the amount of engine knock.
- Exhaust Valve Solenoid: Activated by the ECU, the solenoid controls the VES venting. When powered, the vents are closed, keeping the exhaust valves down. When power is removed, the exhaust valves are allowed to open.
- Throttle Position Sensor (TPS): The TPS relays the position of the throttle plates (operator throttle input) to the ECU.
- Coolant Temperature Sensor: Relays the engine temperature to the ECU.
- Exhaust Temperature Sensor: Relays the temperature of the exhaust pipe to the ECU.
- Temperature / Barometric Air Pressure (T-BAP) Sensor: Relays the current intake air temperature and ambient air pressure to the ECU. The sensor is located on the airbox.
- Vehicle Speed Input: The ECU monitors the vehicle speed supplied by the vehicle speed sensor.
- Fuel Pump: Supplies fuel to the fuel injectors. Power to the fuel pump is supplied by the regulator / rectifier.
- Diagnostic Connector: The ECU can communicate with the Polaris Digital Wrench software and can be re-flashed, monitored and will display trouble codes.

Diagnostic Trouble Codes (DTCs)

2007 CFI Diagnostic Trouble Codes

TROUBLE CODE	P-CODE	MFD BLINK CODE	DESCRIPTION
Throttle Position Sensor Unrealistic Transition	P0120	1	TPS signal changes too rapidly to be correct. Can be caused by faulty connections or a faulty TPS.
Throttle Position Sensor Voltage High	P0123		TPS signal is above 4.39 Vdc. Can be caused by a faulty wire connection or faulty TPS.
Throttle Position Sensor Voltage Low	P0122		TPS signal is below 0.7 Vdc. Can be caused by a faulty wire connection or faulty TPS.
Engine Coolant Temperature Sensor Voltage High	P0118	2	Sensor signal is above 4.8 Vdc. Can be caused by a faulty wire connection or faulty temperature sensor.
Engine Coolant Temperature Sensor Voltage Low	P0117		Sensor signal is below 0.1 Vdc. Can be caused by a faulty wire connection or faulty temperature sensor.
Intake Air Temperature Circuit Voltage High	P0113	3	Sensor signal is above 4.9 Vdc. Can be caused by a faulty wire connection or faulty TBAP.
Intake Air Temperature Circuit Voltage Low	P0112		Sensor signal is below 0.19 Vdc. Can be caused by a faulty wire connection or faulty TBAP.
Barometric Pressure Sensor Voltage High	P0108	4	Sensor signal is above 3.23 Vdc. Can be caused by a faulty wire connection or faulty TBAP.
Barometric Pressure Sensor Voltage Low	P0107		Sensor signal is below 1.25 Vdc. Can be caused by a faulty wire connection of faulty TBAP.
Exhaust Temperature Sensor Circuit Voltage High	P0546	5	Sensor signal is above 4.9 Vdc for at least 2 minutes and the engine has been running at or above 3000 RPM.
Exhaust Temperature Sensor Circuit Voltage Low	P0545		Sensor signal is below 0.06 Vdc for at least 2 minutes and the engine has been running at or above 3000 RPM.
Detonation Sensor Circuit Voltage High	P0328	6	Engine speed is above 6000 RPM and the sensor signal is above 4.3 Vdc for at least 2 seconds.
Detonation Sensor Circuit Voltage Low	P0327		Engine speed is above 6000 RPM and the sensor signal is below 1.23 Vdc for at least 2 seconds.
Exhaust Valve Solenoid Circuit Malfunction	P1477	8	Solenoid control circuit is OPEN. Can be caused by faulty wiring, solenoid, or ECU.
MAG Part Load Injector Circuit Open	P0261	7	OPEN circuit or short to ground. Can be caused by faulty wiring, injector, stator or ECU.
MAG Full Load Injector Circuit Open	P1261		
PTO Part Load Injector Circuit Open	P0264		
PTO Full Load Injector Circuit Open	P1264		
Fuel Injector Voltage Too High	P2148		Engine is running, but the injector voltage is above the acceptable limit. Can be caused by faulty wiring, ECU or stator.
Fuel Injector Voltage Too Low	P2147		Engine is running, but the injector voltage is below the acceptable limit. Can be caused by faulty wiring, ECU or stator.
Vehicle Speed Sensor No Signal	P0500	Steady LED	Sensor has given a speed that is not possible with given engine conditions. Can be caused by a faulty sensor, wiring or ECU.
MAG Ignition Coil Circuit Malfunction	P0351	9	Failure within the primary circuit. Can be caused by faulty wiring, ignition coil, or ECU.
PTO Ignition Coil Circuit Malfunction	P0352		
5 Tooth CPS Signal Missing	P0335	10	Engine is running, but there is no signal from the 5 tooth CPS. Can be caused by a faulty stator, wiring or ECU.

2007 CFI Diagnostic Trouble Codes

TROUBLE CODE	P-CODE	MFD BLINK CODE	DESCRIPTION
5 Tooth CPS Signal Intermittent	P0336	Steady LED	Engine is running, but the pulses from the 5 tooth CPS are incorrect. Can be caused by a faulty stator, wiring harness or ECU.
5 VDC Sensor Supply Voltage Low	P0643		Sensor supply voltage is below an acceptable limit. Can be caused by faulty wiring or ECU.
Chassis Voltage High	P0563		System voltage is too high. Can be caused by faulty wiring or regulator / rectifier.
Chassis Voltage Low	P0562		System voltage is too low. Can be caused by a faulty wiring or regulator rectifier.
Ignition Voltage Circuit Malfunction	P0350		Engine is running but a problem is found with the ignition coil power circuit. Can be caused by faulty wiring or ECU.
2 Tooth CPS Signal Missing	P0385		Engine is running and there is a signal from the 5 tooth CPS, but not the 2 tooth CPS sensor. Can be caused by faulty wiring, stator or ECU.
Chassis Relay Coil Open Circuit	P1611		The chassis relay control circuit is open. Can be caused by faulty wiring or a faulty relay.

MFD Blink Codes

The check engine LED will display a blink code whenever the ECU determines there is a problem with one or more of the sensors. Use Digital Wrench to troubleshoot, fix and clear the codes.

When a blink code is displayed, the CHECK ENGINE light will illuminate for 1/2 second “on” and 1/2 second “off” with a 1 second “off” interval between close.

DTC Troubleshooting

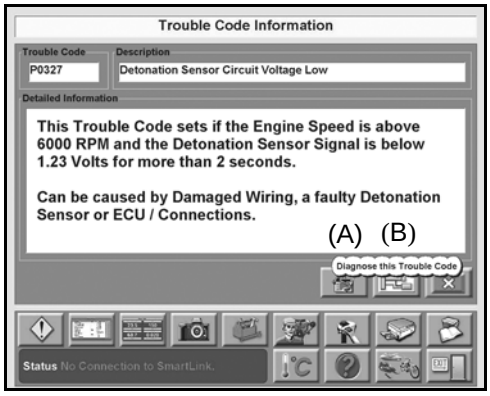
Always use the Digital Wrench diagnostic software program to troubleshoot DTCs, MFD blink codes, and overall performance problems.

Digital Wrench can be used to display trouble codes and offers guided diagnostics. Guided diagnostics allows the technician to perform diagnostic checks in an attempt to isolate the root problem.

1. To access trouble codes, click on the “!” button. If any codes are listed, select a code to proceed.

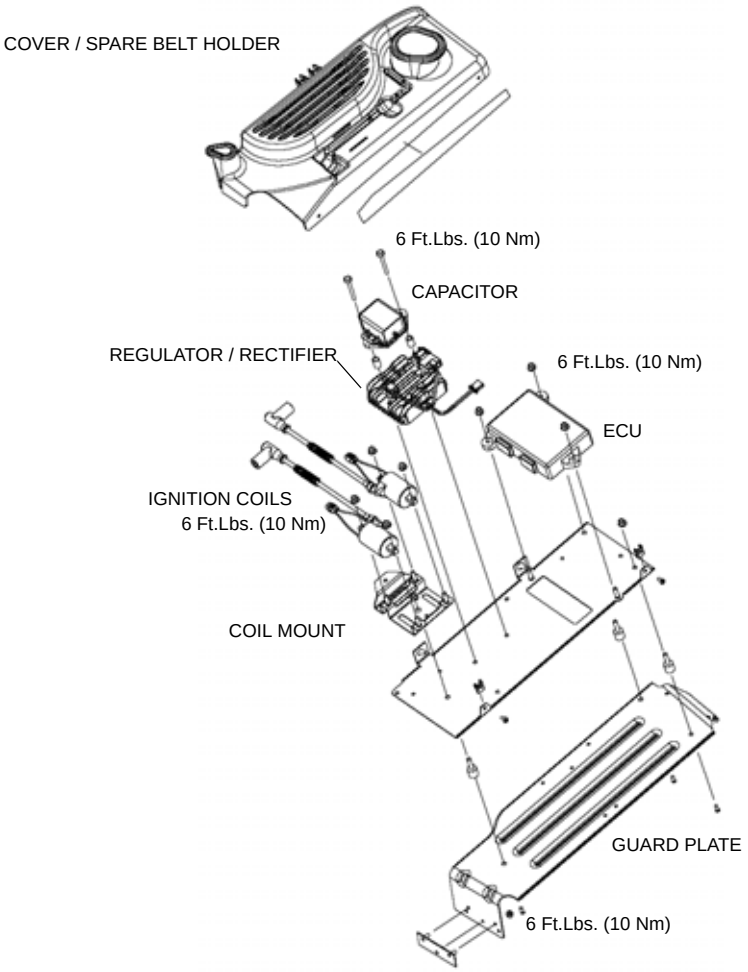


2. To access guided diagnostics, click on the “SPECIAL TESTS” (toolbox) button. Then click “DIAGNOSTIC PROCEDURES”.
3. Select a code or system in the ‘SYSTEM CHARTS” menu. A description of the DTC or system will be displayed.

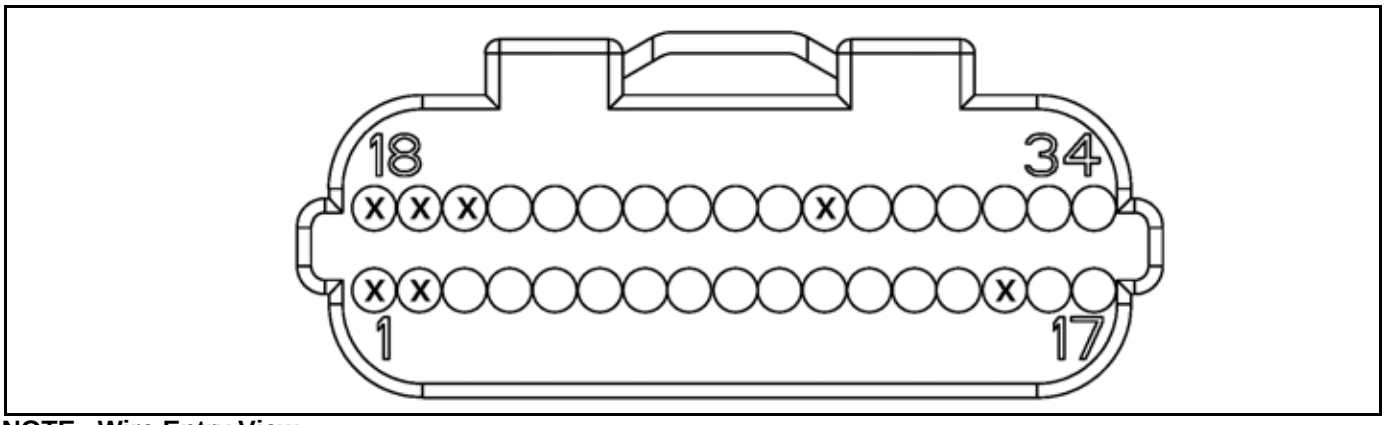


4. Click on (A) to activate guided diagnostics.
5. Click on (B) to view a wiring schematic of the component or system.
6. Click on “X” to exit the current screen.

CFI Clutch Guard Electrical Center



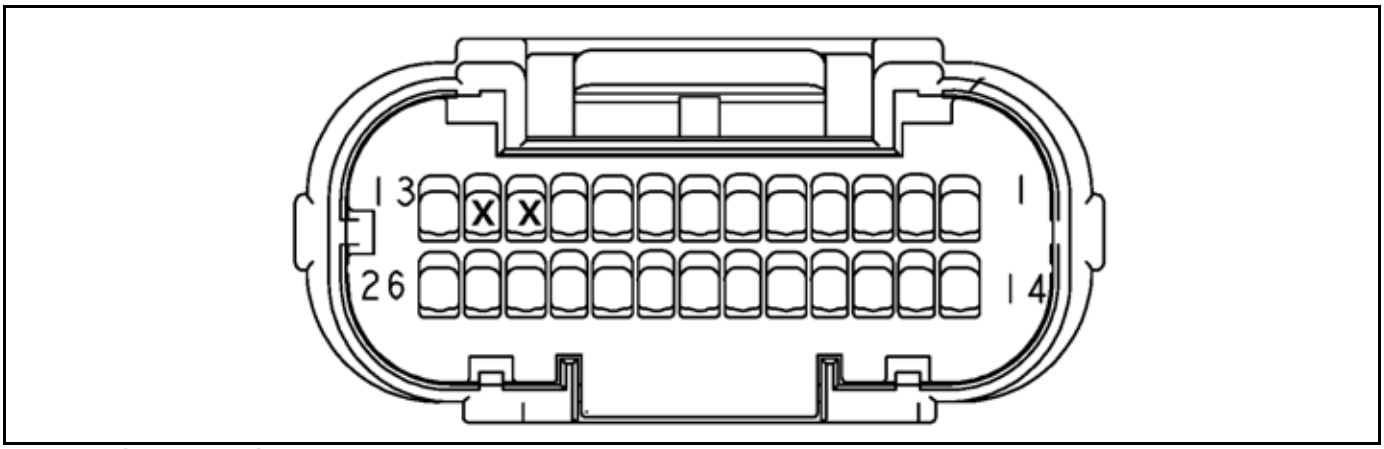
34 Pin CNA ECU Connector



NOTE: Wire Entry View

PIN	COLOR	GOES TO CONNECTOR	FUNCTION
3	RED/BLUE	SPLICE	K LINE POWER
4	ORANGE	ECU POWER	EXTERNAL POWER
5	WHITE/BLACK	EXHAUST TEMP. SENSOR	SIGNAL
6	BLUE	TBAP	AIR TEMP SIGNAL
7	GREEN/BLUE	IGNITION SWITCH	STARTER LOCKOUT
8	RED/WHITE	TBAP	5 VDC POWER SUPPLY
9	GREEN/RED	GROUND SPEED SENSOR SPLICE	SPEED SIGNAL
10	RED/BLACK	ELECTRIC START	BATTERY VOLTAGE
11	WHITE/BLUE	CHASSIS RELAY	COIL GROUND
12	RED/BLACK	THROTTLE FLIPPER SAFETY SWITCH	SOFTWARE BASED IGNITION KILL SIGNAL
13	BROWN	ECU GROUND SPLICE	ECU GROUND
14	RED/BLUE	CHASSIS / HOOD #2	WATER TEMP. SIGNAL
16	YELLOW/RED	CHASSIS / HOOD #1	TACHOMETER SIGNAL
17	ORANGE	REGULATOR / RECTIFIER	VOLTAGE BOOST POWER
21	PINK	DIAGNOSTIC	K-LINE
22	GRAY	GRAY SPLICE	MODE SELECT
23	WHITE	CHASSIS/HOOD #1	PERC LED
24	GREEN	TBAP	PRESSURE SENSOR SIGNAL
25	BLUE/WHITE	CHASSIS / HOOD #1	OVERHEAT / DET LED
26	ORANGE/GREEN	ELECTRIC START	CHARGE RELAY COIL GROUND
27	BLACK/WHITE	DIAGNOSTIC SPLICE - CHASSIS / HOOD #1	DIAGNOSTICS / CHECK ENGINE LED
29	BLACK	TETHER / IGN. SWITCH / SAFETY SLAP SWITCH	HARDWARE STOP - IGNITION KILL SIGNAL
30	BLACK/BLUE	SENSOR GROUND SPLICE #1	SENSOR GROUND
31	GRAY	LH CONTROL	PERC SIGNAL
32	RED	REGULATOR POWER SPLICE	REGULATED POWER
33	ORANGE	REGULATOR / RECTIFIER	VOLTAGE BOOST POWER
34	ORANGE	REGULATOR / RECTIFIER	VOLTAGE BOOST POWER

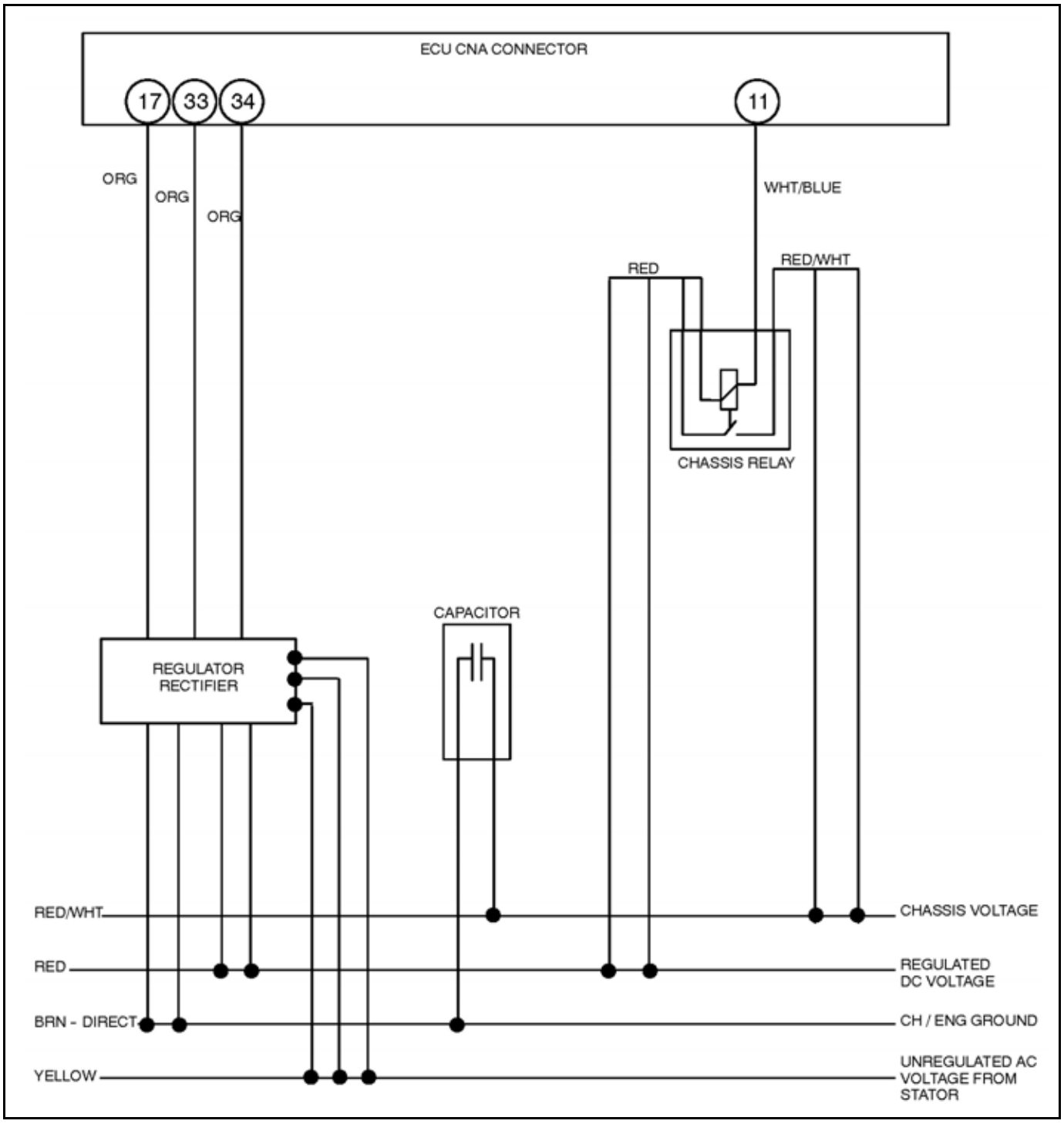
26 Pin CNB ECU Connector



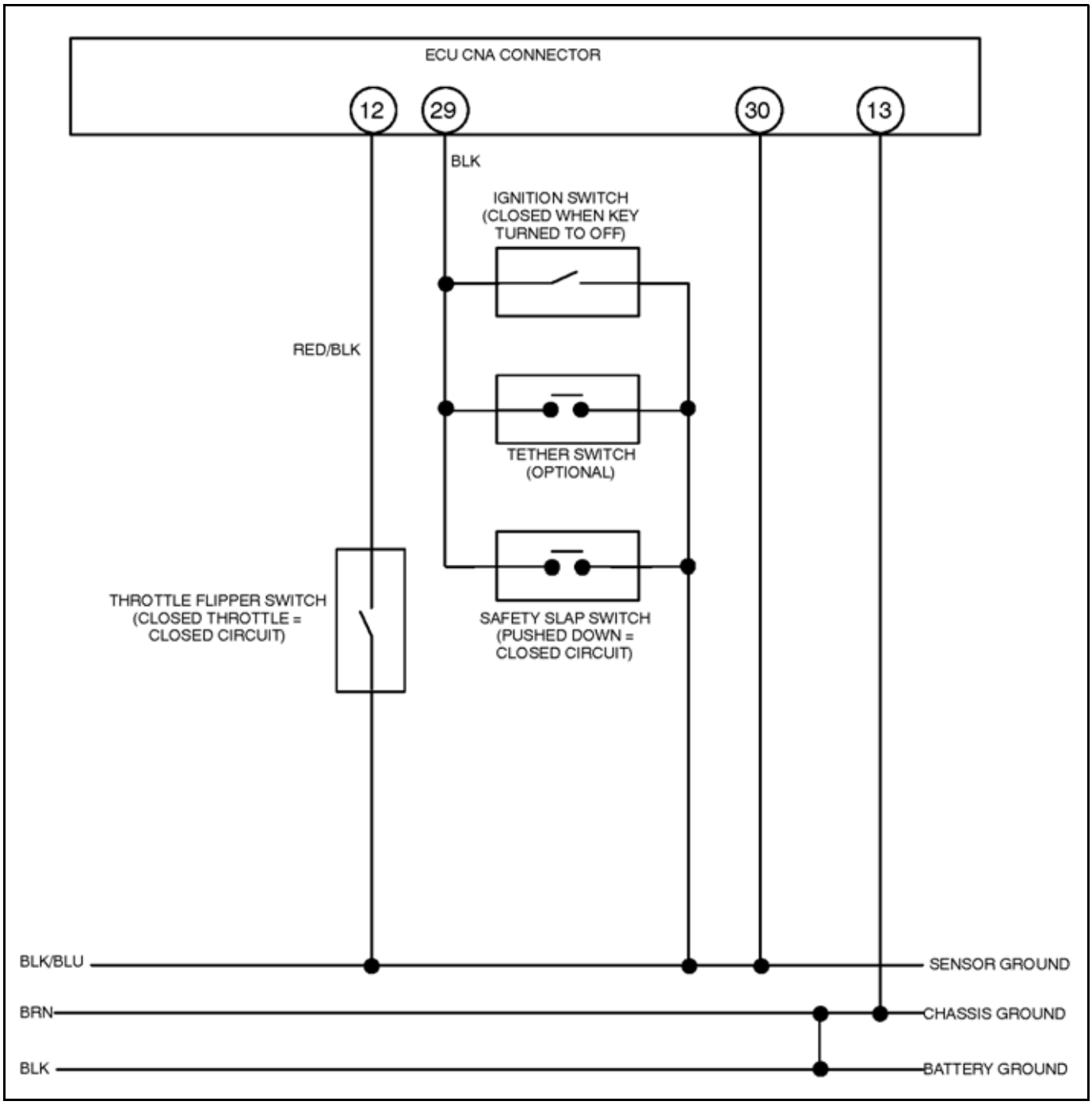
NOTE: Wire Entry View

PIN	COLOR	GOES TO CONNECTOR	FUNCTION
1	ORANGE	PTO IGNITION COIL	COIL POWER
2	BLUE / YELLOW	STATOR - FUEL INJECTOR COIL	FUEL INJECTOR POWER COIL
3	BLUE / YELLOW	STATOR - FUEL INJECTOR COIL	FUEL INJECTOR POWER COIL
4	GREEN	STATOR - CRANK POSITION SENSOR	5 TOOTH COIL SIGNAL
5	WHITE	STATOR - CRANK POSITION SENSOR	2 TOOTH COIL SIGNAL
6	YELLOW	MAG FULL LOAD INJECTOR	INJECTOR CONTROL GROUND
7	YELLOW / WHITE	MAG PART LOAD INJECTOR	INJECTOR CONTROL GROUND
8	GREEN	PTO FULL LOAD INJECTOR	INJECTOR CONTROL GROUND
9	GREEN / WHITE	PTO PART LOAD INJECTOR	INJECTOR CONTROL GROUND
10	RED / WHITE	TPS	5 VDC POWER SUPPLY
13	WHITE / YELLOW	EV SOLENOID	SOLENOID CONTROL GROUND
14	BROWN	MAG IGNITION COIL / STATOR / STATOR	GROUND
15	GREEN / RED	STATOR - EXCITER COIL	EXCITER COIL
16	GREEN / YELLOW	STATOR - EXCITER COIL	EXCITER COIL
17	WHITE / GREEN	CRANK POSITION SENSOR	5 TOOTH COIL GROUND
18	WHITE / RED	CRANK POSITION SENSOR	2 TOOTH COIL GROUND
19	BLACK / BLUE	DETONATION SENSOR	GROUND
20	PURPLE	DETONATION SENSOR	SENSOR SIGNAL
21	RED / BLUE	MAG / PTO FULL LOAD INJECTOR	INJECTOR POWER SUPPLY
22	RED / BLUE	MAG / PTO PART LOAD INJECTOR	INJECTOR POWER SUPPLY
23	AQUA	TPS	SENSOR SIGNAL RETURN
24	BLACK / BLUE	COOLANT TEMP. SENSOR / TPS	SENSOR GROUND
25	YELLOW	COOLANT TEMP. SENSOR	SENSOR SIGNAL RETURN
26	RED	EV SOLENOID	REGULATED VOLTAGE

Chassis Relay



Throttle / Ignition Kill System

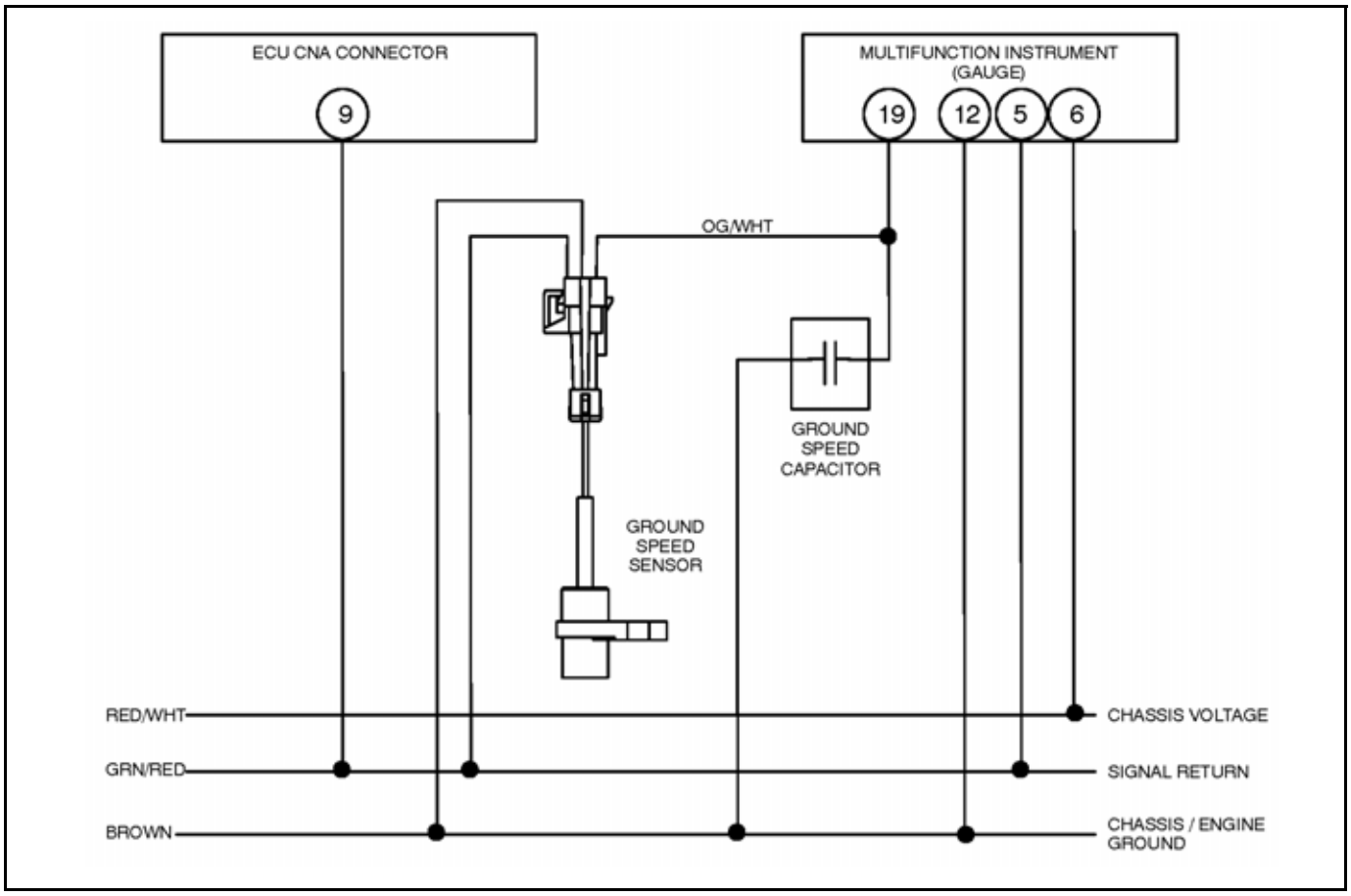


System Overview

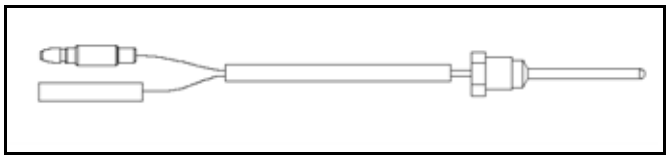
There are two methods for cutting the ignition on CFI systems. The first is the software stop system. The software stop system only applies to the throttle flipper switch. The software stop system is activated when the throttle flipper switch is closed (closed throttle), but the TPS (throttle plate position) is still above idle. When this occurs, the ECU software will determine the throttle cable is "stuck" and kill the ignition system.

The second system is the hardware stop system. The hardware stop system is a direct ignition kill system. That is, whenever the operator turns the key to off, pulls the tether, or pushes the safety slap switch down, the ignition system is immediately killed.

Vehicle Speed Sensor



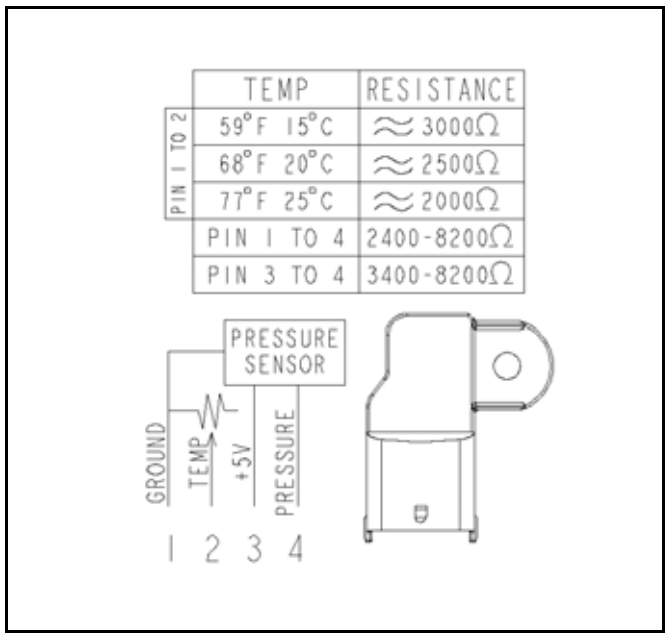
Exhaust Temperature Sensor



Sensor Specifications

Resistance Values	2.3MΩ @ 392_F (200_C) - 76Ω @ 1652_F (900_C)

Temperature / Air Pressure Sensor (TBAP)



Sensor Specifications

Pins 1 to 2 (Temperature)	59_F (15_C) = 3000Ω 68_F (20_C) = 2500Ω 77_F (25_C) = 2000Ω
Pins 1 to 4 (Pressure) Pins 3 to 4 (Pressure)	2400 - 8200Ω 3400 - 8200Ω

Crankshaft Position Sensors (CPS)

The 5 tooth crank position sensor picks up all 5 flywheel teeth.

The 2 tooth crank position sensor picks up 2 off set flywheel teeth.

Both crank position sensors will have a gap to the flywheel pick up of 0.031" (0.8mm).

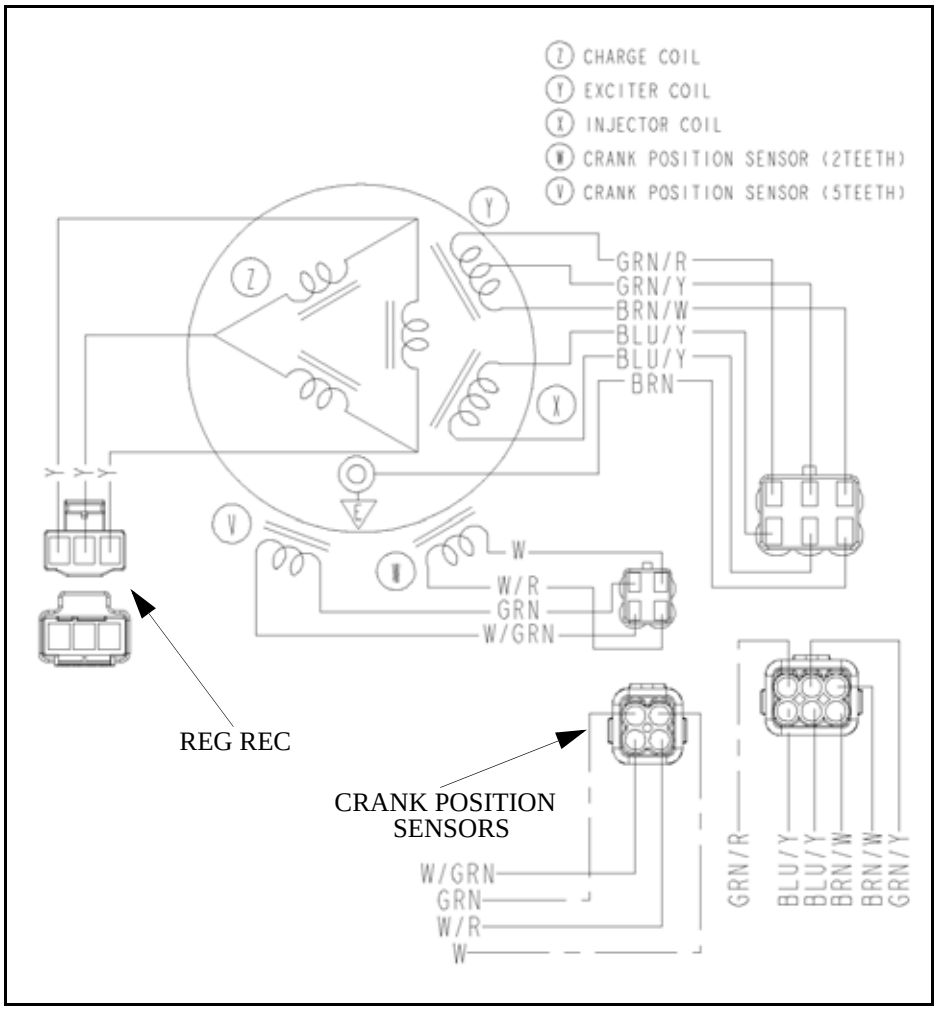
These sensors must be in the correct position or the engine will not run as expected. A sheared flywheel key will cause the engine to not start or kill if running.

The 2 tooth pick up detects the crank angle and obtains minimal information of the crank angle when control enters into limp home mode.

5 tooth pickup is to obtain the following information in combination with the 2 tooth pickup.

- Judge direction of rotation (forward and backward)
- Ignition advance angle control
- Injector drive angle control
- Excess advance ignition control at reverse

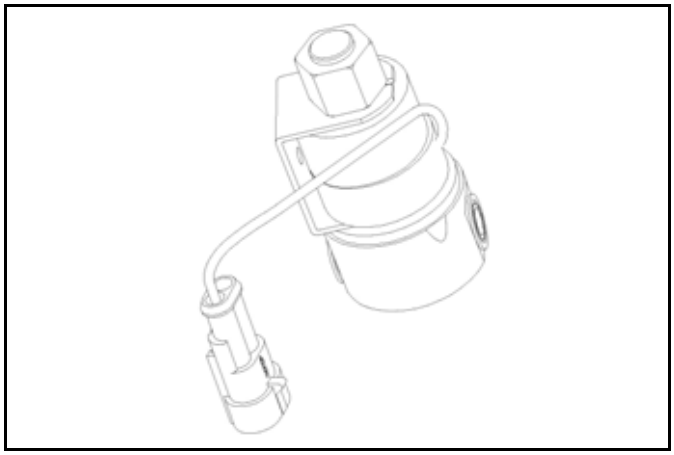
Stator Assembly



Stator Specifications

ITEM	COLOR	SYSTEM FUNCTION	RESISTANCE +/- 15% @68°F (20°C)
CHARGE	YELLOW	Chassis and Battery Charge Coils	YEL to YEL = 0.13Ω No continuity to ground.
CRANK POSITION SENSOR (CPS)	GRN to WHT/GRN	Crank Position Sensor (5 Tooth) Ignition timing.	GRN to WHT/GRN = 190Ω
	WHT to WHT/RED	Crank Position Sensor (2 Tooth) Locates TDC and RPM.	WHT to WHT/RED = 190Ω
COILS	GRN/RED	Exciter Coil - Powers the Ignition Coils / ECU	GRN/RED to GRN/YEL = 15Ω
	GRN/YEL		GRN/RED to BRN/WHT = 30Ω
	BRN/WHT		BRN/WHT to Ground = 0Ω
INJECTOR POWER COIL	BLU/YEL TO BLU/YEL	Supplies power to fuel injectors.	BLU/YEL to BLU/YEL = 2.4Ω
Engine Ground	Brown	Engine Ground	0Ω

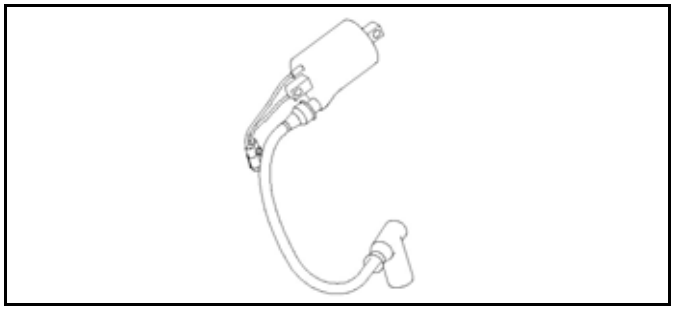
Exhaust Valve Solenoid



Specifications

Coil Resistance (WHT/YEL to RED)	15Ω +/- 15% @ 68°F (20°C)

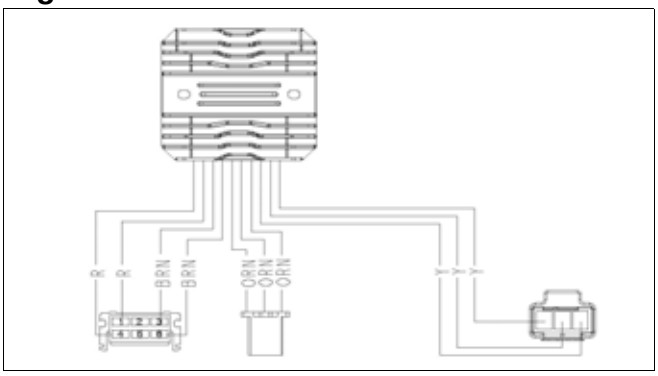
CFI Ignition Coils



Specifications

Primary Coil Resistance (Black to White)	0.45Ω +/- 15% @ 68°F (20°C)
Secondary Coil Resistance (Without Plug Cap) (Black to High Tension Lead)	18,000Ω +/- 15% @ 68°F (20°C)
Plug Cap Resistance	4,000Ω - 6,000Ω

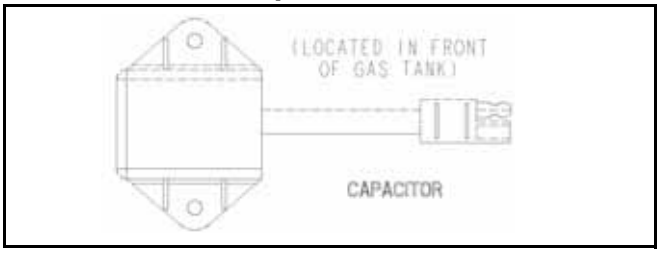
Regulator / Rectifier



Regulator / Rectifier Connections

CONNECTOR	WIRE COLORS	ITEM
STATOR	YELLOW	Vac from stator charge coils.
ECU	ORANGE	Vdc supplied to ECU to boost power to fuel injectors during engine start-up.
CHASSIS	BROWN	14.5 Vdc chassis power supply.
	RED	

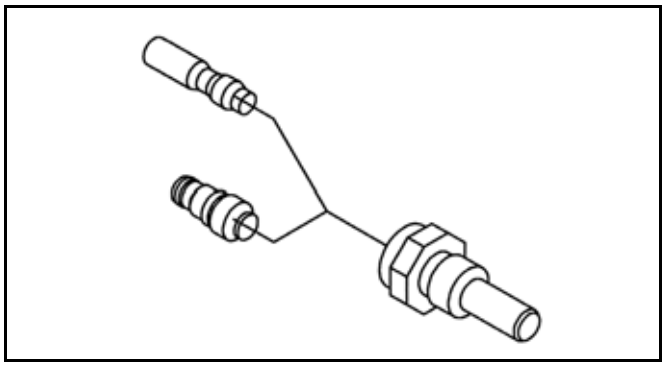
Chassis Power Capacitor



Capacitor Testing

1. Charge the capacitor for 10 seconds using a 12 volt battery by connecting the positive (+) lead to the Red/White wire and the negative (-) lead to the brown wire.
2. Monitor the capacitor voltage with a multimeter. The voltage should slowly drain down from the initial charge. If the cap does not hold a charge or drains rapidly, replace the component.

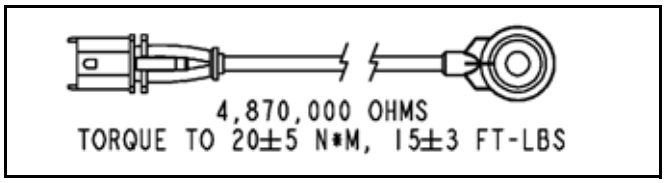
Engine Coolant Temperature Sensor



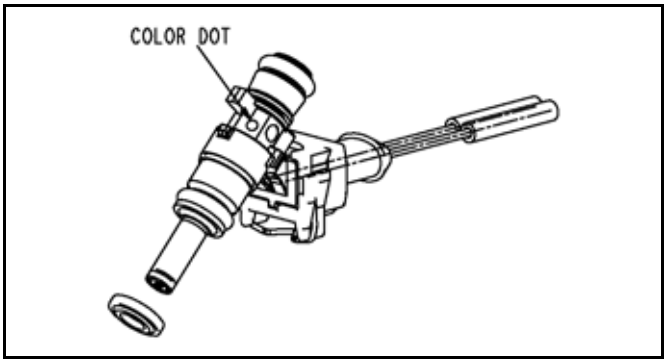
Sensor Specifications

Operating Temperature Range	-22_F - +248 _F (-30_C - 120_C)
Resistance	2.4 - 2.6KΩ@ 68_F (20_C) (Measure in stirred water)
Installation Torque	29 ft.lbs. (39.2Nm)

Knock Sensor



Fuel Injectors



Specifications

Resistance	12Ω @ 68_F (20_C)

Fuel injectors are flow tested and then color coded (RED, BLUE, or YELLOW) based on upon how much fuel the injector flows during the test.

When replacing a faulty fuel injector, always replace with an injector with the same color code. If replacing with an injector with a different color code, all four fuel injectors must be replaced with the new color so all four injectors are the same color.

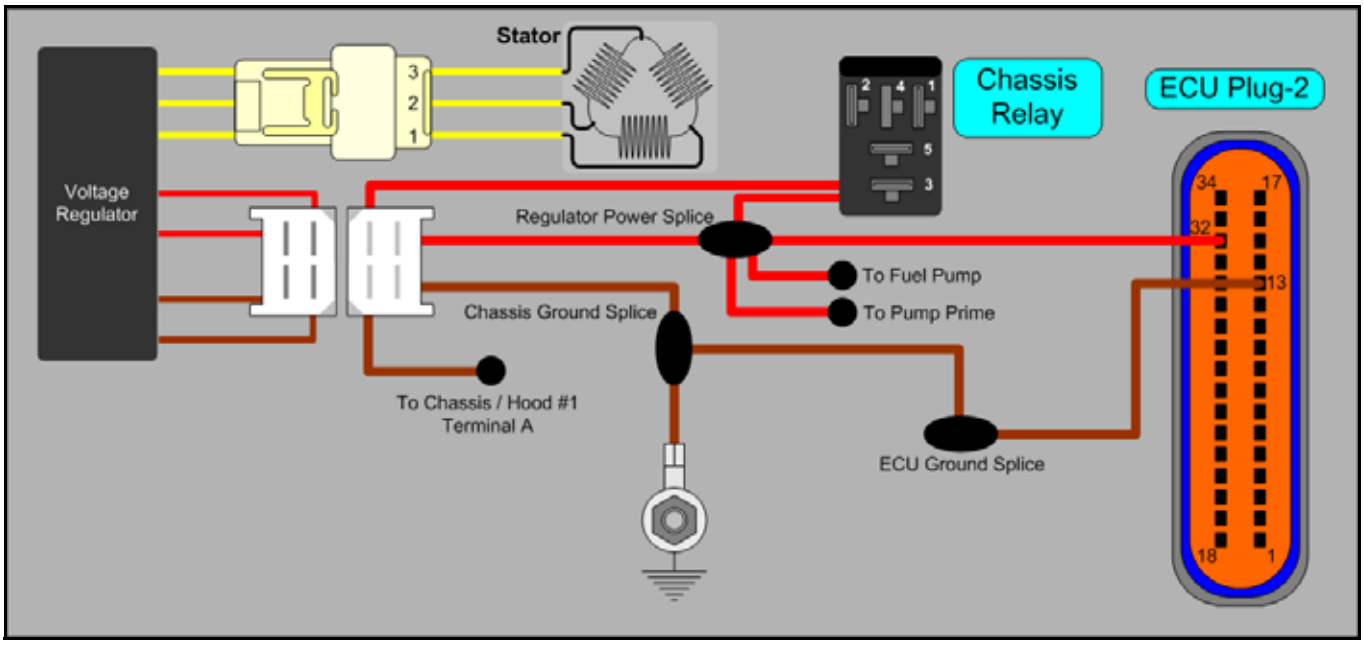
After replacing all four injectors, the ECU must be reflashed so the fuel calibration map matches the new color coded fuel injectors.

Reference Chapter 4 for fuel injector replacement procedures.

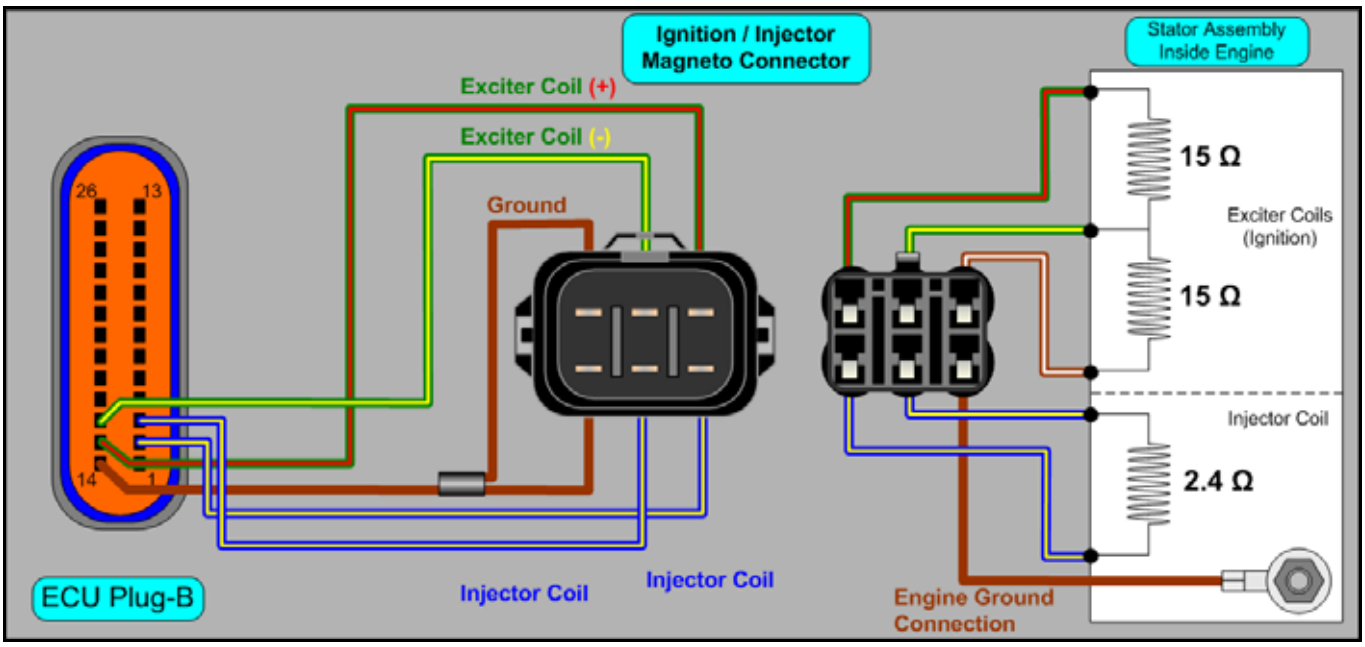
⚠ CAUTION

NEVER RUN THE ENGINE WITH DIFFERENT COLOR FUEL INJECTORS. SEVERE ENGINE DAMAGE WILL OCCUR.
ALWAYS VERIFY THE ECU CALIBRATION FILE MATCHES THE FUEL INJECTOR COLOR CODES.

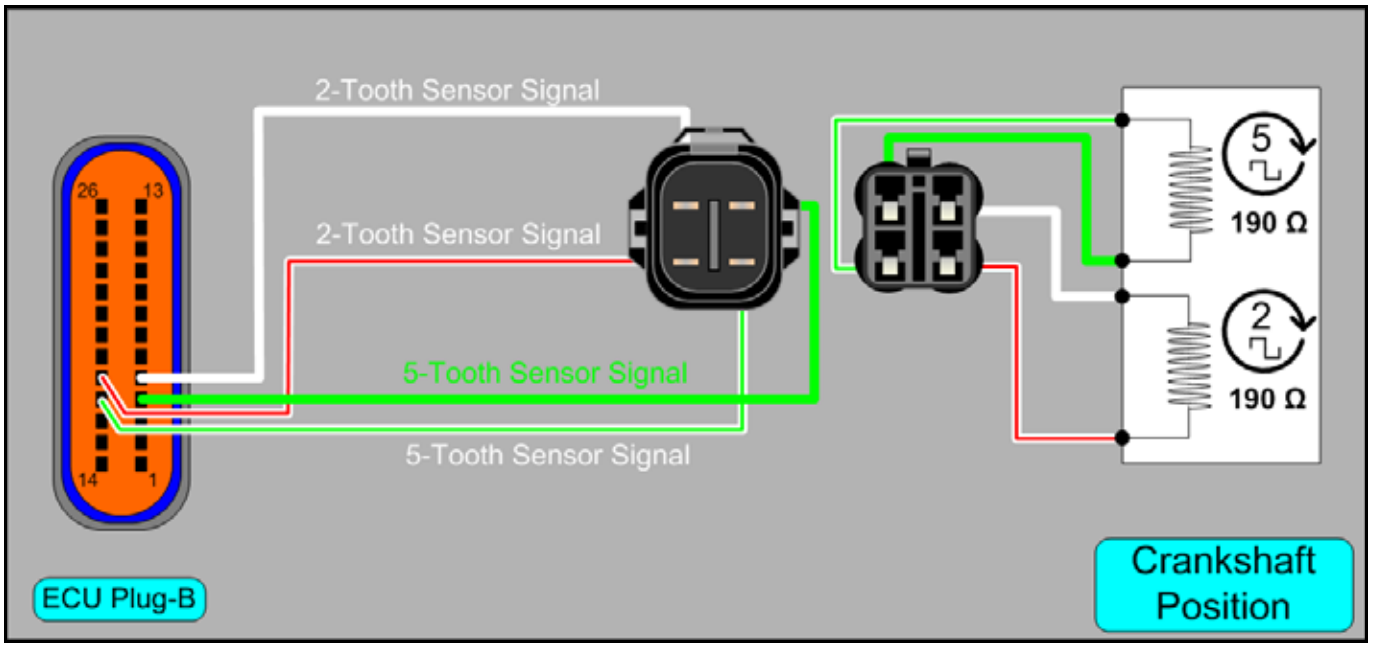
CFI Power System



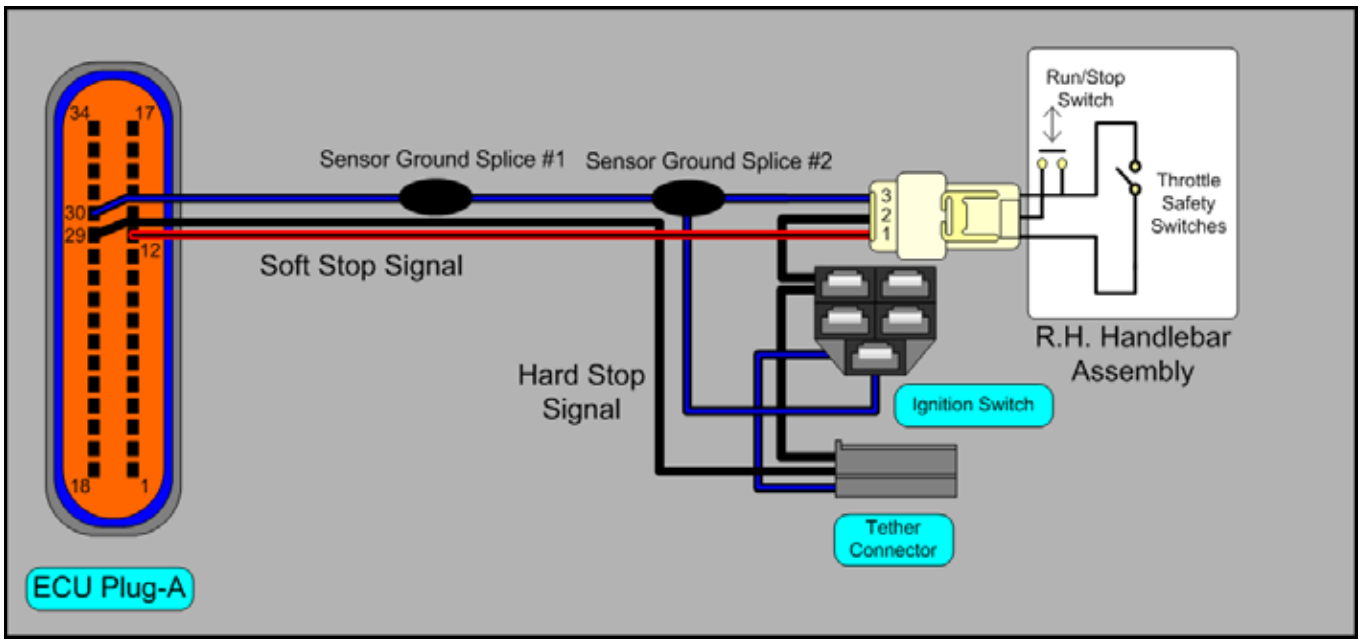
CFI Ignition / Injection Power



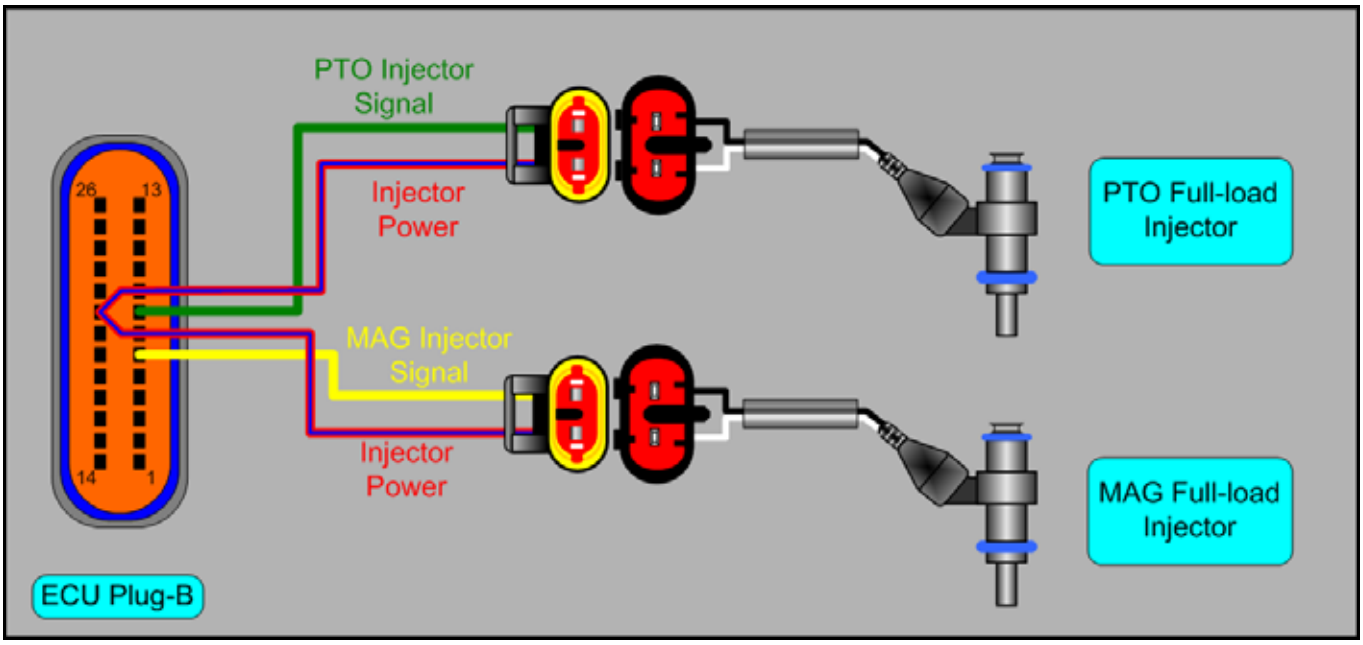
CFI Crank Position System



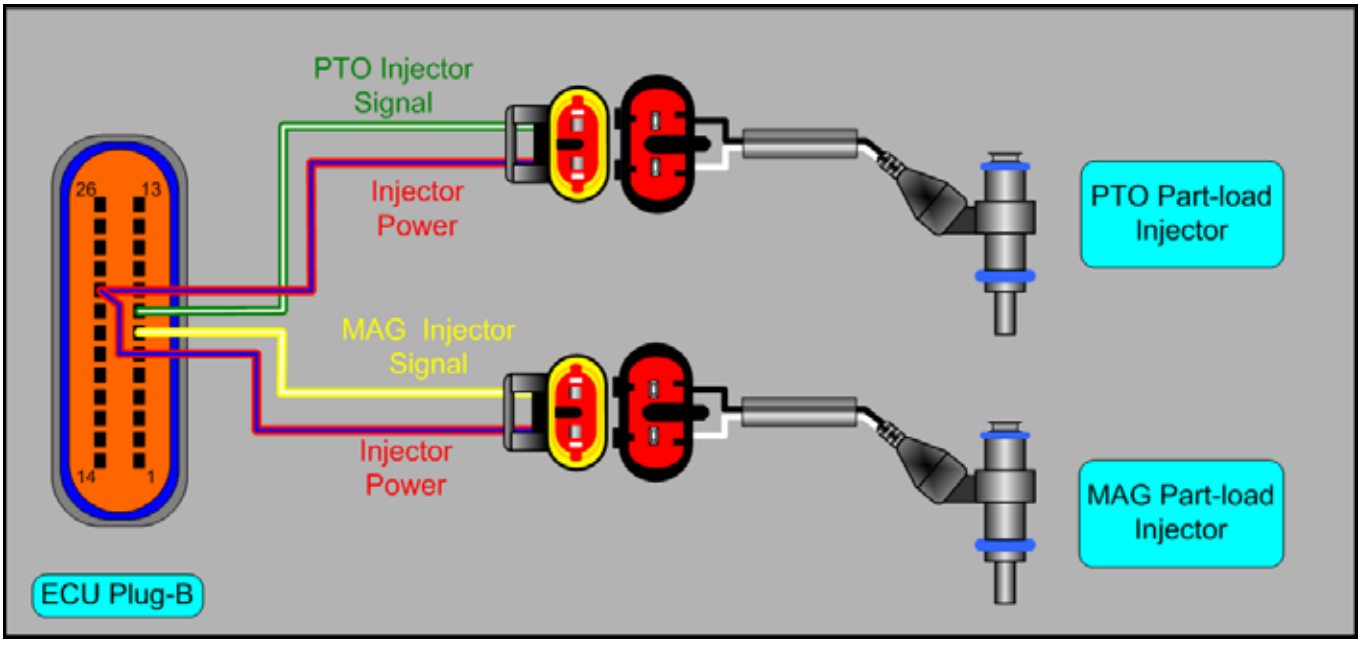
CFI Safety Stop System



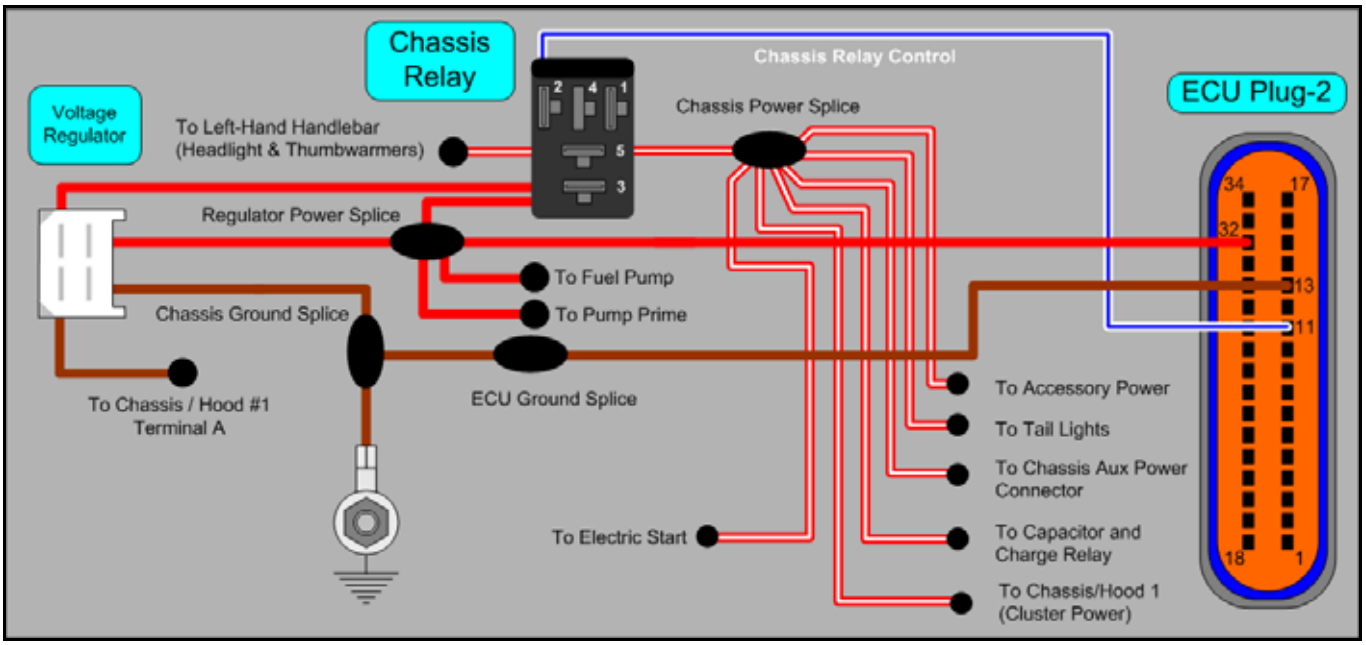
CFI Full Load Fuel Injectors



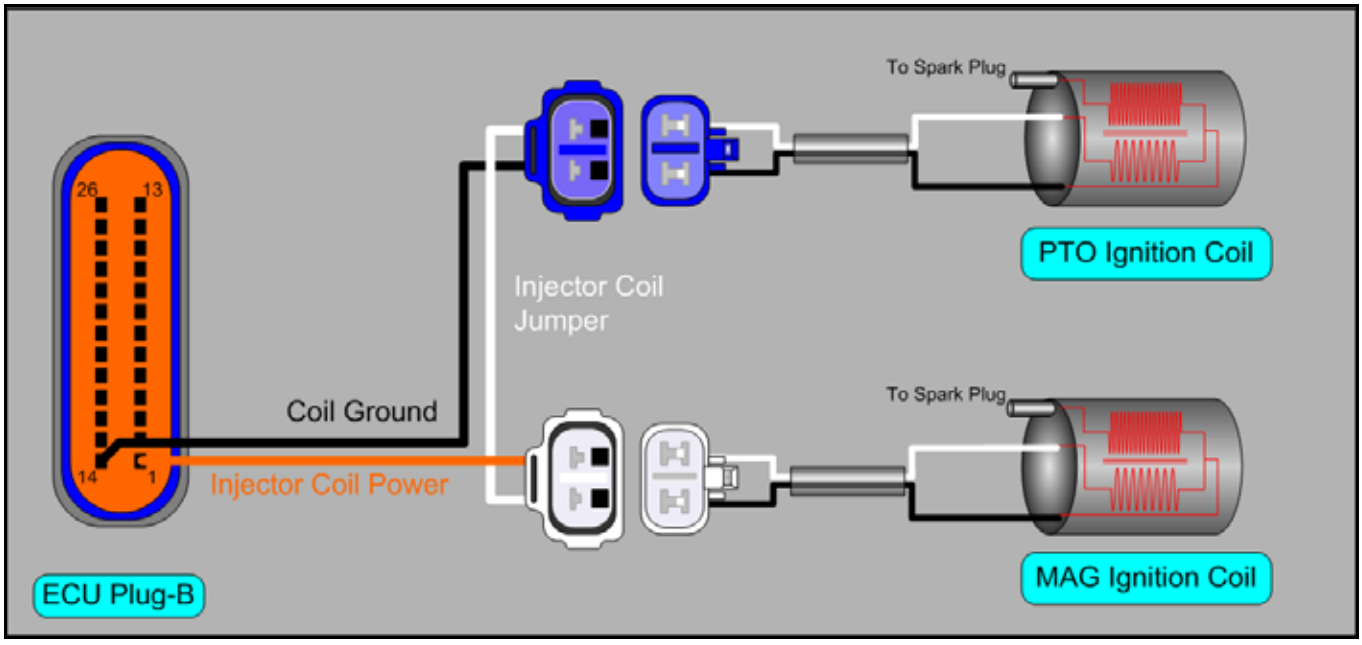
CFI Part Load Fuel Injectors



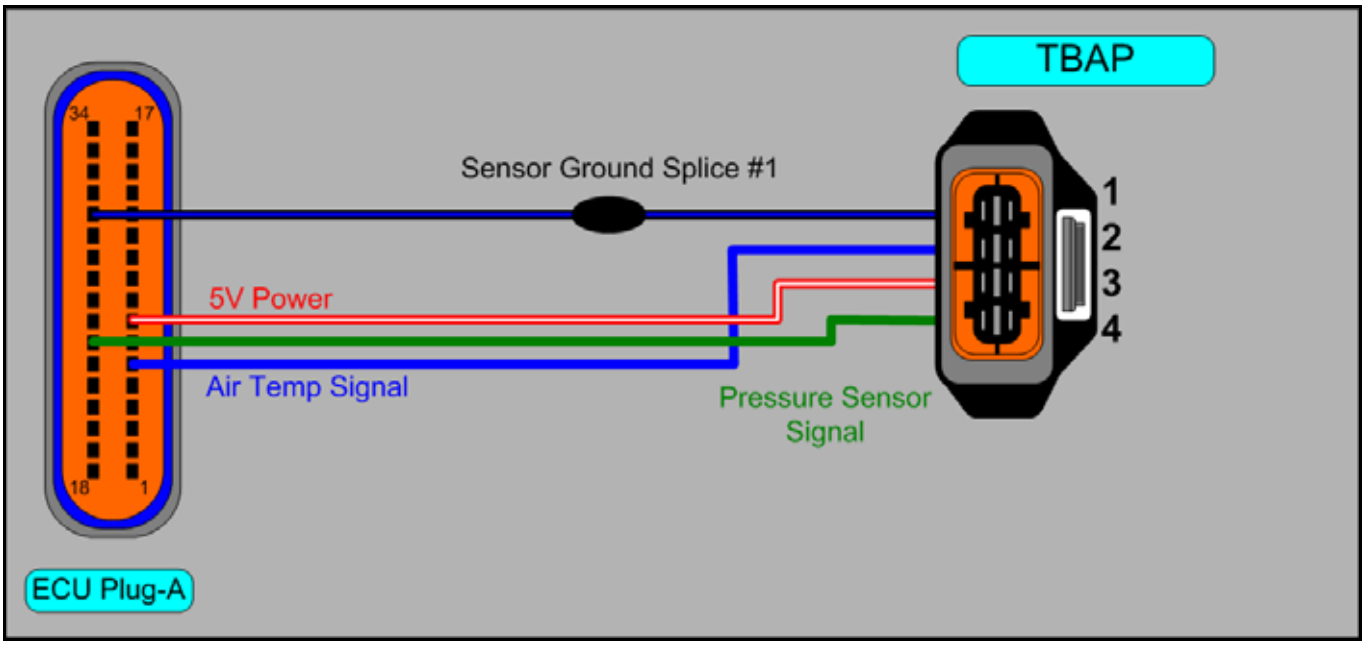
CFI Chassis Power



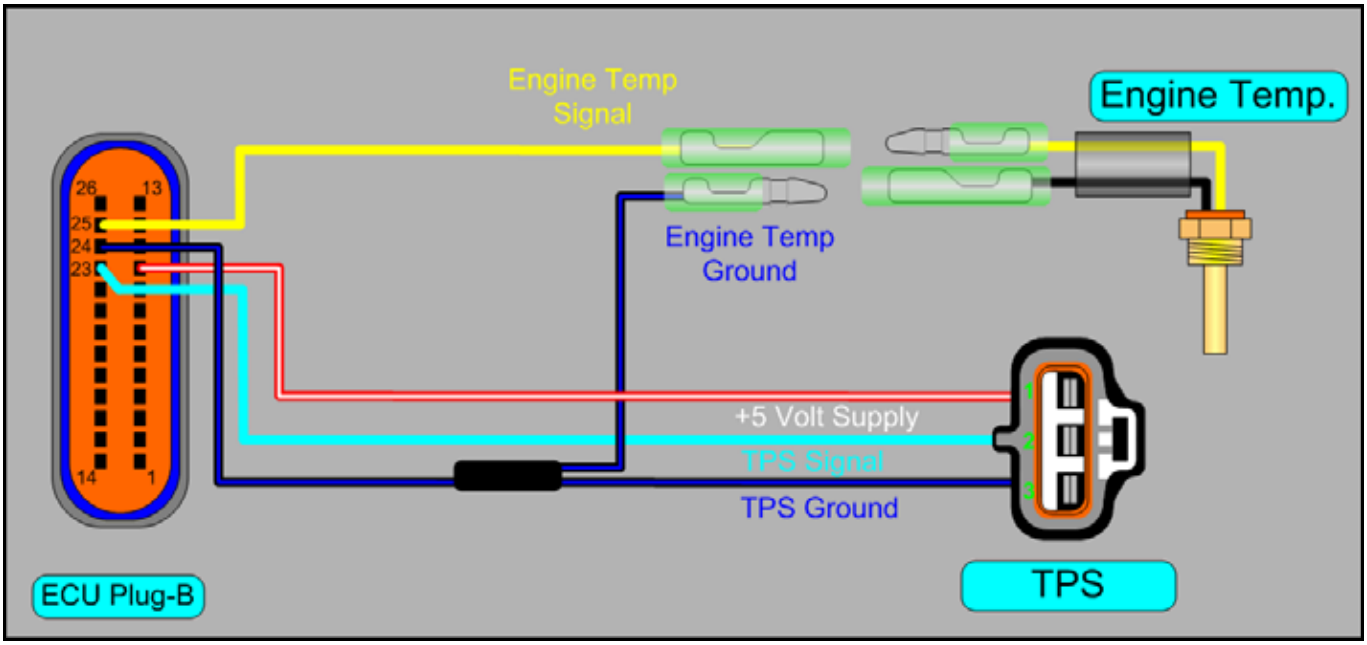
CFI Ignition Coils



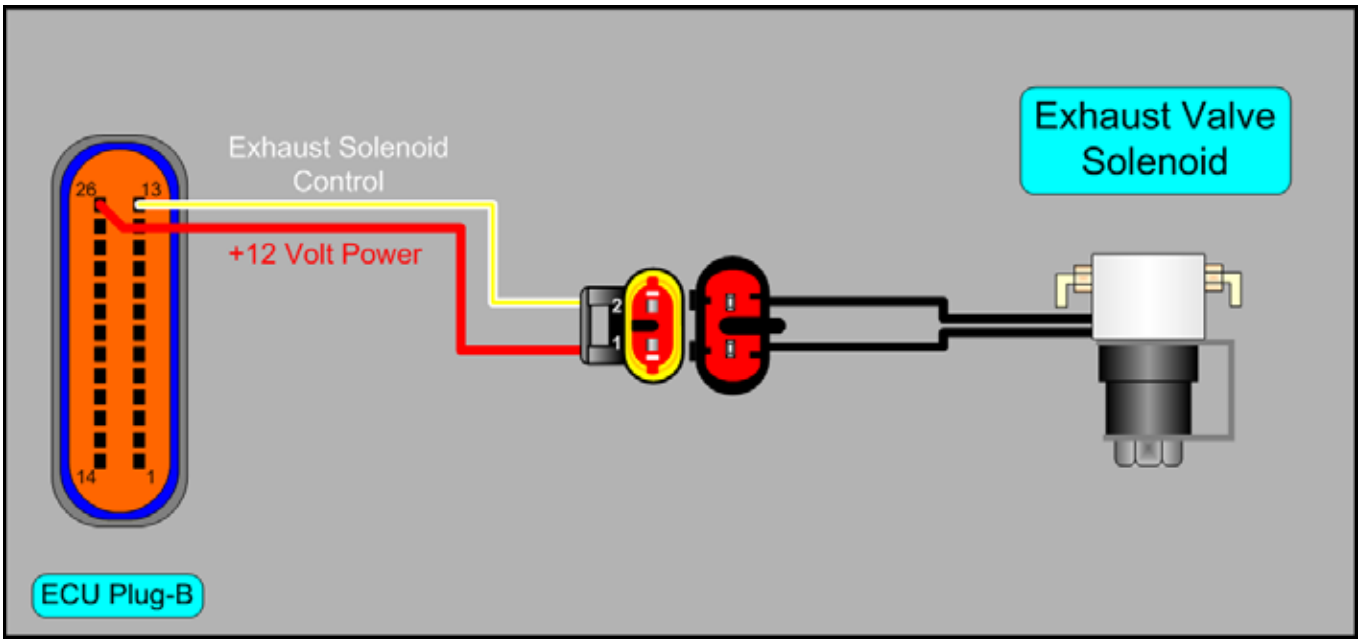
CFI TBAP Sensor



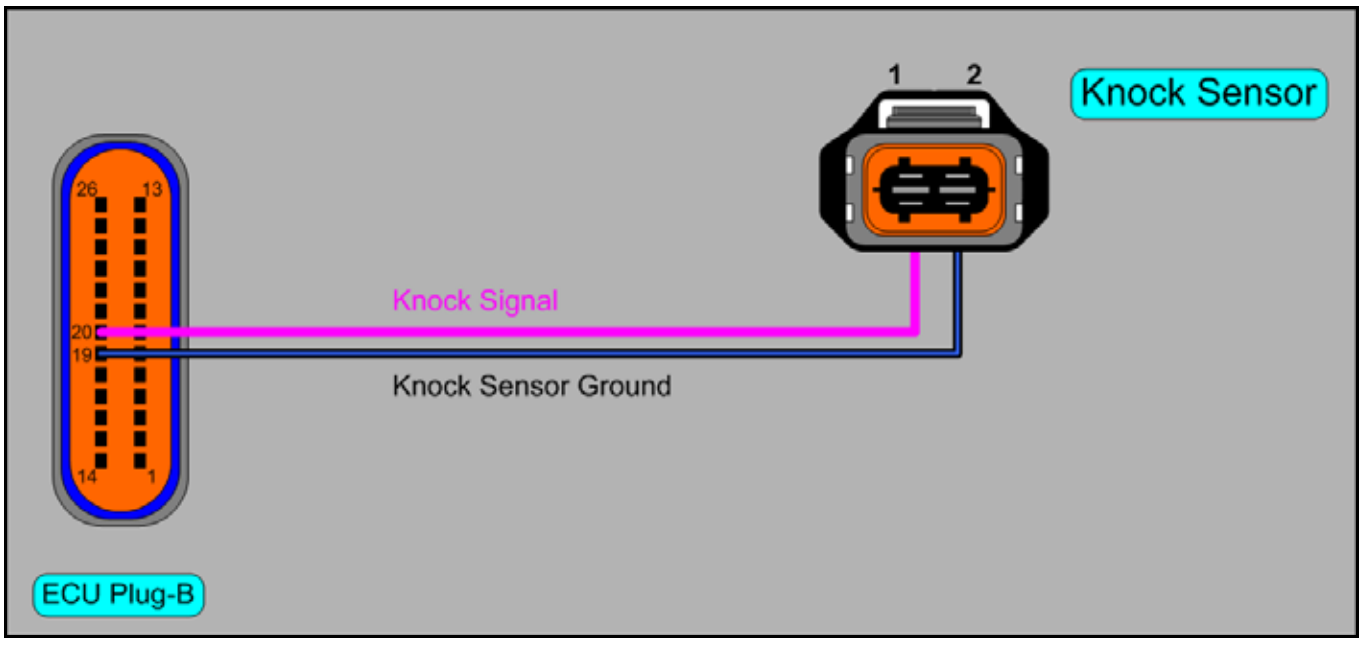
CFI TPS / Engine Temp. Sensors



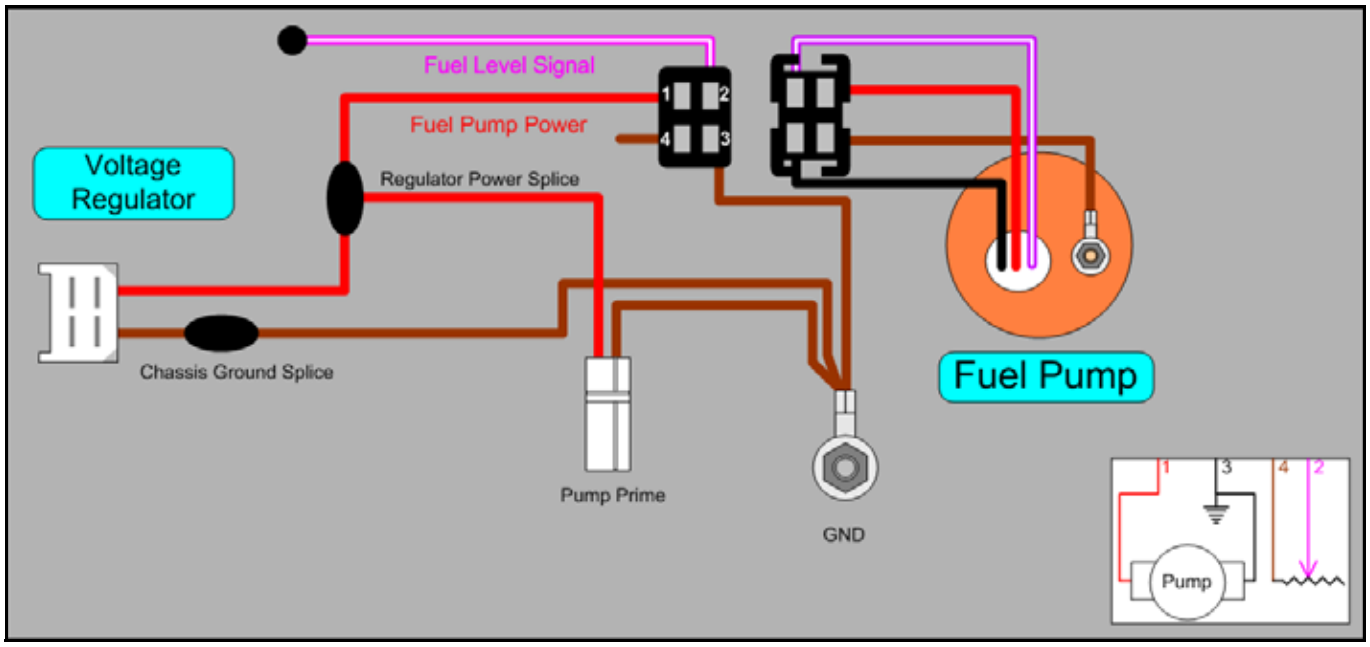
CFI Exhaust Solenoid



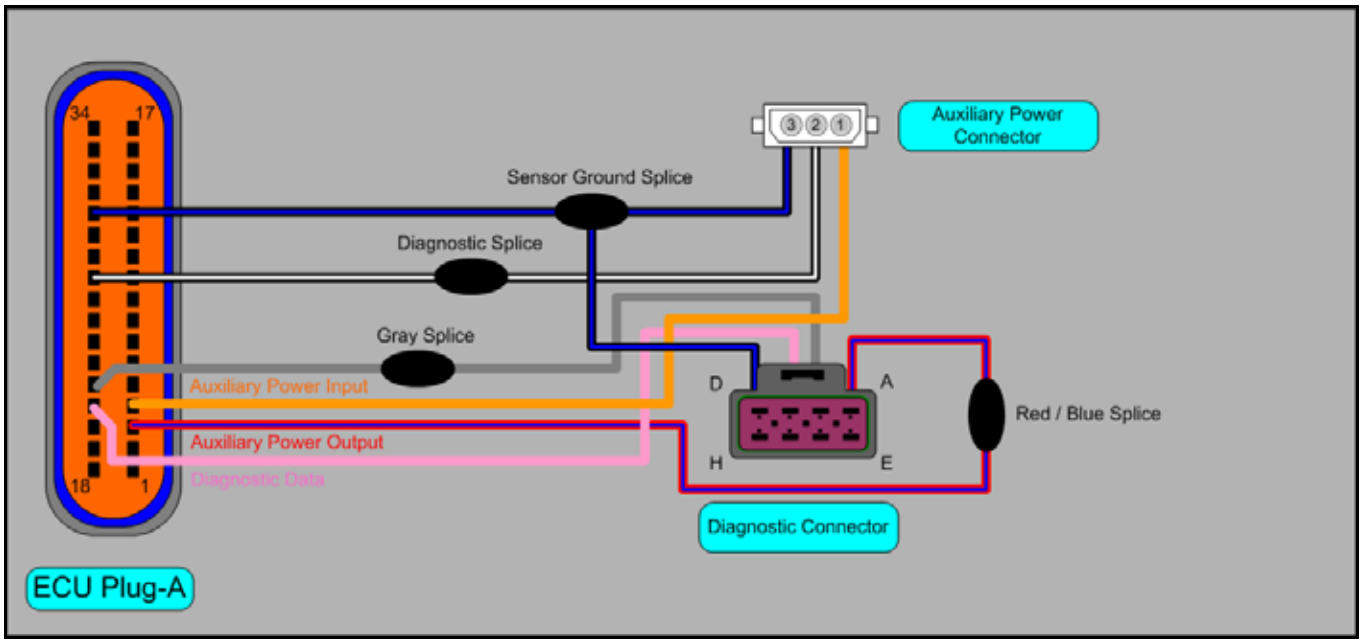
CFI Knock Sensor



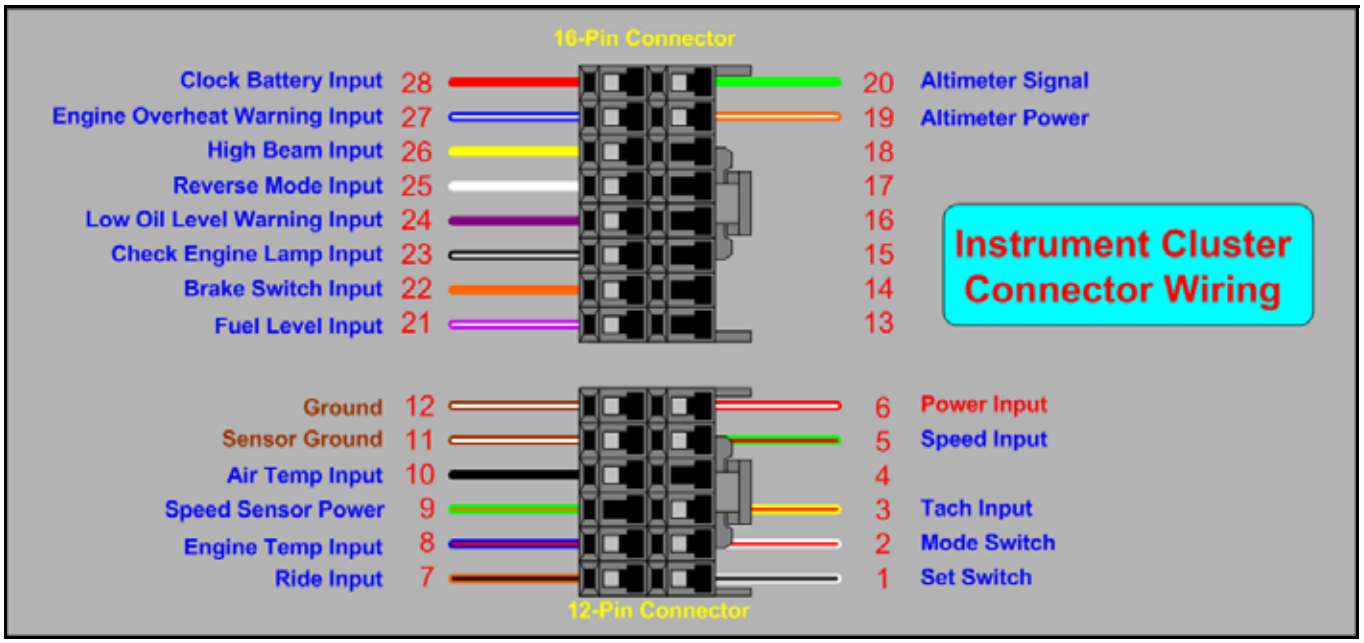
CFI Fuel Pump



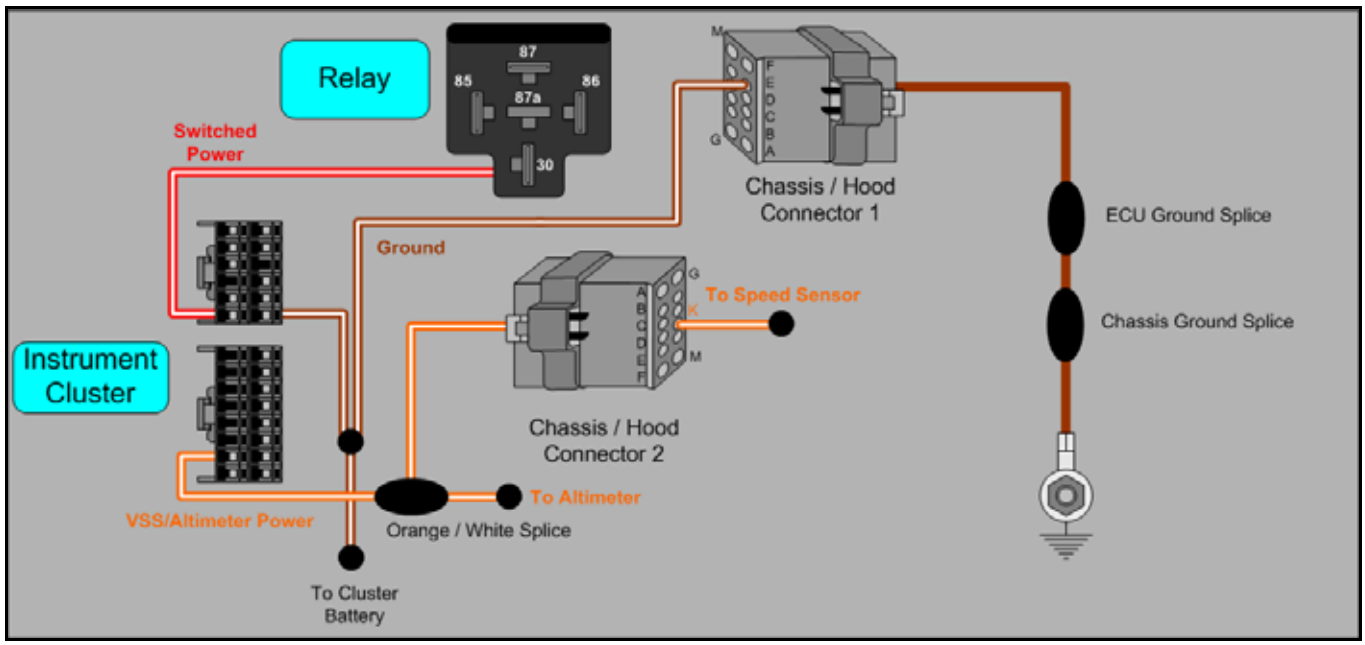
CFI Diagnostic Connections



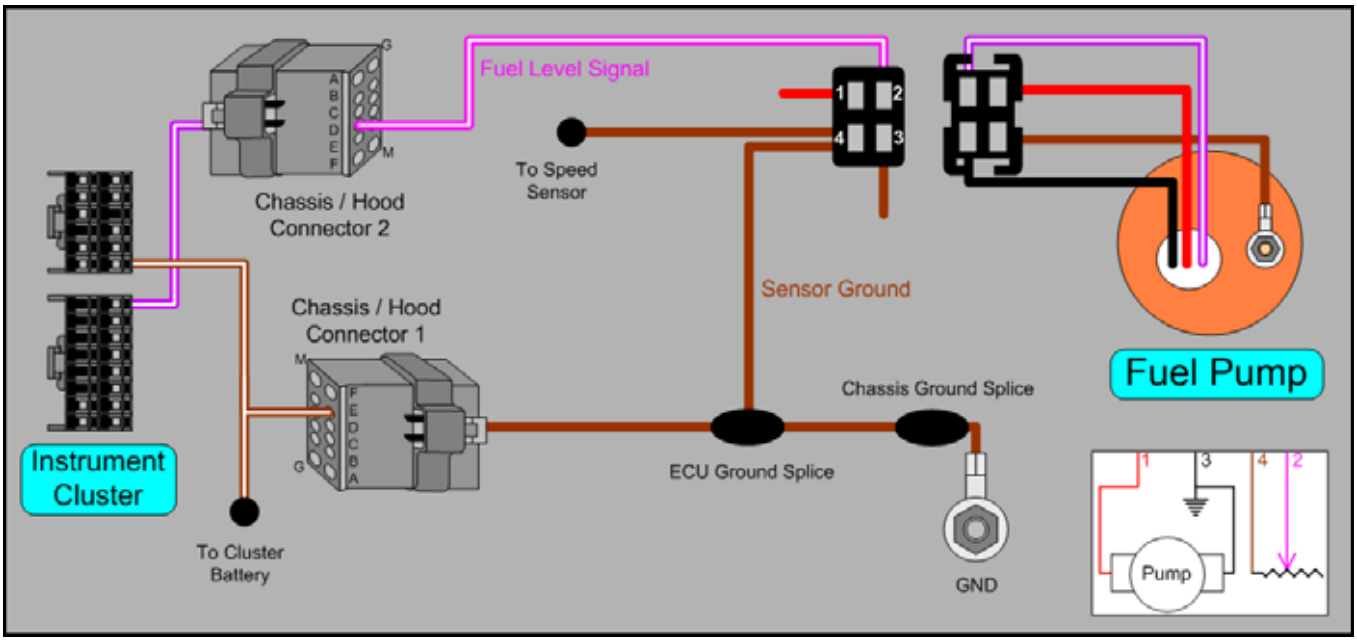
CFI MFD Circuits



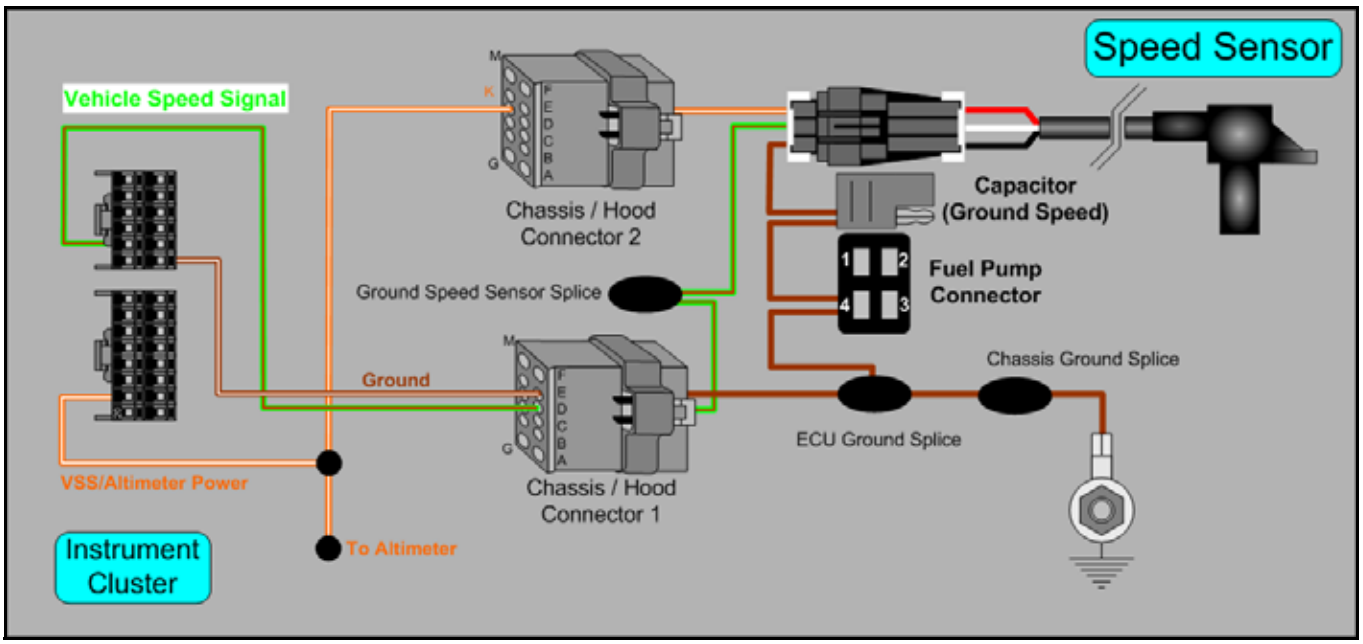
CFI MFD Power Circuits



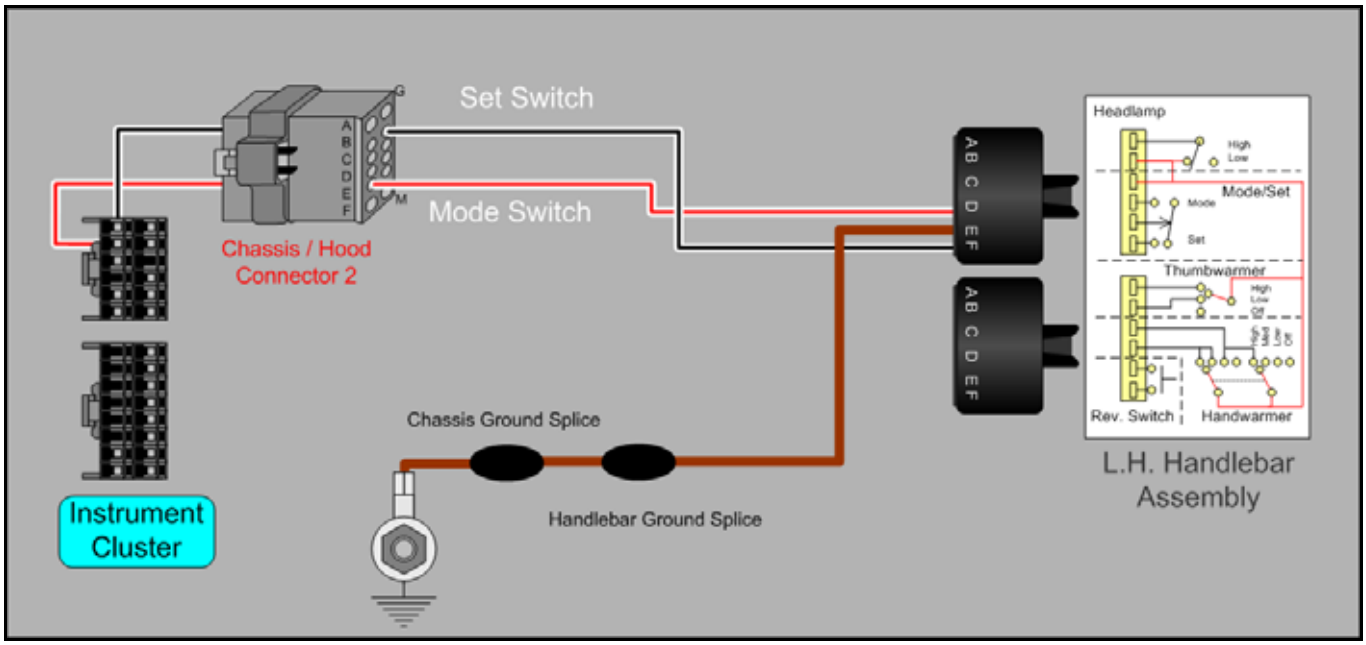
CFI Fuel Level Circuit



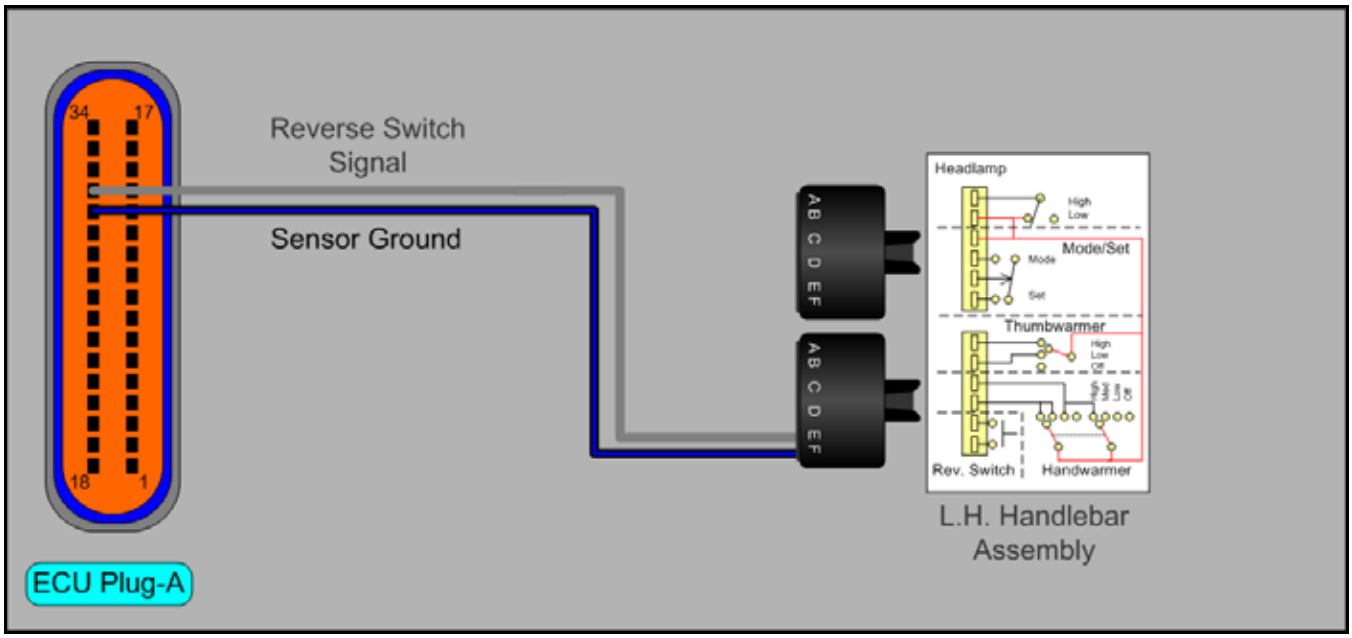
CFI Vehicle Speed Circuit



CFI Mode Set Switch



CFI PERC Switch



DIGITAL WRENCH DIAGNOSTIC SOFTWARE

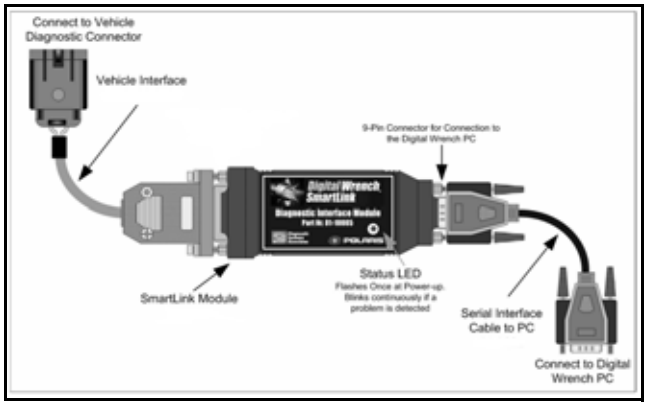
Overview

The Digital Wrench diagnostic software allows the technician to perform the following tests and observations:

- View / clear trouble codes
- Analyze real-time engine data
- Reflash ECU calibration files
- Guided diagnostics
- Create customer service account records

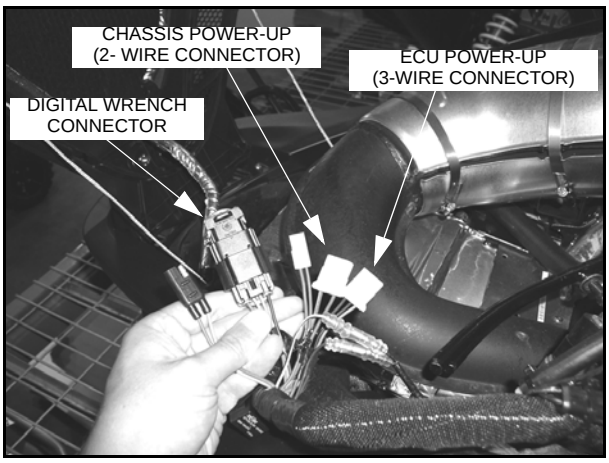
The following components are required to use the Digital Wrench software:

- PC or laptop with Microsoft Windows operating system
- Digital Wrench software, part number PU-47063
- Smart Link Module, part number PU-47468
- Interface Cable, part number PU-47469
- PC Interface Cable, part number PU-47470
- Smart Link Module Kit (Includes PU-47468, PU-47469, and PU-47470 in one kit), part number PU-47471
- M-10 ACE / ECU-Chassis Power-Up Cable, part number PA-46355
- 12-volt battery



Digital Wrench Connections

The access point for the ECU power-up and Digital Wrench connectors is located in the front, left-side of the nosepan.



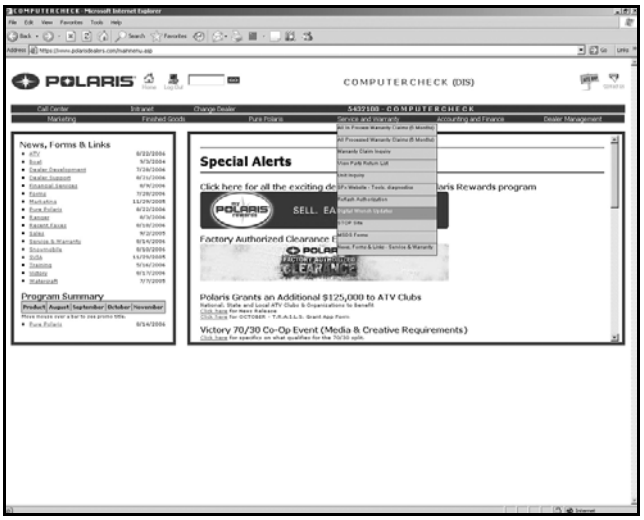
Follow these steps to connect the diagnostic and power-up cables to the snowmobile:

1. Assemble the Smart Link cables and module as shown in the illustration.
2. Open the hood and locate the connectors. Remove the protective cap from the diagnostic connector.
3. Connect the vehicle interface cable to the diagnostic connector.
4. Using the power-up cable, part number PA-46355, and a fully charged 12-volt battery, connect the power-up cable to the ECU connector.

NOTE: To verify the 12-volt battery and power-up cable are working, connect the cable to the chassis power-up connector. If working correctly, the headlights should illuminate.

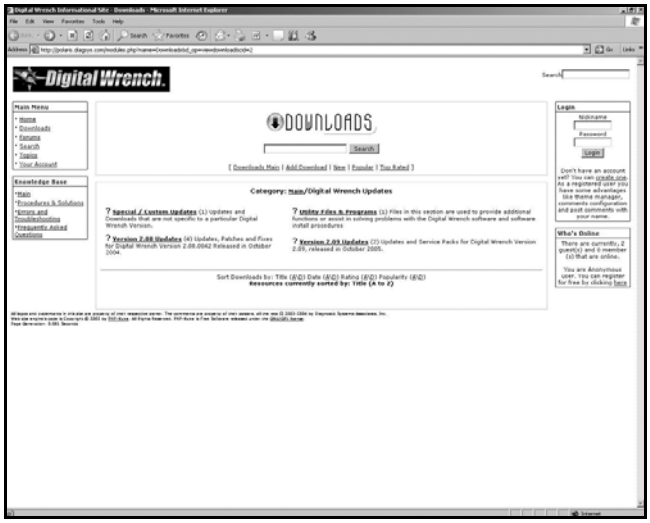
Updating Digital Wrench

Fileset updates and service packs are released for Digital Wrench via the Internet. The Digital Wrench update website can be found by accessing the dealer Internet site at: www.polarisdealers.com.



NOTE: Only authorized Polaris dealers and distributors can access the dealer Internet 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 next screen is the Digital Wrench portal website.



The following selections can be made on the update website:

- Home - Digital Wrench Home Page
- Downloads - Listing of current filesets and Digital Wrench downloadable updates
- Forums - Member generated knowledge base
- Search - Website search engine
- Topics - Vehicle-specific Digital Wrench information

5. Locate the version of Digital Wrench currently running on the PC or laptop.
6. Locate and click on the fileset or service pack required to update the software. Save the file(s) to the PC or laptop’s desktop.
7. Locate the update file(s) on the desktop. Double-click and select “RUN” on the icon to install the update.
8. Delete the file after performing the update.

NOTE: Delete the update file from the desktop when finished.

Version / Fileset Identification

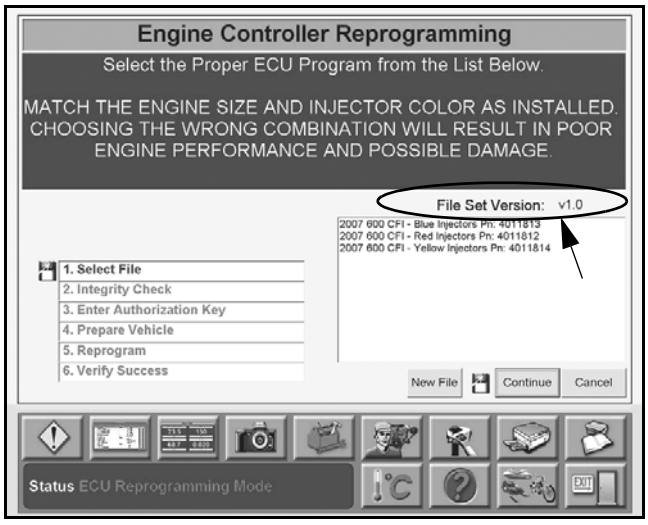
Knowing what Digital Wrench or fileset versions are installed will help determine which updates are required.

NOTE: Version and fileset versions are subject to change.

1. Start the Digital Wrench software.
2. Locate the version ID on the title screen.



3. Click on the "SPECIAL TESTS" icon (toolbox).
4. Click on "ENGINE CONTROLLER REPROGRAMMING".
5. Locate the fileset version number.



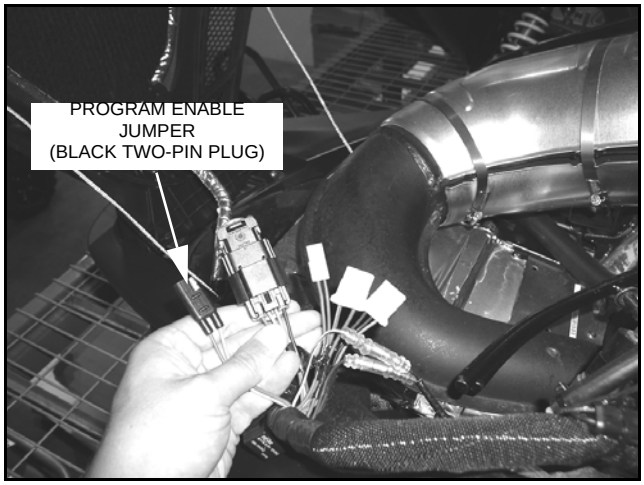
Engine Controller Reprogramming (Reflash)

NOTE: New service replacement ECUs are programmed as "no-start" and require a reflash in able to work.

1. Verify the most current service packs, updates and filesets are downloaded and loaded into Digital Wrench. See "Version / Fileset Identification" on page 11.45.
2. Connect the communication cables to the snowmobile connectors. See "Digital Wrench Connections" on page 11.43.
3. Start Digital Wrench. Select the model year and machine using the "CHANGE VEHICLE TYPE" button.
4. Click on the "SPECIAL TESTS" icon.
5. Click on "ENGINE CONTROLLER REPROGRAMMING".
6. Select the engine model and color of the injectors installed on the engine.Record the 7 digit injector part number. Click "CONTINUE".

NOTE: Remember, all four fuel injectors must share the same color code.

7. Locate the "program enable" or "mode change 2 (callout on schematic)" jumper connector. Jump the two pins using a short length of wire. Click "CONTINUE".



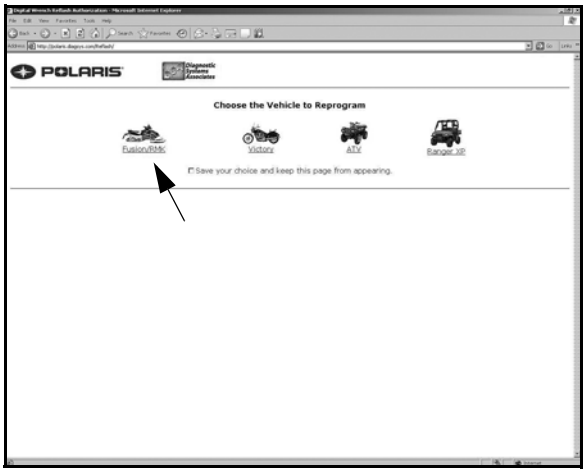
⚠ CAUTION

Do not allow the jumper wire to touch the exhaust pipe or any other grounded metal. ECU damage may occur.

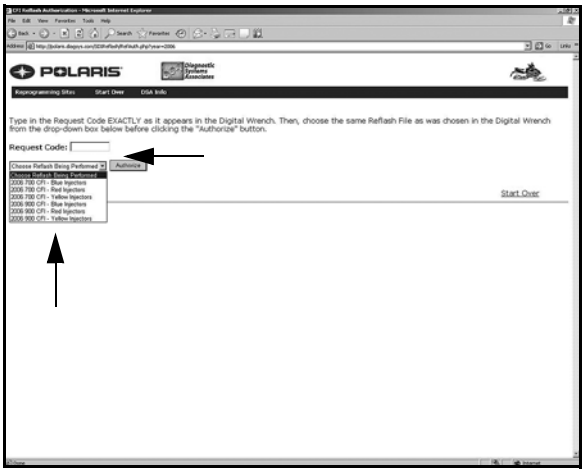
8. A request code will be generated. Record the code.



9. Access www.polarisdealers.com. Locate "REFLASH AUTHORIZATION" under the "SERVICE AND WARRANTY" drop-down menu.
10. Locate and click on the product requiring the reflash. Click on the model year.



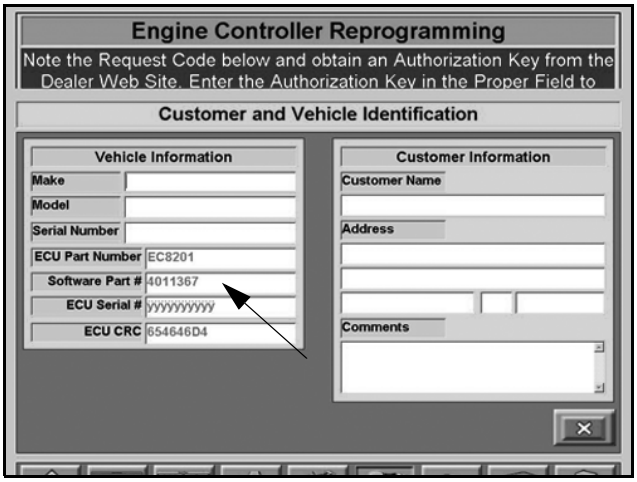
11. Enter the request code generated by Digital Wrench. Select the fuel injector color and model year/engine from the drop-down menu.



12. The website will generate an authorization code. Record the code.
13. Enter the authorization number in the box on Digital Wrench. Click on "CONTINUE".



14. The reflash process will begin. Verify all connections are properly made. Do not touch anything during the process.
15. Verify the reflash was a success by comparing the software ID number listed under the "CUSTOMER AND VEHICLE IDENTIFICATION" button with the number recorded in step 6.



CARBURETED ELECTRICAL SYSTEMS

EC50PL Stator Specifications

NOTE: Use a multimeter to test the stator circuits. Remember to test the circuits when the engine is cold and after the engine has been running for some time.

Specifications

BRN / WHT TO BLK / RED	164 Ω
YELLOW TO YEL / RED	0.2 - 0.5Ω
YEL / RED, WHT, BRN TO GROUND	0Ω

EC34 / EC55 Stator Specifications

NOTE: Use a multimeter to test the stator circuits. Remember to test the circuits when the engine is cold and after the engine has been running for some time.

Specifications

YEL TO BRN	0.16Ω
BRN TO ENGINE	0Ω
BLK / RED TO GRN	13Ω
RED TO GRN	13Ω
RED TO ENGINE	OPENΩ
BLK TO ENGINE	0Ω
WHT / RED TO WHT	185Ω
WHT TO ENGINE	OPENΩ

500cc EV / 600 HO Stator Specifications

NOTE: Use a multimeter to test the stator circuits. Remember to test the circuits when the engine is cold and after the engine has been running for some time.

Specifications

YEL TO BRN	0.15Ω
BRN TO ENGINE	0Ω
BLK / RED TO GRN	15Ω
RED TO GRN	15Ω
BLK or WHT TO ENGINE	0Ω
WHT / RED TO WHT	185Ω

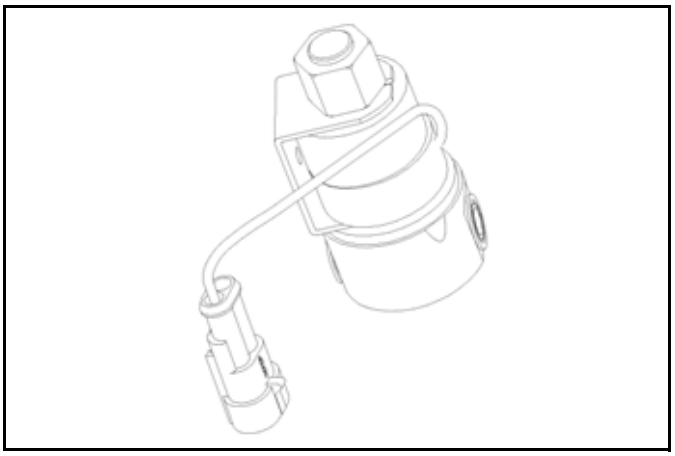
Ignition Coil Packs

NOTE: Specifications listed for all models except EC50PL (488cc) as this model features a CDI / coil pack.

Specifications

BLK TO WHT (Primary)	0.3Ω
BLK or WHT TO SECONDARY LEAD	OPENΩ
SECONDARY LEAD TO LEAD	5KΩ
PLUG CAPS	10KΩ

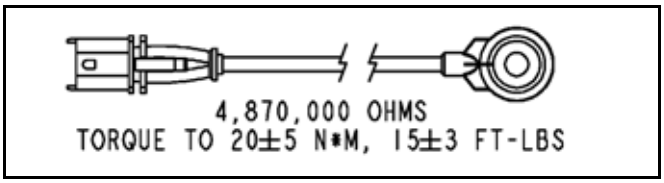
Exhaust Valve Solenoid



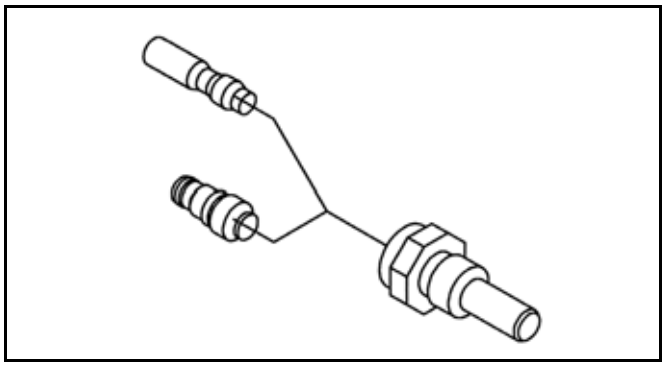
Specifications

Coil Resistance (WHT/YEL to RED)	15Ω +/- 15% @ 68°F (20°C)

Knock Sensor



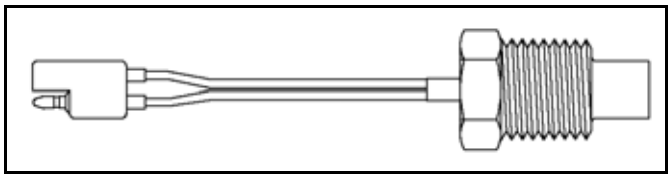
600HO Coolant Temperature Sensor



Sensor Specifications

Operating Temperature Range	-22_F - +248 _F (-30_C - 120_C)
Resistance	2.4 - 2.6KΩ@ 68_F (20_C) (Measure in stirred water)
Installation Torque	29 ft.lbs. (39.2Nm)

500 EV Coolant Temperature Sensor



Sensor Specifications

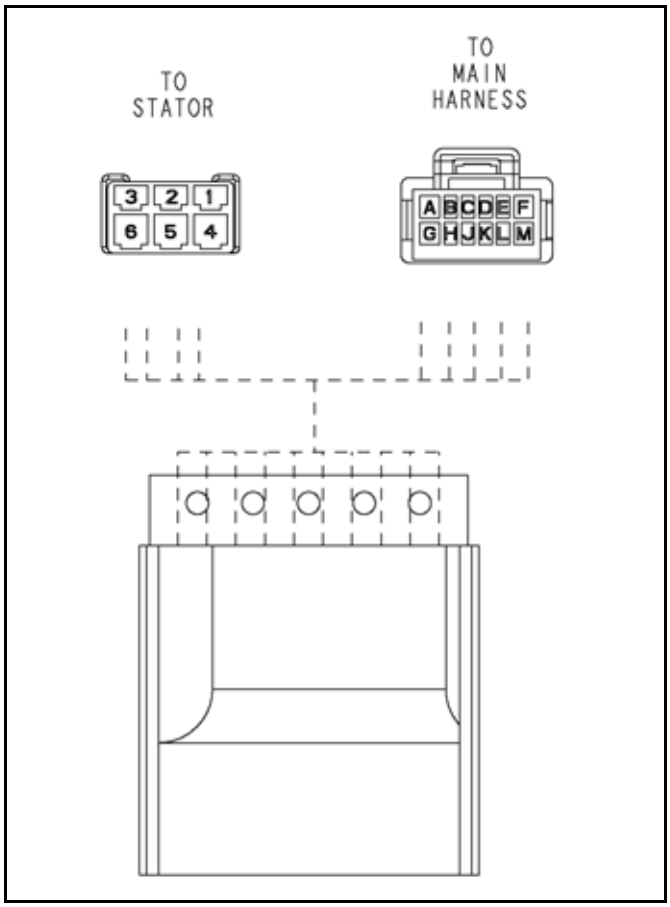
Temperature (F / C)	Resistance (OHMS)
-22_F / -30_C	22914 - 28006Ω
32_F / 0_C	5085 - 6215Ω
68_F / 20_C	2189 - 2675Ω
149_F / 6_C	455 - 556.2Ω
221_F / 105_C	152.8 - 186.8Ω

Oil Level Sender

To test the oil level sender, position the sender as it would be in the oil tank. Allow the float to drop in the direction it would if the oil tank were empty. Continuity should be present when using a multimeter to test the sender with the float in the "empty" position.

No continuity should be present when the float is moved away from the "empty" position.

600 HO Regulator / Rectifier



Circuit Specifications

PLUG / PIN / COLOR	FUNCTION
STATOR / 2 / BROWN	GROUND
STATOR / 3 / YELLOW	AC POWER INPUT
STATOR / 4 / BROWN	GROUND
STATOR / 6 / YELLOW	AC POWER INPUT
HARNESS / A / YELLOW	REGULATED AC POWER
HARNESS / B / ORG/BLK	DC BRAKE LAMP GROUND
HARNESS / C / ORANGE	AC BRAKE SIGNAL INPUT
HARNESS / D / BRN/WHT	DC GROUND
HARNESS / F / BROWN	AC GROUND
HARNESS / G / YELLOW	REGULATED AC POWER
HARNESS / J / RED/WHT	REGULATED DC MFD POWER
HARNESS / K / RED	REGULATED DC BATTERY POWER
HARNESS / M / BROWN	AC GROUND
METAL TAB	GROUND PLATE

TROUBLESHOOTING TABLES

NO SPARK

No Spark Condition

Disconnect the single black (black/white) wire from the CDI Module to the ignition kill circuit. Does it have a spark?	NO→	Check the ignition switch, wire harness, throttle safety switches and kill switch for proper adjustment or short to ground. Repair or replace as necessary.
YES ↓		
Disconnect the stator to CDI module wires. Test the resistance values of the stator coils as per the wiring diagrams. Are the resistance values within specs?	NO→	If the parts of the ignition system under the flywheel check OK, the only remaining component is the coil/CDI module assembly. Replace the module with another with the same number.
YES ↓		
Isolate which component's resistance is not within specs. Remove the flywheel and stator. Recheck the resistances; look for pinched or bare harness wires; or replace the coil.		

Incorrect Timing (Advanced/Retard)

Follow the engine timing procedure for checking running timing at recommended RPM. Is the timing within limits?	NO→	Adjust the ignition timing by rotating the stator plate to correct the timing. After adjusting the recommended RPM timing, continue with operating RPM timing if poor performance exists. (Continue on with left column.)
YES ↓		
Remove the ignition kill circuit by disconnecting the single black wire between the CDI module and the machine harness. Is the timing now correct?	NO→	Check the ignition switch, throttle safety switches, kill switch and harness for damage which can cause intermittent shorting problems. Correct the problem.
YES ↓		
Verify the correct CDI module by comparing the CU code on the box to the information listed in the ignition data charts at the beginning of this section. Is it the right module?	NO→	Replace the module with the correct part and readjust the ignition timing.
YES ↓		
Check the resistance of the coils under the flywheel. Compare these to values on wiring diagram. Are they within limits?	NO→	Check the wiring connecting the coils and/or replace the coils as necessary.

DETONATION CONTROL (DET)

Overview

Detonation control is achieved by using a knock sensor mounted to the cylinder head and an ECU (CFI engines) or the CDI (600HO engines).

The knock sensor “listens” for combustion knock by converting internal engine noise in to an electrical signal. The ECU or CDI uses the signal to determine the level of knock within the combustion chambers after each combustion event.

When the ECU or CDI determines detonation has occurred, the CHECK ENGINE / DET LED lamp will blink on and off at 0.5 second intervals.

On CFI models, the ECU will retard timing and provide additional fuel to eliminate the detonation. On carbureted engines, the CDI will retard timing until the detonation stops. If the detonation continues past a pre-determined level, the ECU or CDI will initiate an engine mis-fire mode.

To prevent detonation, follow these steps:

- Always use premium fuel (91, 92, or 93 octane)
- On carbureted engines, follow the carburetor jetting guidelines
- Do not modify the engine or exhaust system with non-approved Polaris modifications
- Verify there is no water or foreign material in the fuel
- Verify there is no internal engine damage
- Verify the cooling system is working properly

NOTE: Install the knock sensor fastener clean and dry without applying thread locker or oils.

VARIABLE EXHAUST SYSTEM (VES)

Overview

The Polaris VES system uses exhaust valves (1 per cylinder) to control the exhaust port height. The valves are actuated by controlling cylinder pressure with a solenoid, bellows, and a series of hoses.

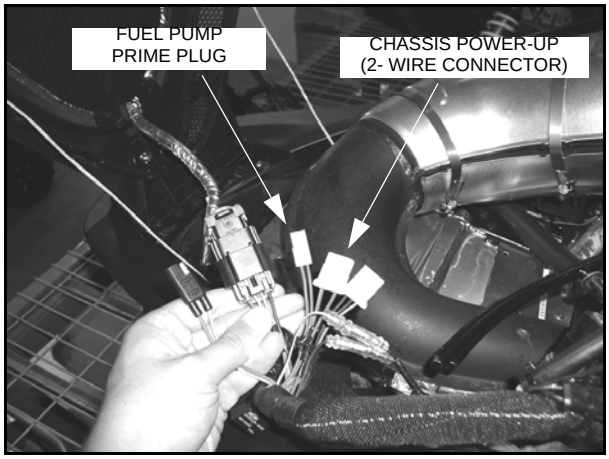
At idle speed and up to a pre-determined level, the solenoid is powered by the ECU or CDI. This action opens the solenoid’s internal valve and allows the cylinder pressure to vent into the atmosphere. During this time the valves are down.

In order to raise the valves, the ECU or CDI will cut power to the solenoid which will close the vent path to atmosphere. The cylinder pressure will then act upon each valve bellows which will raise each valve.

On CFI engines the timing at which the solenoid is turned off is determined by engine RPM, TPS position, and pipe temperature. On carbureted engines, the CDI will turn the solenoid off at 6700 RPM when the throttle flipper is at least 3/4 throttle or at 7200 RPM when the throttle flipper is at least 1/2 throttle.

NOTE: Solenoid Powered = Vent Path Open
Solenoid De-Powered = Vent Path Closed

DIAGNOSTIC PLUGS



IQ Chassis Power Plug

IQ models (CFI and carbureted) feature a chassis power diagnostic plug. Connect the plug to the M-10 ACE / ECU-Chassis Power-Up cable, PN PA-46355 and a fully charged 12-volt battery. The plug consists of two wires (BRN and RED/WHT).

Once powered, all of the RED/WHT chassis power circuits will be powered with battery voltage. The circuits include:

- Head / Tail / Brake Lamps
- MFD (Multi Function Display)
- Accessory Power Plugs
- Hand / Thumb Warmers

IQ CFI Fuel Pump Prime Plug

IQ CFI models feature a fuel pump prime plug. Use the fuel pump prime plug to power-up the fuel pump when purging the fuel system of air or when testing fuel pump pressure.

The fuel pump prime plug consists of two wires (BRN and RED).

ELECTRONIC REVERSE (PERC)

Overview

Some models are equipped with Polaris electric reverse control (PERC). The operation of the electronic reverse system is achieved by automatically reversing the engine rotation with a push of a button. When in reverse you will have an indicator light that will flash, notifying you that the machine is in the reverse mode. The design of the clutches are matched to the specifications that will allow the backwards rotation of the engine to move the sled in reverse. To get back to forward is as easy as pushing the button again.

Operation

⚠ WARNING

Reverse operation, even at low speeds, may cause loss of control, resulting in serious injury or death. To avoid loss of control, always:
LOOK BEHIND BEFORE AND WHILE BACKING.
AVOID SHARP TURNS.
SHIFT TO OR FROM REVERSE ONLY WHEN STOPPED.
APPLY THROTLE SLOWLY.

⚠ CAUTION

To avoid personal injury and/or engine damage, do not operate the electric start or recoil while engine is running.

1. Ensure that the vehicle is stopped and the engine is warmed up and running at idle.

NOTE: ***The system will only engage in reverse if the engine is below 4000 RPM. If engine is above 4000 RPM the system can not be activated.***

2. Ensure that the path behind you is clear.
3. Push and hold the yellow reverse button on the left hand control for 1 second and then release the button. The reverse light on the instrument panel will flash when engine is in reverse motion.

NOTE: ***The engine will automatically reduce RPM and it will reverse the rotation of the engine when the RPM is at the lowest RPM point.***

4. Ensure that the path behind you is clear.
5. Slowly apply throttle until the sled starts to move in reverse, and carefully direct the sled in the direction that you want.

NOTE: ***Maximum RPM in reverse is 6000 RPM.***

NOTE: If the engine stops running or is shut off while in reverse. The engine will start in forward gear.

FORWARD OPERATION

1. If unit was operated in reverse, ensure that the path ahead is clear, and push an hold the reverse button for 1 second and then release the button. The engine will now automatically change direction form reverse to forward and the reverse light on the instrument panel will stop flashing.

NOTE: *When servicing clutches, ensure that the vehicle is in forward gear. If not damage to the driven clutch may occur when removing the belt*.

Altitude Setting

If your engine is carbureted, you can adjust the elevation setting of the Polaris electric reverse control (PERC). If your engine is a Cleanfire system, this is automatically done through the engine controller unit (ECU), and you do not need to do any setting.

At higher elevations over 6000 ft (1829m), the engine requires a different ignition RPM setting to improve the operation of the reverse system.

To set the altitude settings:

1. With the engine running, push and hold the reverse button for 5 - 6 seconds and then release the button.
2. The reverse light will flash rapidly on the instrument panel.
3. You have now set the PERC system to the higher elevation setting.
4. To go back to the low elevation setting repeat step 1. The reverse light will flash slowly indicating that the system is now in the lower elevation setting.

NOTE: *The elevation setting will be set in the memory (engine running or not) until it is changed*.

Important Notes

- Max RPM for shifting into reverse = 4000 RPM
- Max RPM for operating in reverse = 6000 RPM
- Engine must first reach 900 RPM at start up before the reverse system can be used. The system works between 900 and 4000 RPM.
- If the button is pushed above 4000 RPM the system is bypassed and nothing will happen.
- Flashing light on the instrument panel indicates that the system is in reverse. On carbureted units a slow flash indicates that the system is set for low elevation, and a fast flash indicates the system is set up for high elevation. Push and hold the reverse button for longer than 5 seconds to toggle back and forth from high and low elevation settings. On Cleanfire units this is automatically done through the engine controller unit (ECU).
- Elevation above 6000 ft (1829m) requires a different timing curve to eliminate a “kick-back” effect.
- If engine is shut off or dies in forward or reverse gear, the engine when started will automatically be in forward gear.
- When servicing clutches, ensure that the vehicle is in the forward gear.

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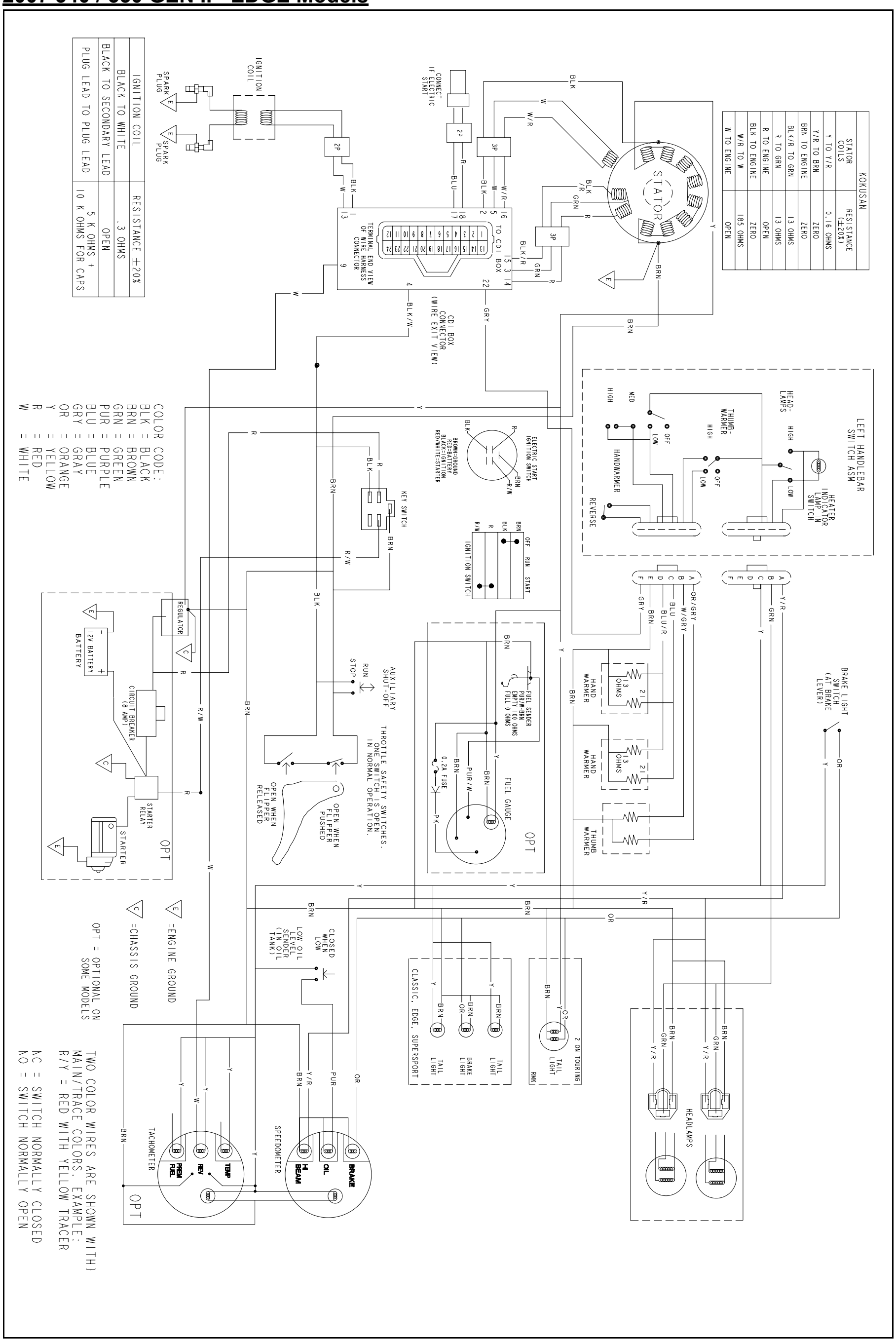
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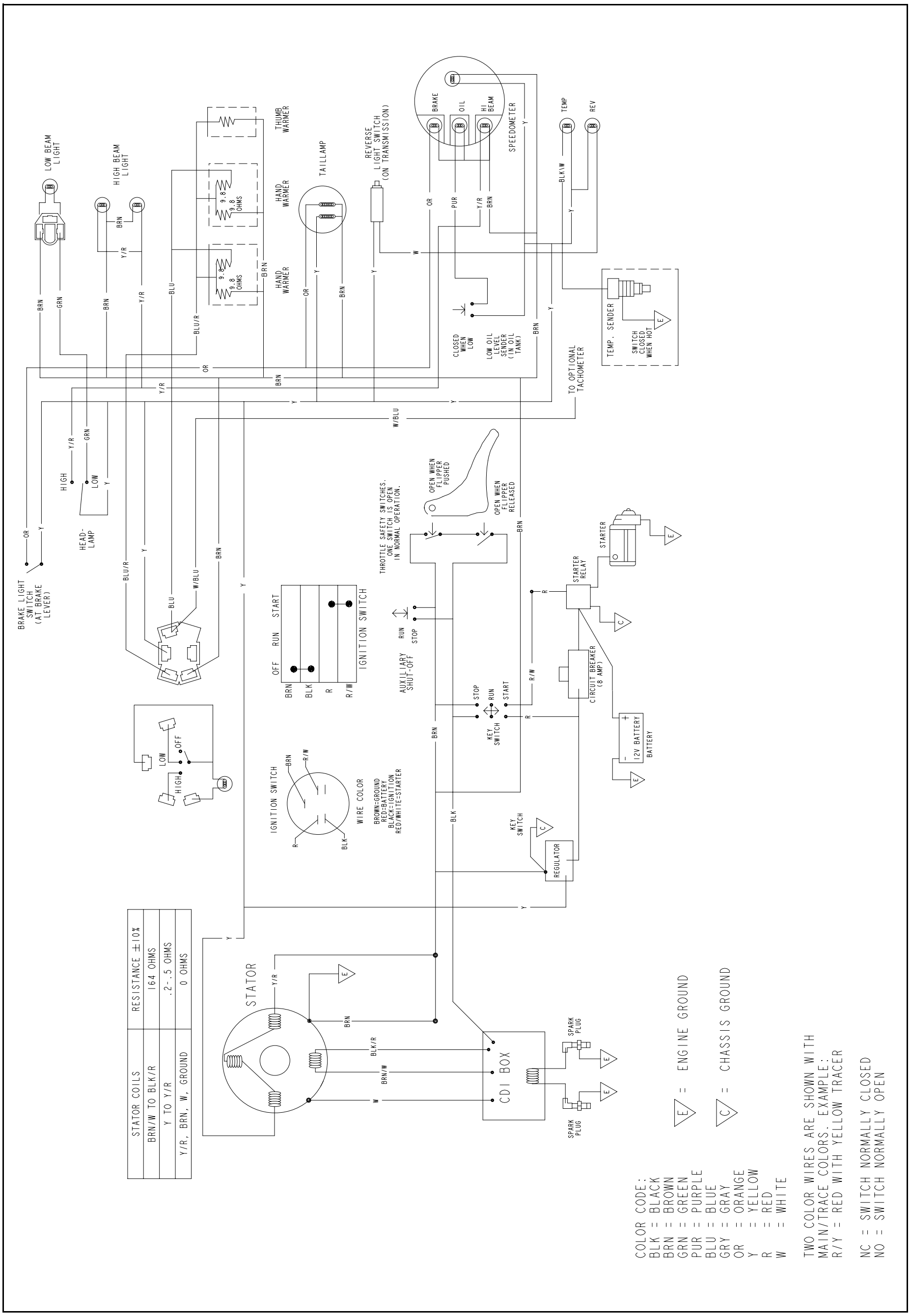
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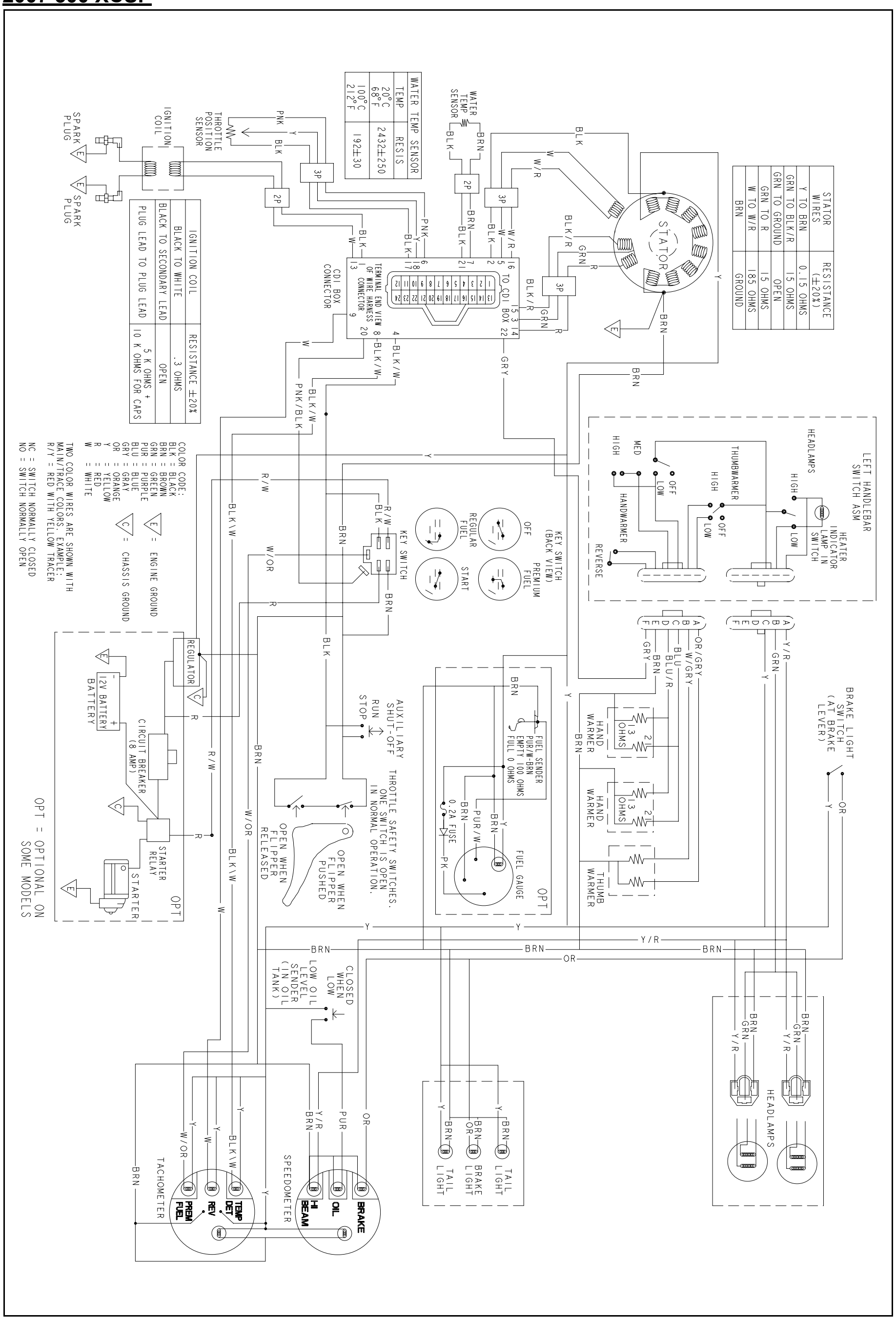


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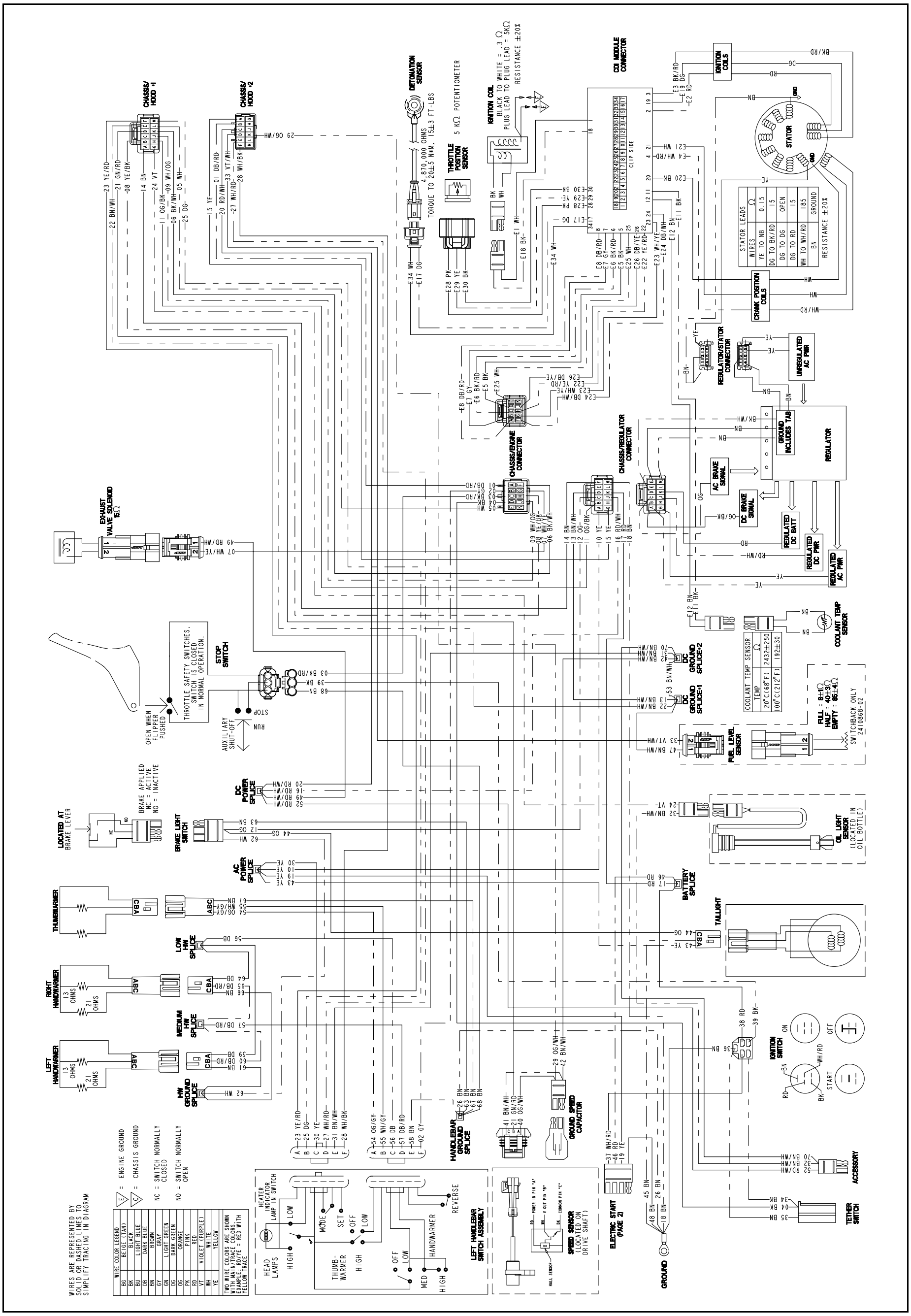


STATOR COILS	RESISTANCE ±10%
BRN/W TO BLK/R	164 OHMS
Y TO Y/R	.2-.5 OHMS
Y/R, BRN, W, GROUND	0 OHMS

2007 500 XCSP



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2007 600 HO Carbureted 2 of 2

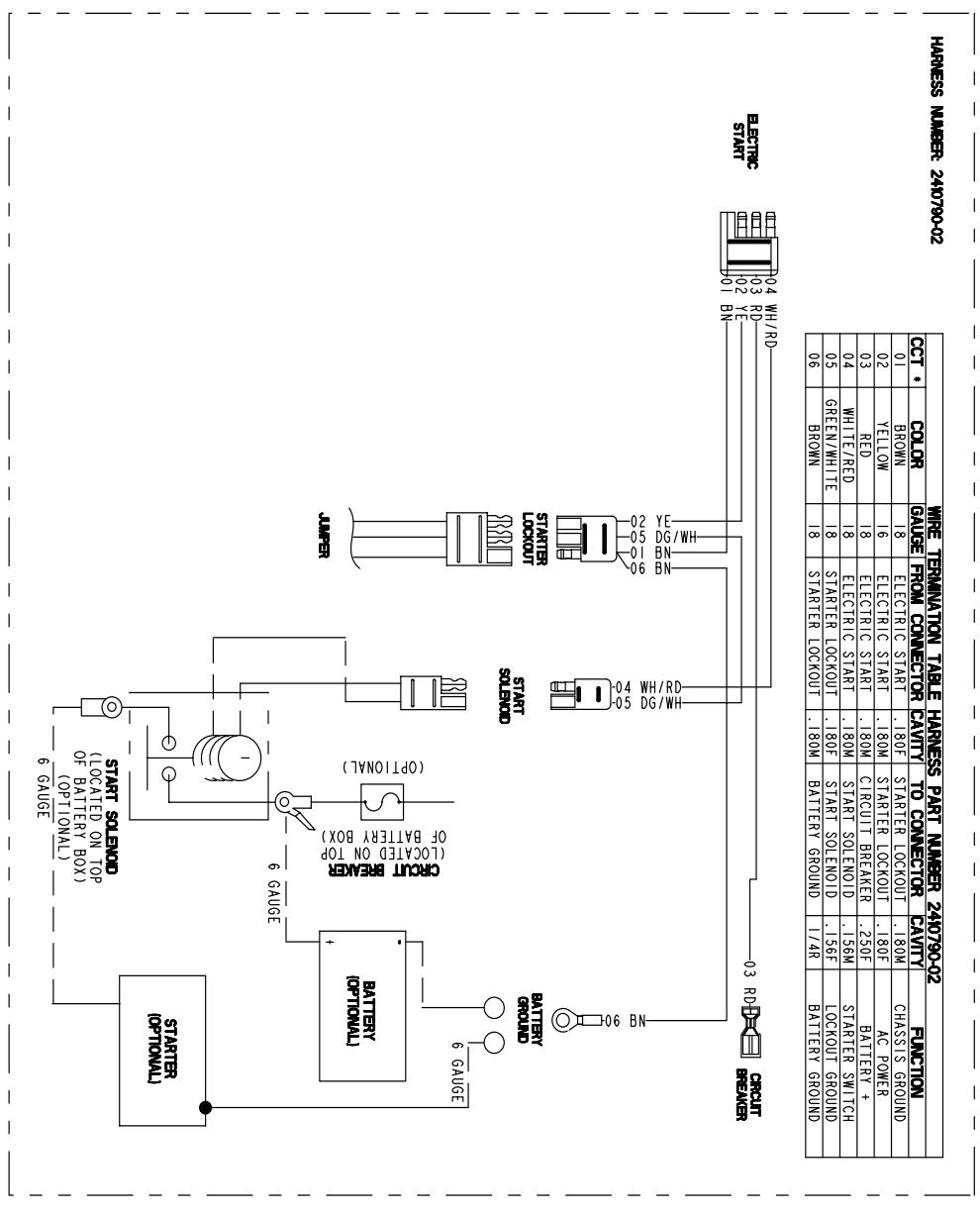
WIRE TERMINATION TABLE HARNESS PART NUMBER 2410729-03 & 2410868-01 **						
CCT NO	COLOR	WIRE GAUGE	FROM CONNECTOR	CAVITY	TO CONNECTOR	CAVITY
01	BLU/RED	18	CDI MODULE	A	CHASSIS/HOOD #2	B
02	GRAY	18	CDI MODULE	B	REVERSE SIGNAL	F
03	BLACK/RED	18	CDI MODULE	C	SOFT STOP	-
04	BLACK	18	CDI MODULE	D	HARD STOP	-
05	WHITE	18	CDI MODULE	E	CHASSIS/HOOD #1	L
06	BLACK/WHITE	18	CDI MODULE	F	CHASSIS/HOOD #1	K
07	WHITE/YELLOW	18	CDI MODULE	G	SOLENOID CONTROL	2
08	YELLOW/BLACK	18	CDI MODULE	H	TACHOMETER	B
09	WHITE/ORANGE	18	CDI MODULE	J	DETONATION LED	-
10	YELLOW	16	REGULATOR	A	AC POWER	-
11	ORANGE/BLACK	20	REGULATOR	B	DC BRAKE SIGNAL	H
12	ORANGE	18	REGULATOR	C	AC BRAKE SIGNAL	-
13	BROWN/WHITE	18	REGULATOR	D	DC GROUND	A
14	BROWN	16	REGULATOR	F	AC GROUND	A
15	YELLOW	16	REGULATOR	G	AC POWER	-
16	RED/WHITE	18	REGULATOR	J	DC POWER	-
17	RED	16	BATTERY SPLICE	-	BATTERY CHARGE	K
18	BROWN	16	REGULATOR	M	AC GROUND	I/4R
19	YELLOW	16	ELECTRIC START	.180F	AC POWER	-
20	RED/WHITE	18	DC POWER SPLICE	-	DC POWER	C
21	LT GREEN/RED	18	SPEED SENSOR	B	GROUND SPEED	D
22	BROWN/WHITE	18	DC GROUND SPLICE #1	-	DC GROUND	E
23	YELLOW/RED	16	LH CONTROL POWER	A	HIGH HEADLAMPS	F
24	VIOLET	18	OIL LEVEL	.180M	OIL LEVEL	G
25	GREEN	16	LH CONTROL POWER	B	LOW HEADLAMPS	M
26	BROWN	18	GROUND	I/4R	AC GROUND	HANDLEBAR GROUND SPLICE
27	WHITE/RED	20	LH CONTROL POWER	D	MODE SWITCH	-
28	WHITE/BLACK	20	LH CONTROL POWER	F	SET SWITCH	CHASSIS/HOOD #2
29	ORANGE/WHITE	20	CAPACITOR	.180F	SPEED SENSOR POWER	K
30	YELLOW	16	LH CONTROL POWER	C	AC POWER	-
31	BROWN/WHITE	18	LH CONTROL POWER	E	DC GROUND	DC GROUND SPLICE #2
32	BROWN/WHITE	18	ACCESSORY	.180M	DC GROUND	.180F
33 **	VIOLET/WHITE	20	FUEL LEVEL SENDER	A	FUEL SENDER	D
34 **	BLACK	18	TETHER	-	HARD STOP	-
35	BROWN	18	GROUND	I/4R	CHASSIS GROUND	-
36	BROWN	18	GROUND	I/4R	START SOLENOID CONTROL	-
37	WHITE/RED	20	ELECTRIC START	.180F	BATTERY CHARGE	-
38	RED	18	BATTERY SPLICE	-	HARD STOP	-
39	BLACK	18	STOP SWITCH	-	SET SWITCH	F
40	ORANGE/WHITE	20	CAPACITOR	.180F	SPEED SENSOR POWER	A
41	BROWN/WHITE	18	CAPACITOR	.180M	DC GROUND	C
42	BROWN/WHITE	18	CAPACITOR	.180M	AC POWER	DC GROUND SPLICE #2
43	YELLOW	18	AC POWER SPLICE	-	AC POWER	-
44	ORANGE	18	BRAKE SWITCH	.180F	AC BRAKE SIGNAL	A
45	BROWN	18	GROUND	I/4R	AC GROUND	A
46 **	RED	16	BATTERY SPLICE	-	BATTERY CHARGE	K
47 **	BROWN/WHITE	20-	FUEL LEVEL SENDER	B	DC GROUND SPLICE #1	.180F
48	BROWN	16	GROUND	I/4R	AC GROUND	A
49	RED/WHITE	18	DC POWER SPLICE	-	DC POWER	I
50	-	-	-	-	-	-
51	-	-	-	-	-	-
52	RED/WHITE	18	ACCESSORY	.180F	DC POWER	-
53	BROWN/WHITE	18	DC GROUND SPLICE #1	-	DC GROUND	DC GROUND SPLICE #2
54	ORANGE/GRAY	20	LH CONTROL SIGNAL	A	LOW THUMBWARMER	A
55	WHITE/GRAY	20	LH CONTROL SIGNAL	B	HIGH THUMBWARMER	B
56	BLUE	20	LH CONTROL SIGNAL	C	LOW HW SPLICE	-
57	BLUE/RED	20	LH CONTROL SIGNAL	D	MED HW SPLICE	-
58	BROWN	20	LH CONTROL SIGNAL	E	HANDLEBAR GROUND SPLICE	-
59	BLUE	20	LEFT HANDWARMER	A	LOW HW SPLICE	-
60	BLUE/RED	20	LEFT HANDWARMER	B	MED HW SPLICE	-
61	BROWN	20	LEFT HANDWARMER	C	HW GROUND SPLICE	-
62	WHITE	20	BRAKE SWITCH	.180F	AC GROUND	-
63	BROWN	18	BRAKE SWITCH	.180M	HANDLEBAR GROUND SPLICE	-
64	BLUE	20	RIGHT HANDWARMER	A	LOW HW SPLICE	-
65	BLUE/RED	20	RIGHT HANDWARMER	B	MED HW SPLICE	-
66	BROWN	20	RIGHT HANDWARMER	C	HW GROUND SPLICE	-
67	BROWN	20	THUMBWARMER	-	AC GROUND	-
68	BROWN	20	STOP SWITCH	-	AC GROUND	-
69	-	-	-	-	-	-
70	BROWN/WHITE	18	ACCESSORY	.180M	DC GROUND	-

WIRE TERMINATION TABLE HARNESS PART NUMBER 4011175-05						
CCT NO	COLOR	WIRE GAUGE	FROM CONNECTOR	CAVITY	TO CONNECTOR	FUNCTION
E1	WHITE	18	CDI MODULE	A	IGNITION COIL	IGNITION
E2	RED	18	CDI MODULE	B	EXCITER COIL	EXCITER COIL (+)
E3						
E4	WHITE/RED	18	CDI MODULE	C	CRANK SENSOR	PULSER COIL (+)
E5	BLK	18	CDI MODULE	D	CHASSIS/ENGINE	HARD STOP
E6	BLK/RED	18	CDI MODULE	E	CHASSIS/ENGINE	SOFT STOP
E7	GRY	18	CDI MODULE	F	CHASSIS/ENGINE	REVERSE SIGNAL
E8	BLU/RED	18	CDI MODULE	G	CHASSIS/ENGINE	WATER TEMP
E9						
E10						
E11	BLK	18	CDI MODULE	B	COOLANT SENSOR	WATER TEMP SIGNAL
E12	BRN	18	CDI MODULE	A	COOLANT SENSOR	WATER TEMP GND
E13						
E14						
E15						
E16						
E17	GRN	18	CDI MODULE	I	DET SENSOR	DET SENSOR GND
E18	BLK	18	CDI MODULE	-	IGNITION COIL	IGN COIL GND
E19	GRN	18	CDI MODULE	H	EXCITER COIL	EXCITER COIL (CENTER)
E20	BLK	18	CDI MODULE	-	CRANK SENSOR	STATOR GROUND
E21	WHITE	18	CDI MODULE	F	CRANK SENSOR	PULSER COIL (-)
E22	YELLOW/RED	18	CDI MODULE	-	CHASSIS/ENGINE	TACHOMETER
E23	WHITE/YELLOW	18	CDI MODULE	-	CHASSIS/ENGINE	EV SOLENOID GND
E24	BLU/WHITE	18	CDI MODULE	-	CHASSIS/ENGINE	HOT LED
E25	WHITE	18	CDI MODULE	-	CHASSIS/ENGINE	REVERSE LED
E26	BLU/YELLOW	18	CDI MODULE	-	CHASSIS/ENGINE	DET LED
E27						
E28	PINK	18	CDI MODULE	-	TPS SENSOR	TPS (5V)
E29	YELLOW	18	CDI MODULE	I/4R	TPS SENSOR	TPS SIGNAL
E30	BLACK	18	CDI MODULE	-	TPS SENSOR	TPS GND
E31						
E32						
E33						
E34	GREEN	18	CDI MODULE	-	DET SENSOR	DET SIGNAL

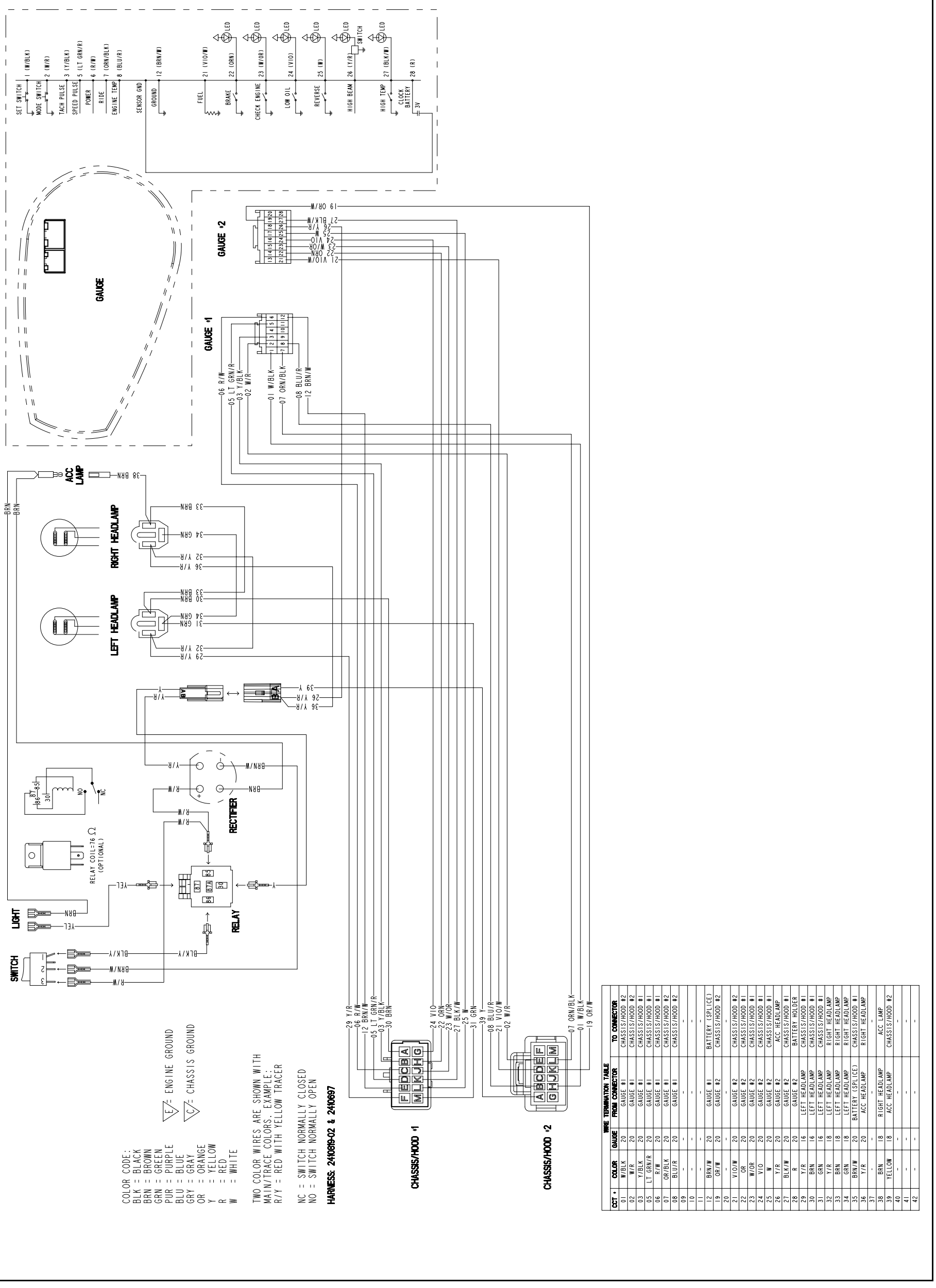
WIRE COLOR LEGEND	
BG	BEIGE (TAN)
BK	BLACK
BU	LIGHT BLUE
DB	DARK BLUE
BN	BROWN
GY	GRAY
GN	LIGHT GREEN
DG	DARK GREEN
OG	ORANGE
PK	PINK
RD	RED
VT	VIOLET (PURPLE)
WH	WHITE
YE	YELLOW
TWO WIRE COLORS ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE: RD/YE = RED WITH YELLOW TRACE	

WIRES ARE REPRESENTED BY SOLID OR DASHED LINES TO SIMPLIFY TRACING IN DIAGRAM

** HARNESS 2410868-01 ONLY



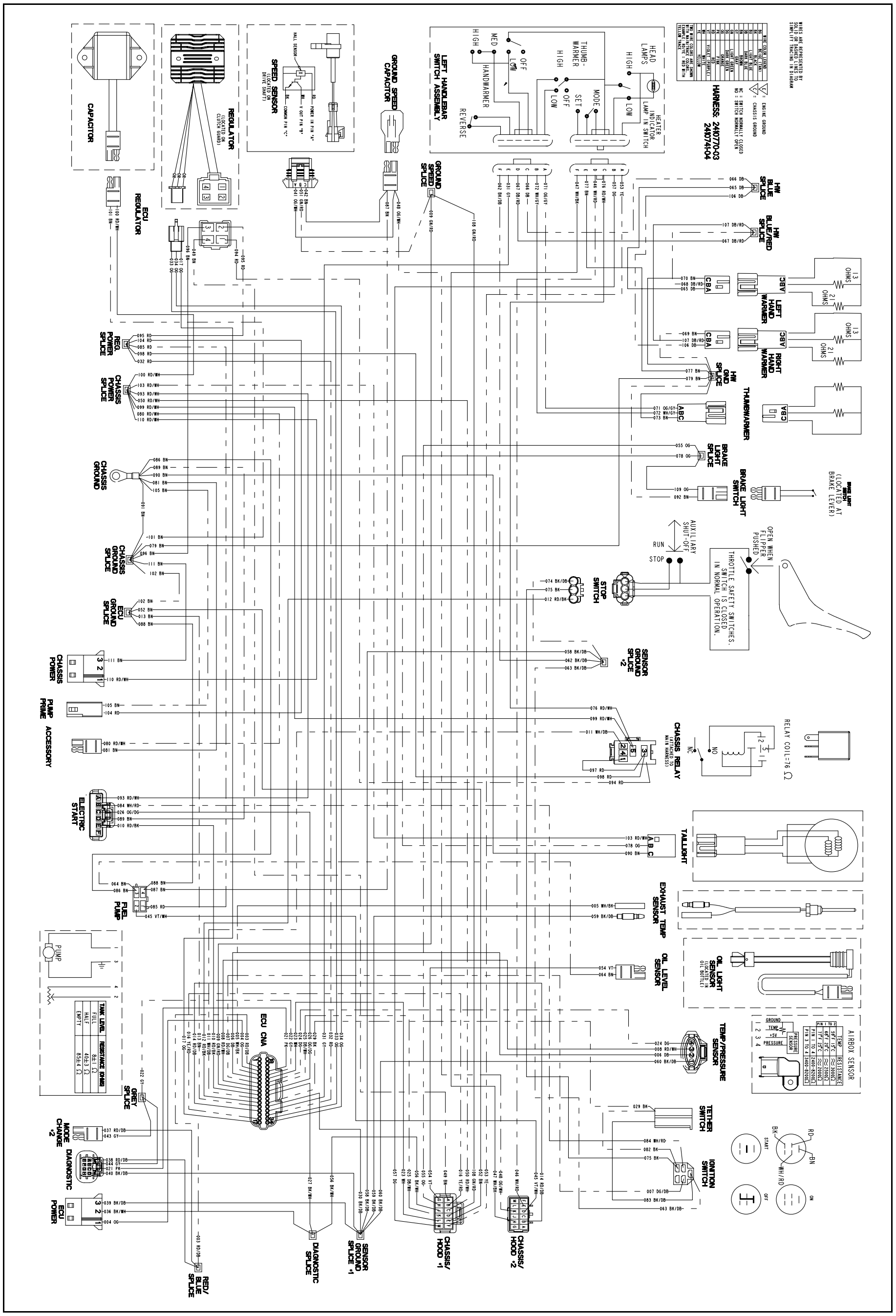
2007 600 HO Carbureted Hood Harness



WIRE TERMINATION TABLE

CCT #	COLOR	GAUGE	FROM CONNECTOR	TO CONNECTOR
01	W/BLK	20	GAUGE #1	CHASSIS/HOOD #2
02	W/R	20	GAUGE #1	CHASSIS/HOOD #2
03	Y/BLK	20	GAUGE #1	CHASSIS/HOOD #1
05	LT GRN/R	20	GAUGE #1	CHASSIS/HOOD #1
06	R/W	20	GAUGE #1	CHASSIS/HOOD #1
07	OR/BLK	20	GAUGE #1	CHASSIS/HOOD #2
08	BLU/R	20	GAUGE #1	CHASSIS/HOOD #2
09	-	-	-	-
10	-	-	-	-
11	-	-	-	-
12	BRN/W	20	GAUGE #1	BATTERY (SPLICE)
19	OR/W	20	GAUGE #2	CHASSIS/HOOD #2
20	-	-	-	-
21	V10/W	20	GAUGE #2	CHASSIS/HOOD #2
22	OR	20	GAUGE #2	CHASSIS/HOOD #1
23	W/OR	20	GAUGE #2	CHASSIS/HOOD #1
24	V10	20	GAUGE #2	CHASSIS/HOOD #1
25	W	20	GAUGE #2	CHASSIS/HOOD #1
26	Y/R	20	GAUGE #2	ACC HEADLAMP
27	BLK/W	20	GAUGE #2	CHASSIS/HOOD #1
28	R	20	GAUGE #2	BATTERY HOLDER
29	Y/R	16	LEFT HEADLAMP	CHASSIS/HOOD #1
30	BRN	16	LEFT HEADLAMP	CHASSIS/HOOD #1
31	GRN	16	LEFT HEADLAMP	CHASSIS/HOOD #1
32	Y/R	18	LEFT HEADLAMP	RIGHT HEADLAMP
33	BRN	18	LEFT HEADLAMP	RIGHT HEADLAMP
34	GRN	18	LEFT HEADLAMP	RIGHT HEADLAMP
35	BRN/W	20	BATTERY (SPLICE)	CHASSIS/HOOD #1
36	Y/R	20	ACC HEADLAMP	RIGHT HEADLAMP
37	-	-	-	-
38	BRN	18	RIGHT HEADLAMP	ACC LAMP
39	YELLOW	18	ACC HEADLAMP	CHASSIS/HOOD #2
40	-	-	-	-
41	-	-	-	-
42	-	-	-	-

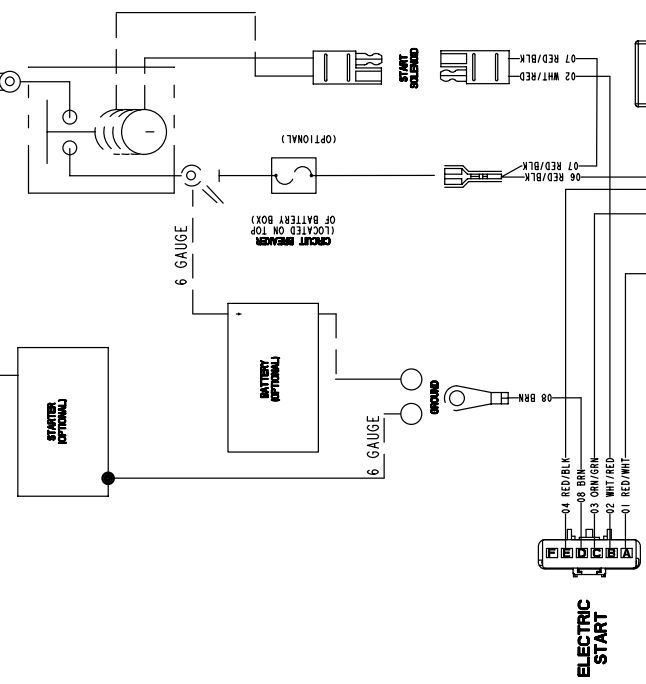
2007 600 / 700 CFI 1 of 2



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WIRE TERMINATION TABLE

CCT #	COLOR	GAUGE	FROM CONNECTOR	CAVITY	FUNCTION
02	-	-	-	-	-
03	RED/BLUE	20	ECU CNA	-	K LINE POWER
04	ORANGE	20TXL	ECU CNA	I	EXTERNAL POWER
05	WHITE/BLACK	20TXL	ECU CNA	.156F	EXHAUST TEMP SIGNAL
06	BLUE	20	ECU CNA	2	AIR TEMP SIGNAL
07	GREEN/BLUE	20	ECU CNA	-	STARTER LOCKOUT
08	RED/WHITE	20	ECU CNA	3	5V POWER
09	LT GREEN/RED	20	ECU CNA	-	GROUND SPEED
10	RED/BLACK	20	ECU CNA	E	BATTERY +
11	WHITE/BLUE	20TXL	ECU CNA	2	CHASSIS RELAY COIL
12	BLACK/RED	20	ECU CNA	-	SOFT STOP
13	BROWN	20	ECU CNA	-	ECU GROUND
14	BLUE/RED	20TXL	ECU CNA	B	WATER TEMP GAUGE
15	-	-	-	-	-
16	YELLOW/RED	20TXL	ECU CNA	B	TACHOMETER
17	ORANGE	20	ECU CNA	-	VOLTAGE BOOST
19	-	-	-	-	-
20	-	-	-	-	-
21	PINK	20TXL	ECU CNA	C	K LINE
22	GRAY	20	ECU CNA	-	MODE
23	WHITE	20TXL	ECU CNA	L	REVERSE LED
24	GREEN	20	ECU CNA	4	PRESSURE SENSOR SIGNAL
25	BLUE/WHITE	20TXL	ECU CNA	K	HOT DET LED
26	ORANGE/GREEN	20	ECU CNA	C	BATTERY RELAY COIL
27	BLACK/WHITE	20	ECU CNA	-	DIAGNOSTICS
29	BLACK	20	ECU CNA	-	HARD STOP
30	BLACK/BLUE	20	ECU CNA	-	SENSOR GROUND
31	GRAY	20	ECU CNA	E	REVERSE SIGNAL
32	RED	20	ECU CNA	-	REGULATOR POWER
33	ORANGE	20	ECU CNA	-	VOLTAGE BOOST
34	ORANGE	20	ECU CNA	-	VOLTAGE BOOST
35	-	-	-	-	-
36	BLACK/WHITE	18TXL	DIAGNOSTIC SPLICE	2	DIAGNOSTICS
37	RED/BLUE	18TXL	RED/BLUE SPLICE	.156F	K LINE POWER
38	RED/BLUE	18TXL	RED/BLUE SPLICE	A	K LINE POWER
39	BLACK/BLUE	18TXL	SENSOR GROUND SPLICE #1	3	SENSOR GROUND
40	BLACK/BLUE	18TXL	SENSOR GROUND SPLICE #1	D	SENSOR GROUND
41	ORANGE/WHITE	-	SPEED SENSOR	.180F	SPEED SENSOR POWER
42	BROWN	-	SPEED SENSOR	.180M	CHASSIS GROUND
43	GRAY	18TXL	GRAY SPLICE	.156M	MODE
44	GRAY	18TXL	GRAY SPLICE	B	MODE
45	VIOLET/WHITE	20TXL	CHASSIS/HOOD #2	D	FUEL LEVEL
46	WHITE/RED	20TXL	CHASSIS/HOOD #2	D	MODE SWITCH
47	WHITE/BLACK	20TXL	CHASSIS/HOOD #2	F	SET SWITCH
48	ORANGE/WHITE	20TXL	CHASSIS/HOOD #2	.180F	SPEED SENSOR POWER
49	BROWN	16TXL	CHASSIS/HOOD #1	4	CHASSIS GROUND
50	RED/WHITE	18TXL	CHASSIS/HOOD #1	-	CHASSIS POWER
51	LT GREEN/RED	18	GROUND SPEED SENSOR SPLICE	B	GROUND SPEED
52	BROWN	18TXL	CHASSIS/HOOD #1	-	ECU GROUND
53	YELLOW	16TXL	CHASSIS/HOOD #1	A	HIGH BEAM
54	VIOLET	20TXL	CHASSIS/HOOD #1	.180M	LOW OIL LED
55	ORANGE	20TXL	CHASSIS/HOOD #1	-	BRAKE LIGHT
56	BLACK/WHITE	18TXL	CHASSIS/HOOD #1	-	DIAGNOSTICS
57	GREEN	16TXL	CHASSIS/HOOD #1	B	LOW BEAM
58	BLACK/BLUE	18	SENSOR GROUND SPLICE #2	-	SENSOR GROUND
59	BLACK/BLUE	18TXL	SENSOR GROUND SPLICE #1	.156M	SENSOR GROUND
60	BLACK/BLUE	18	SENSOR GROUND SPLICE #1	I	SENSOR GROUND
61	-	-	-	-	-
62	BLACK/BLUE	20	SENSOR GROUND SPLICE #2	F	SENSOR GROUND
63	BLACK/BLUE	18	SENSOR GROUND SPLICE #2	C	SENSOR GROUND
64	BROWN	20	FUEL PUMP	.180F	SENSOR GROUND
65	BLUE	20	LEFT HANDWARMER	-	CHASSIS GROUND
66	BLUE	20	LH CONTROL SIGNAL	-	HANDWARMER LOW
67	BLUE/RED	20	LH CONTROL SIGNAL	-	HANDWARMER LOW
68	BLUE/RED	20	LEFT HANDWARMER	-	HANDWARMER HI
69	BROWN	18	RIGHT HANDWARMER	-	HANDWARMER HI
70	BROWN	18	LEFT HANDWARMER	-	CHASSIS GROUND
71	ORANGE/GRAY	20	LH CONTROL SIGNAL	-	CHASSIS GROUND
72	WHITE/GRAY	20	LH CONTROL SIGNAL	A	THUMBWARMER HI
73	BROWN	18	HANDLEBAR GROUND SPLICE	B	THUMBWARMER HI
74	BLACK/BLUE	18	STOP SWITCH	C	CHASSIS GROUND
75	BLACK	20	STOP SWITCH	-	SENSOR GROUND
76	RED/WHITE	16TXL	CHASSIS RELAY	C	CHASSIS POWER
77	BROWN	20	HANDLEBAR GROUND SPLICE	E	CHASSIS GROUND
78	ORANGE	18	BRAKE SWITCH SPLICE	B	BRAKE LIGHT
79	RED/WHITE	16	CHASSIS GROUND SPLICE	-	REGULATOR POWER
80	BROWN	16	CHASSIS GROUND	I/4R	CHASSIS GROUND
81	BROWN	16	CHASSIS GROUND	.180M	CHASSIS GROUND
82	BLACK	20	IGNITION SWITCH	-	ECU GROUND
83	BLACK/BLUE	18	IGNITION SWITCH	C	CHASSIS GROUND
84	WHITE/RED	20	IGNITION SWITCH	-	STARTER SOLENOID GROUND
85	RED	18	FUEL PUMP	-	CHASSIS GROUND
86	BROWN	18	FUEL PUMP	B	HARD STOP
87	BROWN	20	FUEL PUMP	-	REGULATOR POWER
88	BROWN	20	FUEL PUMP	I/4R	CHASSIS GROUND
89	BROWN	16	CHASSIS GROUND	-	ECU GROUND
90	BROWN	18	CHASSIS GROUND	I/4R	CHASSIS GROUND
91	BROWN	16	CHASSIS GROUND	I/4R	CHASSIS GROUND
92	BROWN	18	BRAKE SWITCH	.180F	CHASSIS GROUND
93	RED/WHITE	16	ELECTRIC START	I/4R	BATTERY GROUND
94	RED	16TXL	REGULATOR	-	REGULATOR POWER
95	RED	16	REGULATOR	-	REGULATOR POWER
96	BROWN	16	REGULATOR	-	CHASSIS GROUND
97	RED	20TXL	CHASSIS RELAY	3	CHASSIS POWER
98	RED	16TXL	CHASSIS RELAY	-	REGULATOR POWER
99	RED/WHITE	16TXL	CHASSIS RELAY	-	CHASSIS POWER
100	RED/WHITE	16	CAPACITOR	-	CHASSIS POWER
101	BROWN	16	CAPACITOR	.156F	CHASSIS GROUND
102	BROWN	18	CHASSIS GROUND SPLICE	-	CHASSIS GROUND
103	RED/WHITE	18	CHASSIS POWER SPLICE	-	ECU GROUND
104	RED	18TXL	PUMP PRIME	A	CHASSIS POWER
105	BROWN	18TXL	PUMP PRIME	I/4R	CHASSIS GROUND
106	BLUE	20	RIGHT HANDWARMER	-	REGULATOR POWER
107	BLUE/RED	20	RIGHT HANDWARMER	-	HANDWARMER LOW
108	LT GREEN/RED	18TXL	CHASSIS/HOOD #1	-	HANDWARMER HI
109	ORANGE	18	BRAKE SWITCH	.180F	GROUND SPEED
110	RED/WHITE	16TXL	CHASSIS POWER	-	BRAKE LIGHT
111	BROWN	16TXL	CHASSIS POWER	-	CHASSIS GROUND

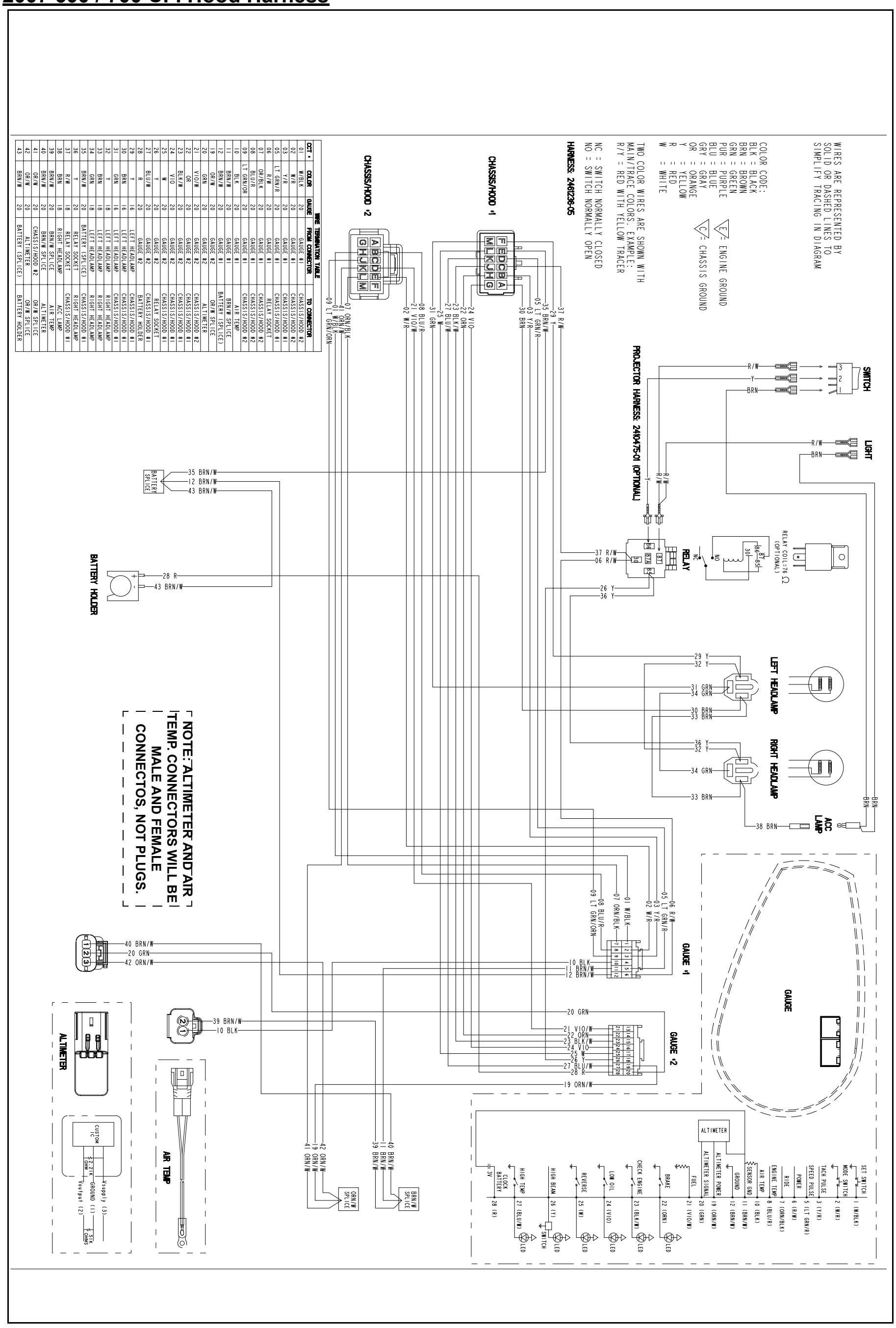


WIRE TERMINATION TABLE (ELECTRIC START)

GAUGE	FROM CONNECTOR	CAVITY	TO CONNECTOR	CAVITY	FUNCTION
16	ELECTRIC START	A	CHARGE RELAY	3	CHASSIS POWER
20	ELECTRIC START	B	START SOLENOID	.156M	STARTER SWITCH
20	ELECTRIC START	C	CHARGE RELAY	2	CHARGE RELAY CONTROL
20	ELECTRIC START	E	CHARGE RELAY	5	BATTERY +
20	CHARGE RELAY	I	CHARGE RELAY	3	CHASSIS POWER
16	CHARGE RELAY	5	CIRCUIT BREAKER	.250F	BATTERY +
20	CIRCUIT BREAKER	.250F	START SOLENOID	.156F	BATTERY +
16	ELECTRIC START	D	BATTERY GROUND	I/4R	BATTERY GROUND

CCT #	COLOR	GAUGE
01	RED/WHITE	16
02	WHITE/RED	20
03	ORANGE/GREEN	20
04	RED/BLACK	20
05	RED/WHITE	20
06	RED/BLACK	16
07	RED/BLACK	20
08	BROWN	16

2007 600 / 700 CFI Hood Harness



CCT #	COLOR	WIRE GAUGE	TERMINATION TABLE FROM CONNECTOR	TO CONNECTOR
01	W/BLK	20	GAUGE #1	CHASSIS/HOOD #2
02	W/R	20	GAUGE #1	CHASSIS/HOOD #2
03	Y/R	20	GAUGE #1	CHASSIS/HOOD #1
05	LT GRN/R	20	GAUGE #1	CHASSIS/HOOD #1
06	R/W	20	GAUGE #1	CHASSIS/HOOD #1
07	ORN/BLK	20	GAUGE #1	RELAY SOCKET
08	BLU/R	20	GAUGE #1	CHASSIS/HOOD #2
09	LT GRN/ORN	20	GAUGE #1	CHASSIS/HOOD #2
10	BLK	20	GAUGE #1	AIR TEMP
11	BRN/W	20	GAUGE #1	BRN/W SPLICE
12	BRN/W	20	GAUGE #1	BATTERY (SPLICE)
19	ORN/W	20	GAUGE #2	ALTIMETER
20	GRN	20	GAUGE #2	CHASSIS/HOOD #2
21	VIO/W	20	GAUGE #2	CHASSIS/HOOD #2
22	ORN	20	GAUGE #2	CHASSIS/HOOD #1
23	BLK/W	20	GAUGE #2	CHASSIS/HOOD #1
24	VIO	20	GAUGE #2	CHASSIS/HOOD #1
25	W	20	GAUGE #2	CHASSIS/HOOD #1
26	Y	20	GAUGE #2	RELAY SOCKET
27	BLU/W	20	GAUGE #2	CHASSIS/HOOD #1
28	R	20	GAUGE #2	BATTERY HOLDER
29	Y	16	LEFT HEADLAMP	CHASSIS/HOOD #1
30	BRN	16	LEFT HEADLAMP	CHASSIS/HOOD #1
31	GRN	16	LEFT HEADLAMP	CHASSIS/HOOD #1
32	Y	18	LEFT HEADLAMP	RIGHT HEADLAMP
33	BRN	18	LEFT HEADLAMP	RIGHT HEADLAMP
34	GRN	18	LEFT HEADLAMP	RIGHT HEADLAMP
35	BRN/W	20	BATTERY (SPLICE)	CHASSIS/HOOD #1
36	Y	20	RELAY SOCKET	RIGHT HEADLAMP
37	R/W	18	RELAY SOCKET	CHASSIS/HOOD #1
38	BRN	18	RIGHT HEADLAMP	ACC LAMP
39	BRN/W	20	BRN/W SPLICE	ALTIMETER
40	BRN/W	20	BRN/W SPLICE	ALTIMETER
41	ORN/W	20	CHASSIS/HOOD #2	ORN/W SPLICE
42	ORN/W	20	ALTIMETER	ORN/W SPLICE
43	BRN/W	20	BATTERY (SPLICE)	BATTERY HOLDER