CHAPTER 1
GENERAL INFORMATION

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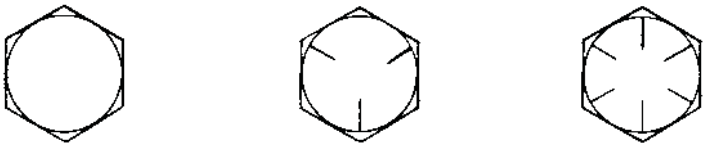
STANDARD TORQUE SPECIFICATIONS

The following torque specifications are to be used as a general guideline. There are exceptions in the steering, suspension, and engine areas. Always consult the exploded views in each manual section for torque values of fasteners before using standard torque.



Bolt Size	Threads/In	Grade 2	Grade 5	Grade 8
		Torque in. lbs. (kg-m)		
#10 -	24	27 (.31)	43 (.50)	60 (.69)
#10 -	32	31 (.36)	49 (.56)	68 (.78)
		Torque ft. lbs. (kg-m)*		
1/4 -	20	5 (.7)	8 (1.1)	12 (1.6)
1/4 -	28	6 (.8)	10 (1.4)	14 (1.9)
5/16 -	18	11 (1.5)	17 (2.3)	25 (3.5)
5/16 -	24	12 (1.6)	19 (2.6)	29 (4.0)
3/8 -	16	20 (2.7)	30 (4.0)	45 (6.2)
3/8 -	24	23 (3.2)	35 (4.8)	50 (6.9)
7/16 -	14	30 (4.0)	50 (6.9)	70 (9.7)
7/16 -	20	35 (4.8)	55 (7.6)	80 (11.0)
1/2 -	13	50 (6.9)	75 (10.4)	110 (15.2)
1/2 -	20	55 (7.6)	90 (12.4)	120 (16.6)

Metric

6 x 1.0	72-78 In. lbs.
8 x 1.25	14-18 ft. lbs.
10 x 1.25	26-30 ft. lbs.

***To convert ft. lbs. to kg-m multiply foot pounds by .138.
***To convert kg-m to N/m move the decimal to the right one position.

SPECIFIC TORQUE VALUES OF FASTENERS
Refer to exploded views in the appropriate section.

PERIODIC MAINTENANCE CHART

Inspection, adjustment and lubrication intervals of important components are listed in the following chart. Maintenance intervals are based upon average riding conditions and an assumed vehicle speed of approximately 10 MPH.

Inspect, clean, lubricate, adjust or replace parts as necessary. **NOTE:** Inspection may reveal the need for replacement parts. Always use genuine Polaris parts.

■ **CAUTION: Due to the nature of these adjustments, it is recommended that service be performed by an authorized Polaris dealer.**

▶ **Vehicles subjected to severe use (operation in wet or dusty areas, low speed heavy load operation, prolonged idle) should be inspected and serviced more frequently. For engine oil, short trip cold weather riding also constitutes severe use**. Pay special attention to oil level. A rise in oil level in cold weather can indicate moisture collecting in the oil tank (425). Change oil immediately if oil level begins to rise.

E Emission Control System Service (California).

PERIODIC MAINTENANCE - ENGINE / COOLING SYSTEM					
		Frequency (Whichever comes first)			
	Item	Hours	Calendar	Miles (Km)	Remarks
E▶	Engine Oil - Level/Change	100 hrs	6 months	1000 (1600)	Check Level Daily; Break In service at 1 month / 25 hrs / 250 miles
E	Oil Filter	100 hrs	6 months	1000 (1600)	Replace with oil change
E▶	Air Filter - Foam Pre-Cleaner	Daily	Daily		Inspect-Clean & oil more often in dirty conditions.
E▶	Air Filter - Main Element	Weekly	Weekly		Inspect - Replace if necessary
▶	Air Box Sediment Tube		Daily		Drain deposits whenever visible
E■	Valve Clearance	100 hrs	12 months	1000 (1600)	Inspect/Adjust
	Clutch Adjustment	50 hrs	6 months	500 (800)	Inspect/Adjust
	Oil Cooler	50 hrs	6 months	500 (800)	Inspect / Clean external surface
	Oil Cooler Hoses	100 hrs	12 months	1000 (1600)	Inspect
	Engine Mounts	100 hrs	12 months	1000 (1600)	Inspect
	Drain Recoil Housing	Weekly	Weekly		More often if operating in wet environment
	Exhaust Muffler / Pipe	100 hrs	12 months	1000 (1600)	
FUEL SYSTEM / CARBURETION					
E	Idle Speed	As required	As required		Adjust
■	Throttle Cable / ETC Switch	50 hrs	6 months	500 (800)	Inspect -Adjust, Lubricate, Replace if necessary
	Choke (Enricher) Cable	50 hrs	6 months	500 (800)	Inspect -Adjust, Lubricate, Replace if necessary
	Carburetor Float Bowl	50 hrs	6 months	500 (800)	Drain bowl periodically and prior to storage
	Carburetor Air Intake Ducts/ Flange	50 hrs	6 months	500 (800)	Inspect all ducts for proper sealing/ air leaks
E■	Fuel System	100 hrs	12 months	1000 (1600)	Check for leaks at tank cap, lines, fuel valve, filter, pump & carburetor. Replace lines every 2 years.
E■	Fuel Filter	100 hrs	12 months	1000 (1600)	Replace filter annually
ELECTRICAL					
E	Spark Plug	100 hrs	12 months	1000 (1600)	Inspect - Replace if necessary
	Wiring	100 hrs	12 months	1000 (1600)	Inspect for abrasion, routing, security
	Ignition Timing	100 hrs	12 months	1000 (1600)	Inspect
	Battery	20 hrs	Monthly	200 (320)	Check terminals; Clean; Check fluid level
	Headlight Aim	As required	As required		Adjust if Necessary
	Headlamp Inspection	Daily	Daily		Check operation daily; Apply Polaris Dielectric Grease to connector when lamp is replaced
	Tail Lamp Inspection	Daily	Daily		Check Operation Daily; Apply Polaris Dielectric Grease to socket when lamp is replaced

THROTTLE OPERATION

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

1. Place the gear selector in neutral.
2. Set parking brake.
3. Start the engine and let it idle.
4. Turn handlebars from full right to full left. If idle speed increases at any point in the turning range, inspect throttle cable routing and condition. If cable is routed properly and in good condition, repeat adjustment procedure.
5. Replace the throttle cable if worn, kinked, or damaged.

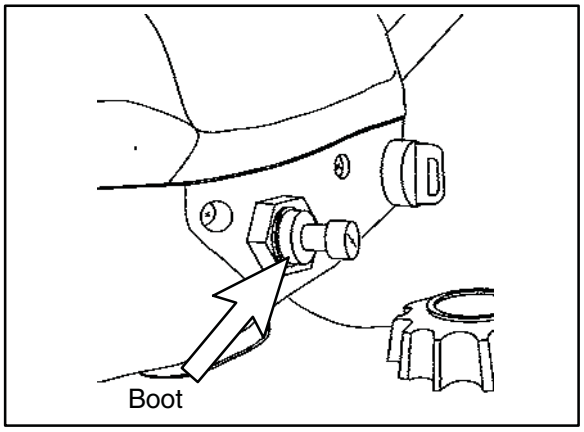
CHOKE (ENRICHER) ADJUSTMENT

If the choke knob does not stay out when pulled, adjust the choke tension by tightening the rubber boot located between the choke knob and nut. Firmly grasp the rubber boot and tighten until the choke slides freely but stays out when pulled.

Verify free play of 1/16–3/16" (1.6–4.76 mm) and smooth operation of choke cable.

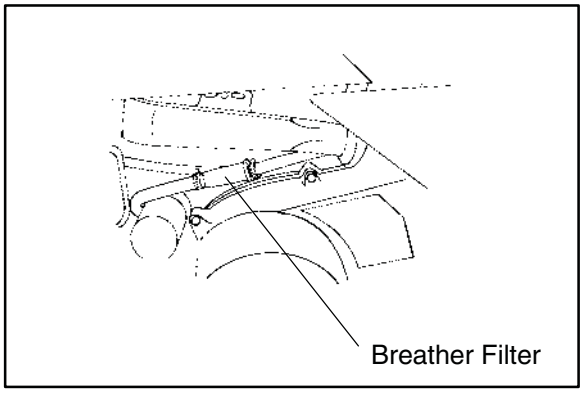
If smooth choke operation is not obtainable, inspect choke cable for kinks or sharp bends in routing.

NOTE: Illustration of choke varies with models.



BREATHER FILTER (XPEDITION 425)

1. The engine breather filter should be inspected when the air filters are serviced. Replace if dirty or restricted.
2. Slide clamps back and remove filter.
3. Replace filter with directional arrow pointing to engine (away from air box).
4. Reinstall clamps. **NOTE:** Replace clamps if they have lost spring tension.

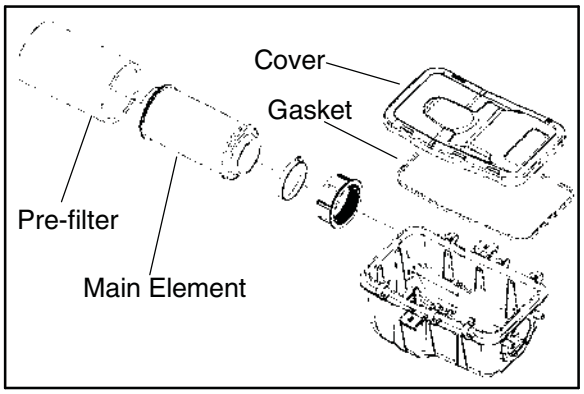


AIR FILTER / PRE-FILTER SERVICE

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

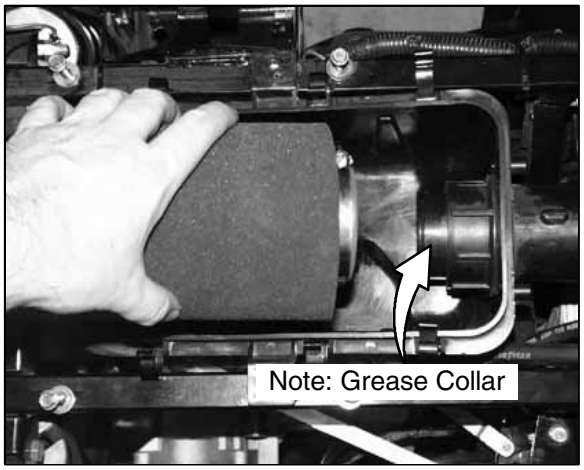
The pre filter should be cleaned before each ride, using the following procedure.

1. Lift up on the rear of the seat.
2. Pull the seat back and free of the tabs. **NOTE:** When reinstalling seat, make sure the slots in the seat engage the tabs in the fuel tank.
3. Remove clips (6) from air box cover and remove cover. Inspect the gasket. It should adhere tightly to the cover and seal all the way around.
4. Loosen clamp and remove air filter assembly.



Cleaning

5. Slip the pre-filter element off of main element. Clean the pre filter with high flash point solvent, followed by hot soapy water.
6. Rinse and dry thoroughly.
7. Inspect element for tears or damage.
8. Apply foam filter oil or clean engine oil and squeeze until excess oil is removed.
9. Inspect main element and replace if necessary. If the filter has been soaked with fuel or oil it must be replaced.



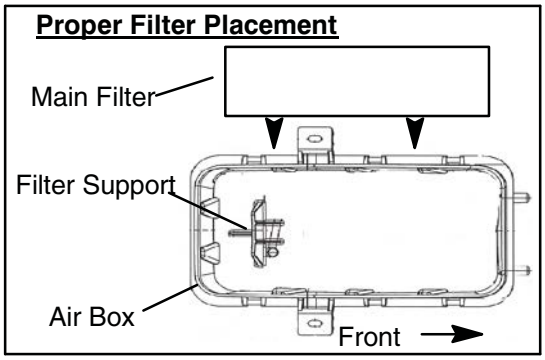
Installation

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

NOTE: The air filter should rest on the filter support. Proper placement of the air filter is important to prevent rattles and air leaks. See Illustration.

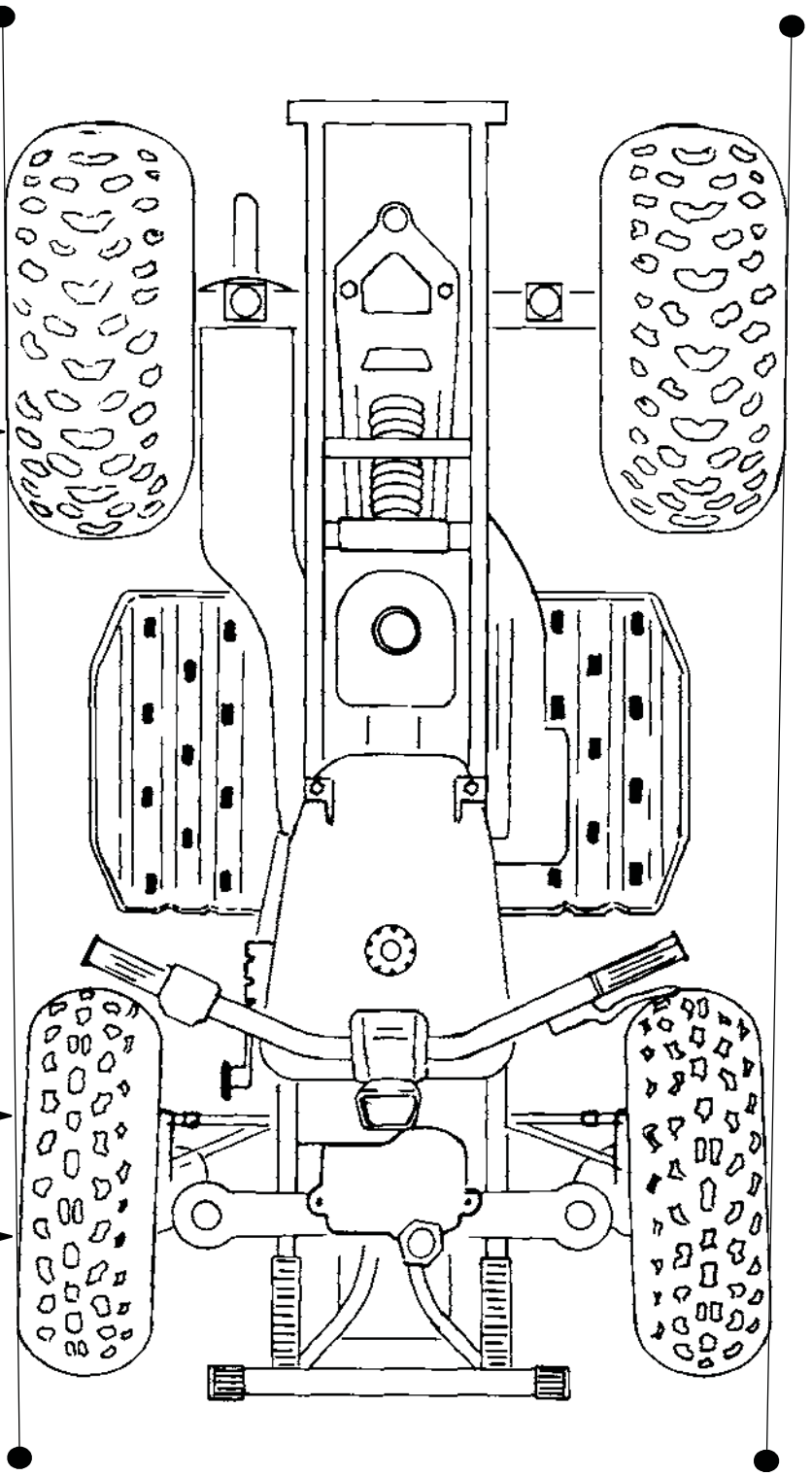
11. Install air box cover and secure with clips.

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



TOE ALIGNMENT – METHOD 1: STRAIGHTEDGE OR STRING

Be sure to keep handlebars centered. See note below.



NOTE: The steering post arm (frog) can be used as an indicator of whether the handlebars are straight. The frog should always point straight back from the steering post when handlebars are straight.

CHAPTER 3
ENGINE / GENERAL

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RECOMMENDED COOLANT – XPEDITION 425

Use only high quality antifreeze/coolant mixed with *distilled* water in a 50/50 or 60/40 ratio, depending on freeze protection required in your area. **CAUTION:** Using tap water in the cooling system will lead to a buildup of deposits which may restrict coolant flow and reduce heat dissipation, resulting in possible engine damage. Polaris Premium 60/40 Antifreeze/Coolant is recommended for use in all cooling systems, and comes pre-mixed and ready to use.

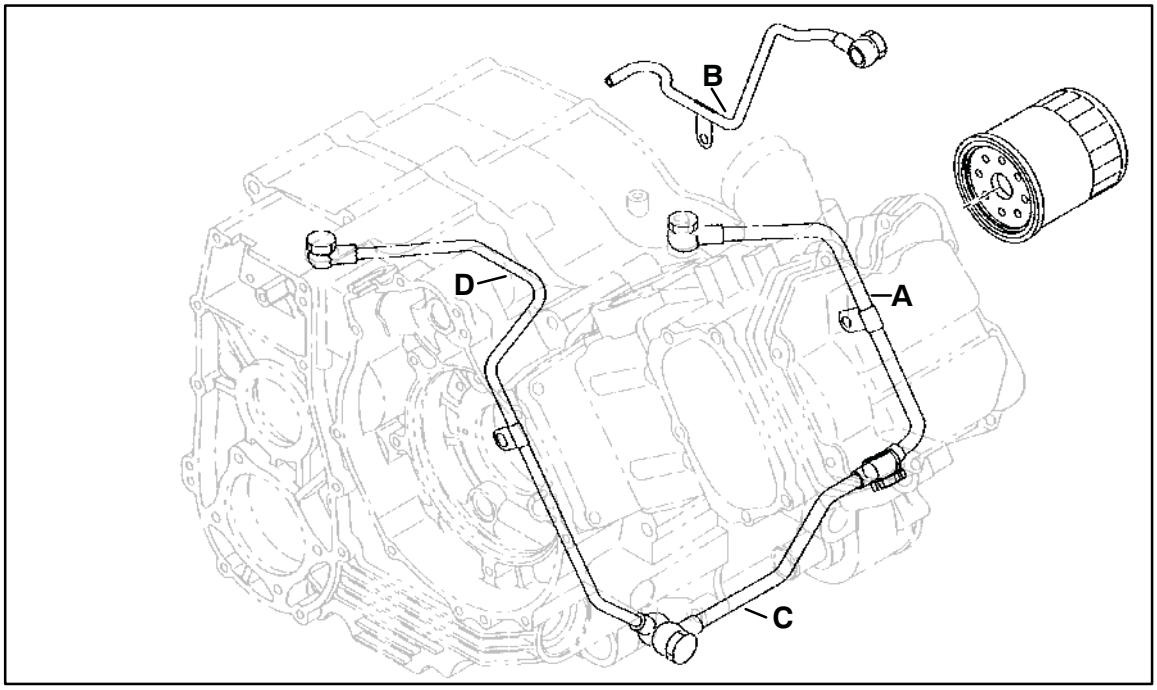
COOLING SYSTEM SPECIFICATIONS – XPEDITION 425

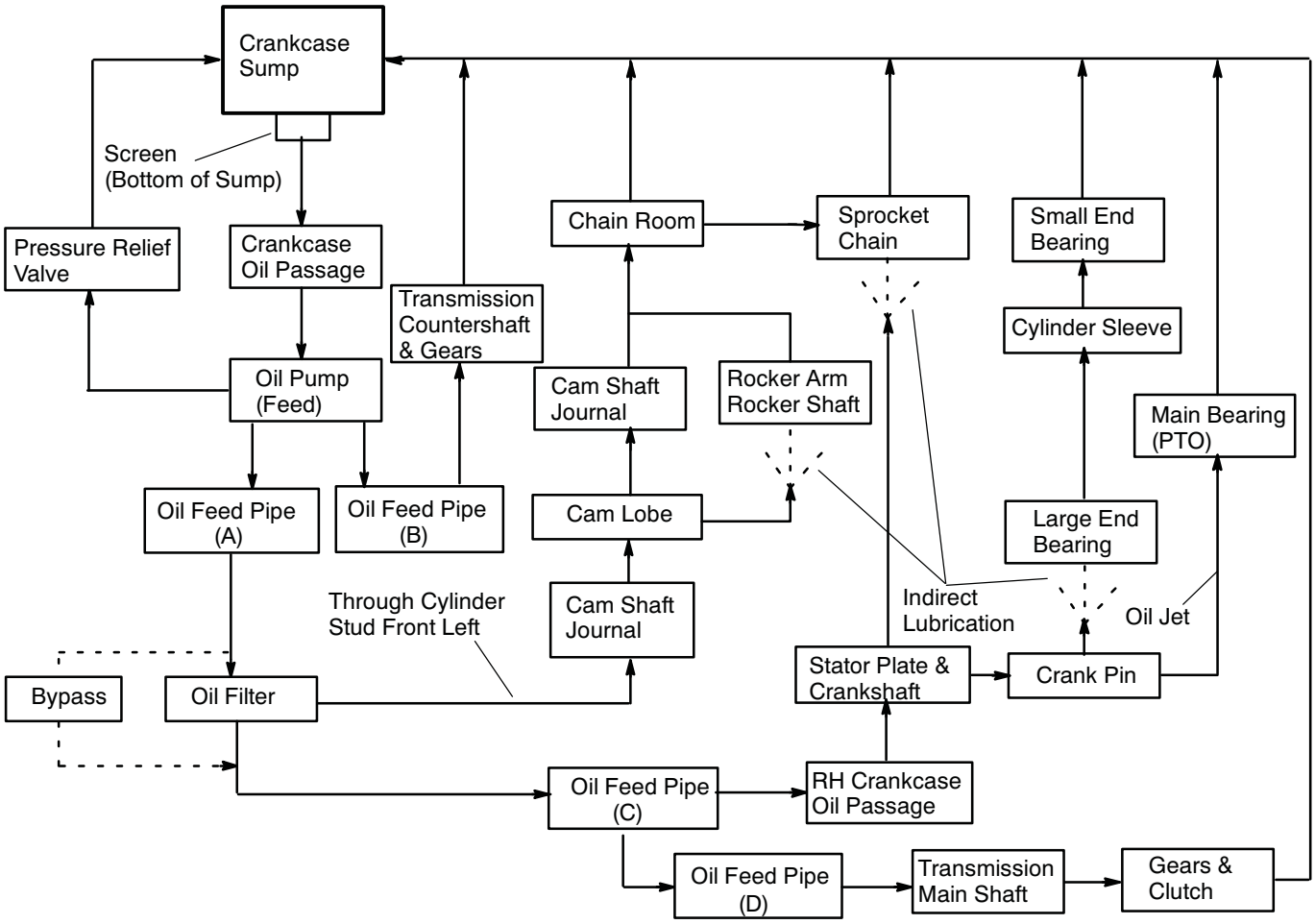
Fan Switch (Off) Fan Switch (On)	165° F (74° C) ± 8° 185° F (85° C) ± 7°
Hot Light On	221° F (105° C)
System Capacity	2.25 Quarts
Radiator Cap Relief Pressure	13 PSI
Thermostat	Starts opening 176° F (80° C) Open 8mm @ 205° F (96° C)

COOLING SYSTEM BLEEDING – XPEDITION 425

Refer to Maintenance section Page 2.19

EH42PLE04 OIL FLOW DIAGRAM



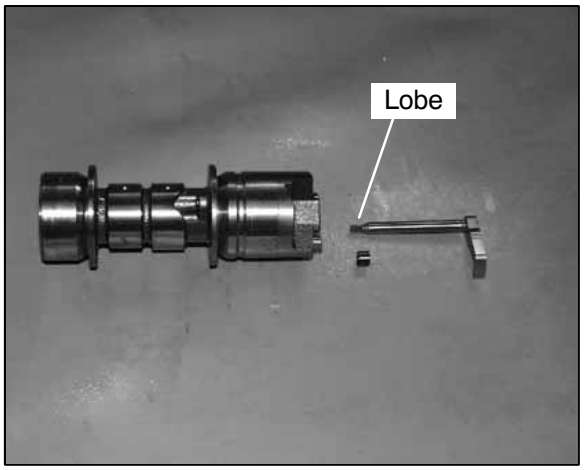


ES32PF Upper-Engine Service

AUTOMATIC COMPRESSION RELEASE REMOVAL/INSPECTION

NOTE: The automatic compression release mechanism can be inspected and serviced without removing the camshaft from the cylinder head.

1. Check release lever shaft for smooth operation throughout the entire range of rotation.
2. Remove release lever shaft and return spring (spacer).
3. Inspect shaft for wear or galling.
4. Inspect lobe on end of release lever shaft for wear and replace if necessary.

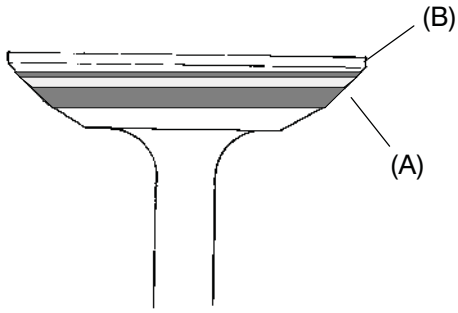


AUTOMATIC COMPRESSION RELEASE INSTALLATION

1. Slide spring onto shaft.
2. Apply engine oil to release lever shaft.

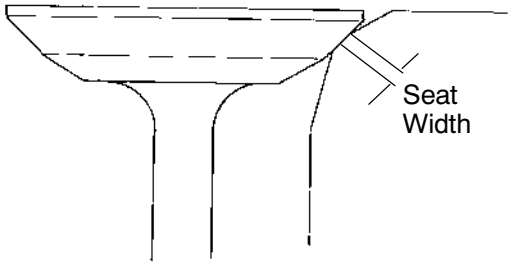
VALVE SEAT RECONDITIONING, CONT.

7. Remove valve and check where the Prussian Blue™ or black marker indicates seat contact on the valve face. The valve seat should contact the middle of the valve face or slightly above, and must be the proper width (A).
   - If the indicated seat contact is at the top edge of the valve face and contacts the margin area (B) it is too high on the valve face. Use the 30° cutter to lower the valve seat.
   - If too low use the 60° or 75° cutter to raise the seat. When contact area is centered on the valve face, measure seat width.
   - If the seat is too wide or uneven, use both top and bottom cutters to narrow the seat.
   - If the seat is too narrow, widen using the 45° cutter and re-check contact point on the valve face and seat width after each cut.



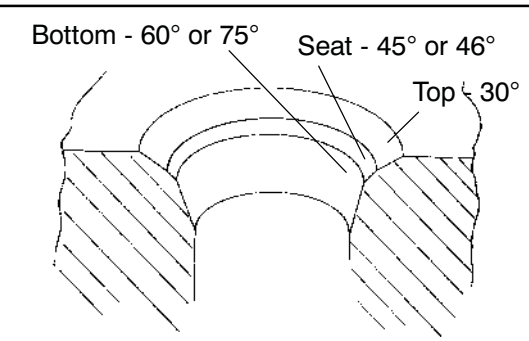
Proper Seat Contact On Valve Face

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



Valve Seat Width:

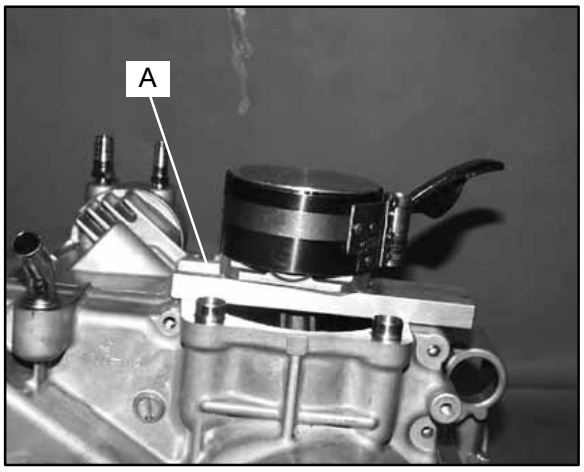
Intake Std: .039″ (1.0 mm)
Limit: .055″ (1.4 mm)
Exhaust Std: .059″ (1.4 mm)
Limit: .071″ (1.8 mm)



8. Clean all filings from the area with hot soapy water, rinse, and dry with compressed air.
9. Lubricate the valve guides with clean engine oil, and apply oil or water based lapping compound to the face of the valve. Lapping is not required with an interference angle.

CYLINDER INSTALLATION

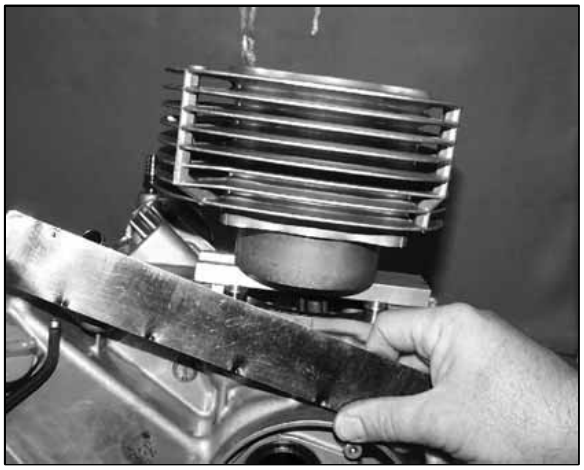
1. Position the piston support block **PN 2870390** (A) beneath the piston skirt to support the piston during cylinder installation.
2. Apply clean engine oil to the ring compressor (Snap On™ PN RCL30 or equivalent) and install the compressor following manufacturer's instructions. Verify all ring end gaps are correctly located.



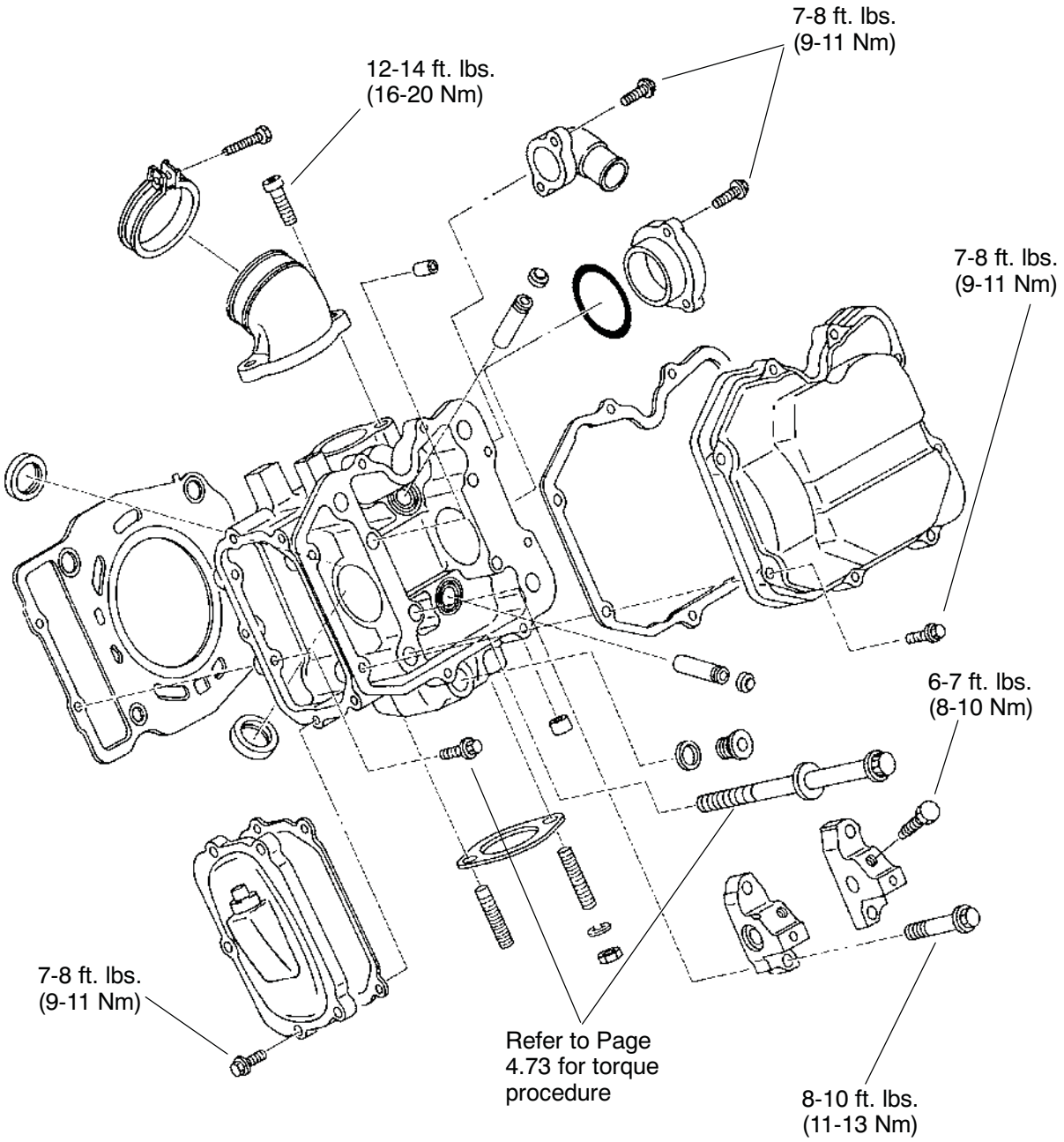
3. Apply clean engine oil liberally to the cylinder bore and tapered area of the sleeve. Install the cylinder with a slight rocking motion until the rings are captive in the sleeve.
4. Remove the ring compressor and support block.
5. Push the cylinder downward until fully seated on the base gasket.

NOTE: If cam chain is installed, hold it up while rotating the engine to avoid damage to the chain, drive sprocket teeth, or tensioner blade.

6. Install the two 6 mm bolts, but do not tighten.



EH42PLE04 CYLINDER HEAD EXPLODED VIEW

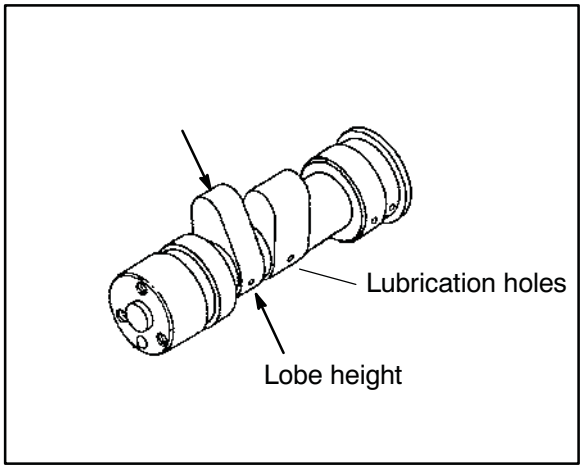


CAMSHAFT INSPECTION

1. Visually inspect each cam lobe for wear, chafing or damage.
2. Thoroughly clean the cam shaft, making sure the oil feed holes are not obstructed.
3. Measure height of each cam lobe using a micrometer. Compare to specifications.

Cam Lobe Height (Intake & Exhaust):

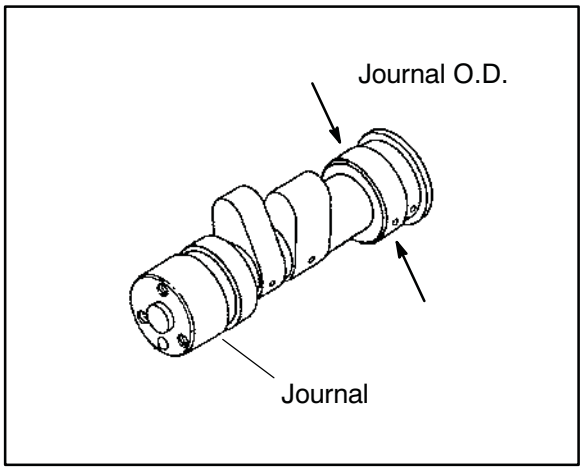
Std: 1.2884-1.2924″ (32.726-32.826 mm)
Limit: 1.2766″ (32.426 mm)



4. Measure camshaft journal outside diameter (O.D.)

Camshaft Journal O.D.:

Mag & PTO End: 1.4935-1.4941″
(37.935-37.950 mm)



5. Measure ID of camshaft journal bore.

Camshaft Journal I.D.:

Mag & PTO End: 1.4963-1.4970″
(38.005-38.025 mm)

6. Calculate oil clearance by subtracting journal OD from journal bore ID. Compare to specifications.

Camshaft Oil Clearance:

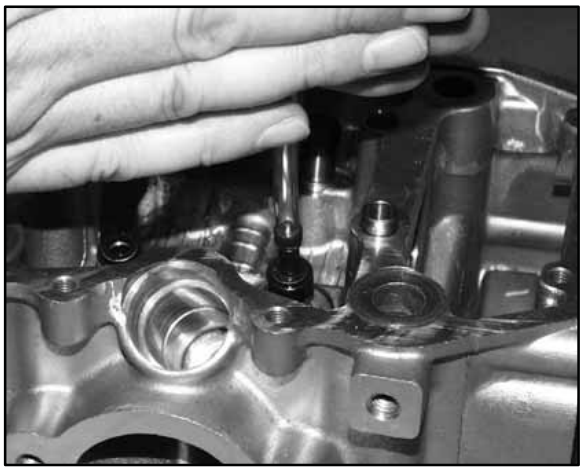
Std: .0022-.0035″ (.055-.090 mm)
Limit: .0039″ (.10 mm)

Replace camshaft if damaged or if any part is worn past the service limit.

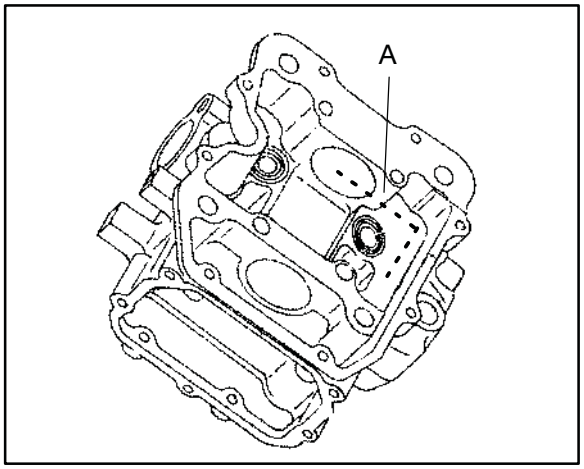
Replace cylinder head if camshaft journal bore is damaged or worn excessively.

VALVE SEAT RECONDITIONING, CONT.

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



12. Clean cylinder head, valves, and camshaft oil supply passage (A) thoroughly.
13. If oil passage blind plug was removed, apply 3 Bond 1215 or equivalent sealer to the threads and install, torquing to 8 ft. lbs. (1.1 kg-m). **CAUTION:** Do not allow sealant to enter oil passage.
14. Spray electrical contact cleaner into oil passage and dry using compressed air.



CYLINDER HEAD ASSEMBLY

CAUTION: Wear eye protection during assembly.

NOTE: Assemble the valves one at a time to maintain proper order.

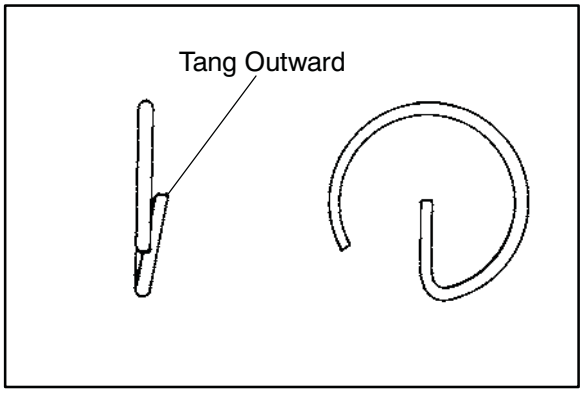
1. Install new valve seals on valve guides.
2. Apply engine oil to valve guides and seats.
3. Coat valve stem with molybdenum disulfide grease.
4. Install valve carefully with a rotating motion to avoid damaging valve seal.

PISTON INSTALLATION

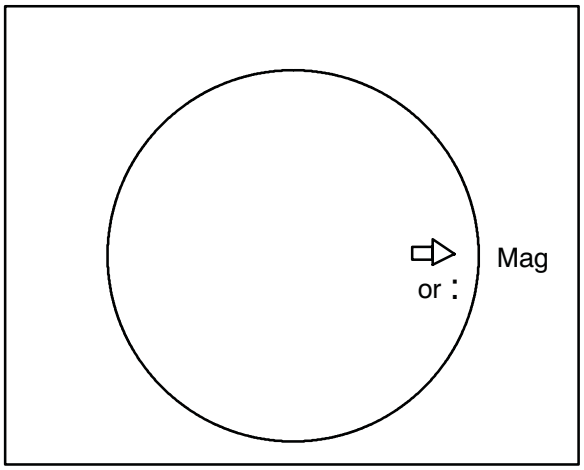
1. Clean the gasket surfaces on the cylinder and crankcase. Remove all traces of old gasket material.
2. Make sure the cylinder mounting bolt holes are clean and free of debris.
3. Install a new circlip on one side of the piston with the end gap facing *up* or *down,* and tang outward.

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

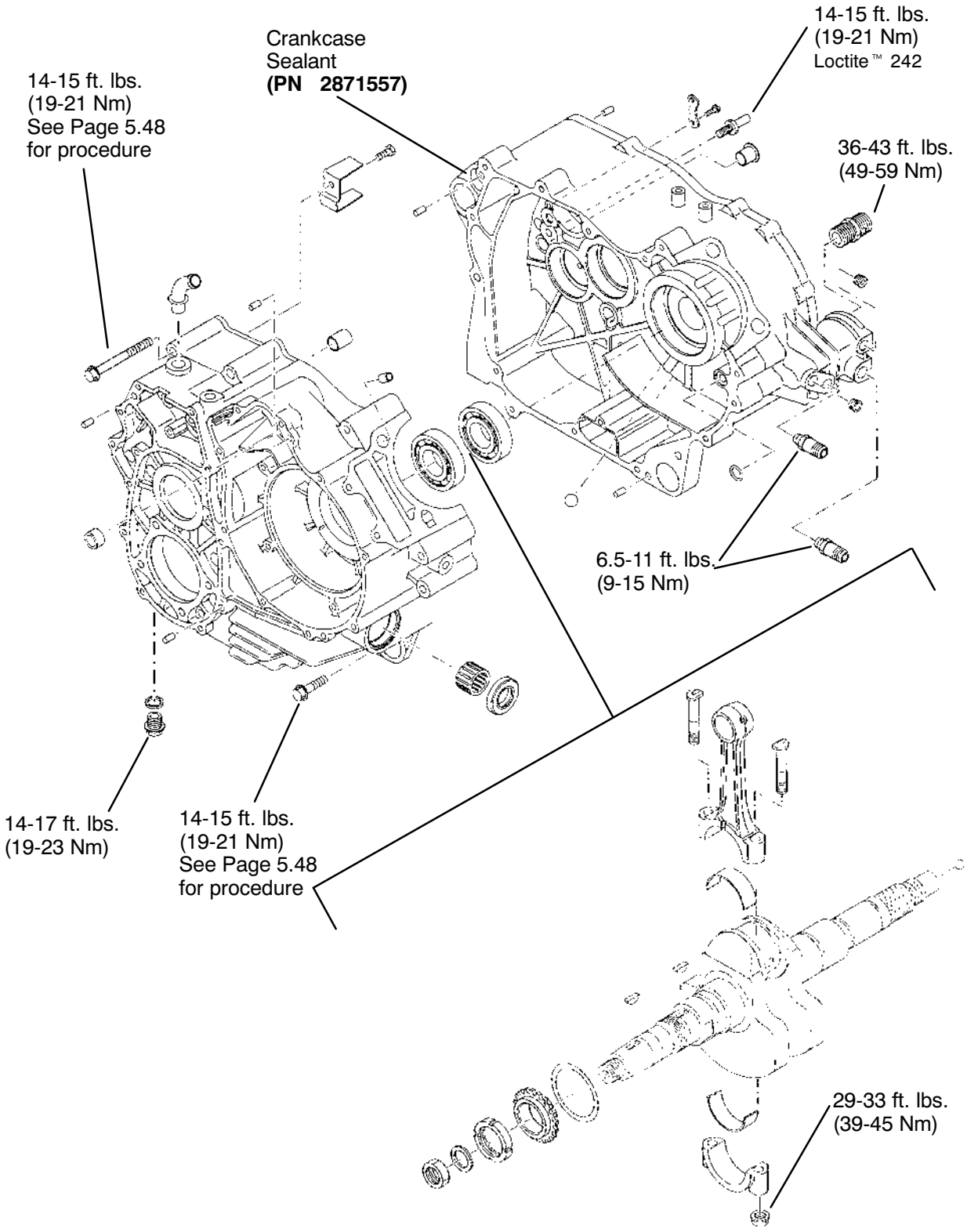
4. Apply clean engine oil to the piston rings, ring lands, piston pin bore, piston pin, and piston skirt. Lubricate the connecting rod (both ends), balancer drive gear, and crankshaft main bearing area.



5. Install the piston on the connecting rod with the arrow or : mark facing the magneto (RH) end of the crankshaft. The piston pin should be a push fit in the piston.
6. Install the other circlip with the gap facing up or down and tang outward. (See Caution with Step 3 above). Push the piston pin in both directions to make sure the clips are properly seated in the groove.

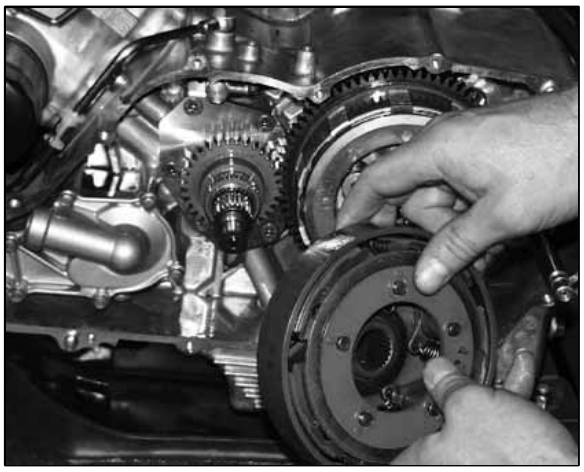


ES32PFE03 CRANKCASE / CRANKSHAFT EXPLODED VIEW

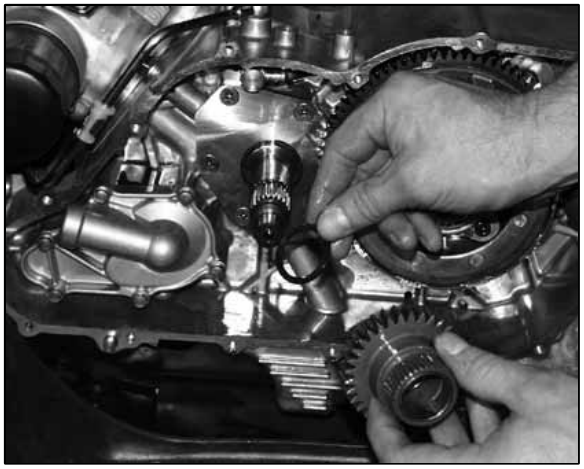


CENTRIFUGAL CLUTCH REMOVAL, CONT.

3. Remove centrifugal clutch weight assembly and clutch drum.



4. Remove the primary drive gear and shim from the crankshaft.

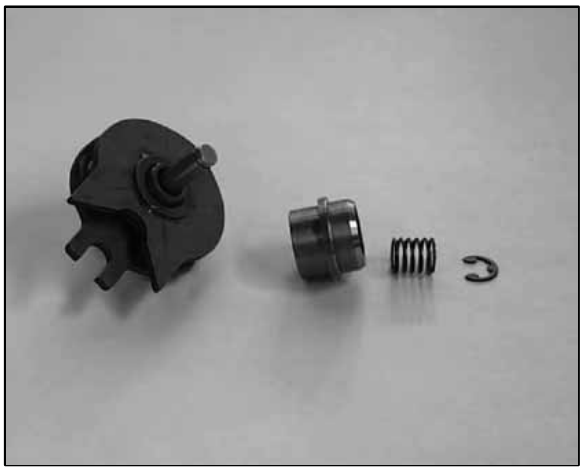


CENTRIFUGAL CLUTCH INSPECTION

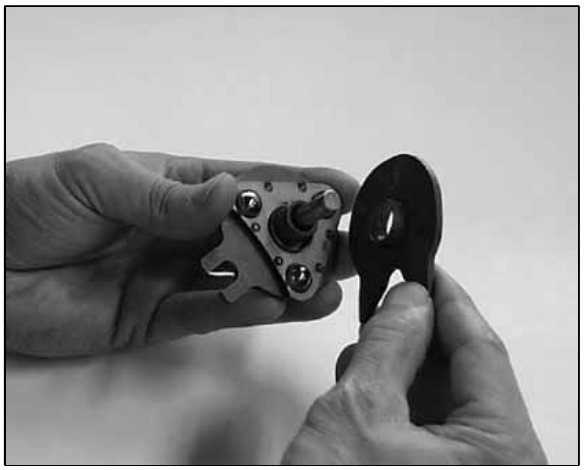
1. Hold the clutch drum and rotate the clutch weight assembly. You should only be able to turn it counterclockwise.
2. Check the rollers for excessive wear.
3. Remove the clutch weight assembly and one-way clutch from the clutch drum.

RELEASE LEVER INSPECTION, CONT.

2. Inspect spring, replace e-clip.



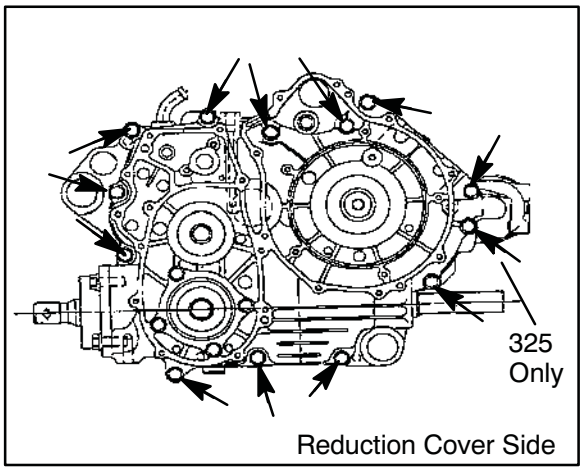
3. Inspect lifter bearing assembly for worn or damaged parts.



4. Inspect lifter ramps and replace if worn.

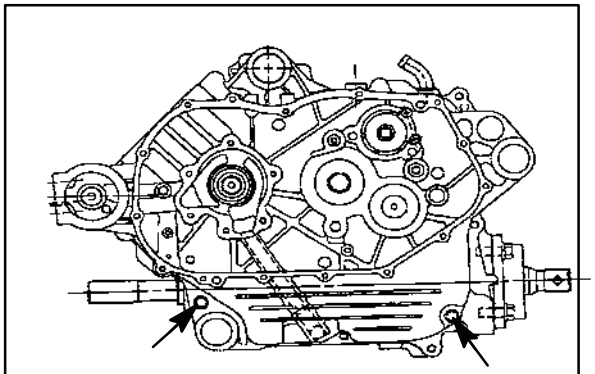
CRANKCASE SEPARATION

1. Remove (13) bolts (Xpedition 325), or (12) bolts (Xpedition 425) from the reduction cover side (RH).

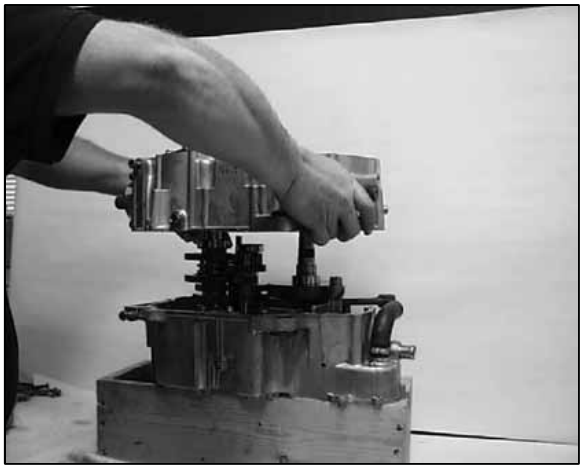


Reduction Cover Side

2. Remove (2) bolts from the clutch cover side (LH).

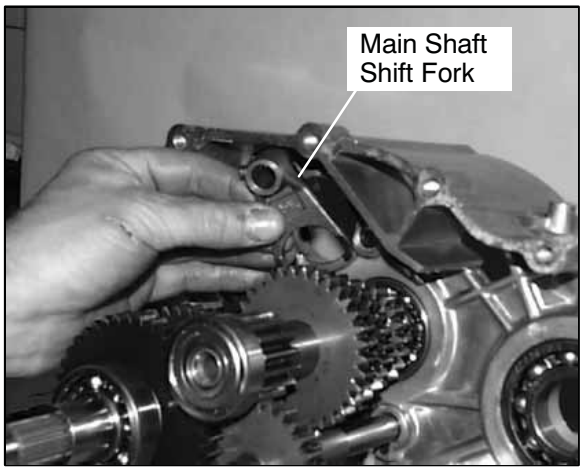

Clutch Cover Side

3. Remove right hand crankcase from left hand.

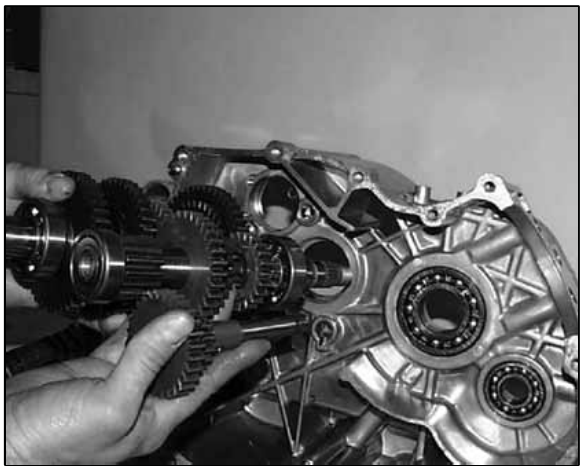


TRANSMISSION REMOVAL / DISASSEMBLY, CONT.

4. Remove (main shaft) shift fork.



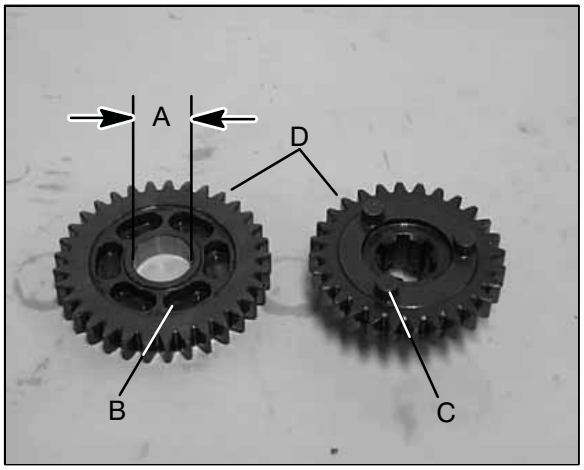
5. Remove shafts as an assembly.



TRANSMISSION INSPECTION

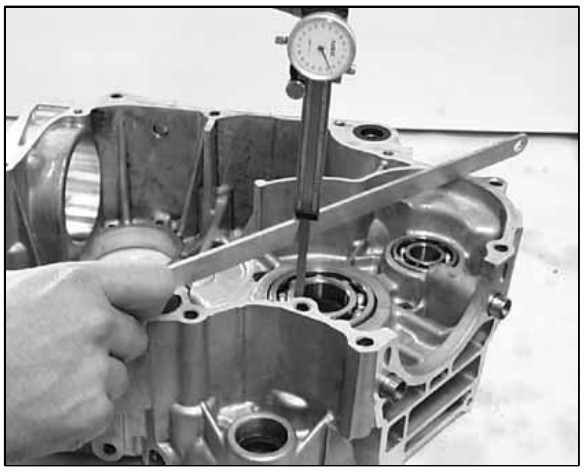
1. Disassemble all gears and keep in order for reassembly. Common inspection points of transmission gears:
   A. Measure inside diameter of gears.
   B. Inspect dog slots for wear (rounding of slot).
   C. Inspect dogs for wear (rounding of dog).
   D. Inspect gear teeth for worn, chipped, cracked, or broken teeth.

2. Inspect all gears and shafts as outlined on the following page. Compare to specifications.

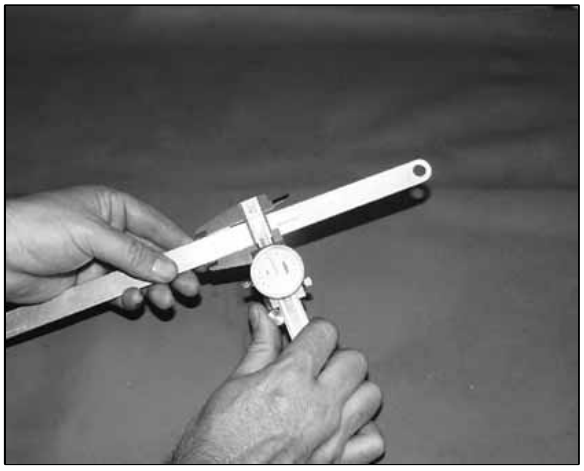


CRANKSHAFT END PLAY ADJUSTMENT, CONT.

4. Measure the distance from the Magneto crankcase mating surface to the main bearing using the same method and record.



5. Subtract the thickness of the straightedge from the measurement obtained in Step 4 and record.

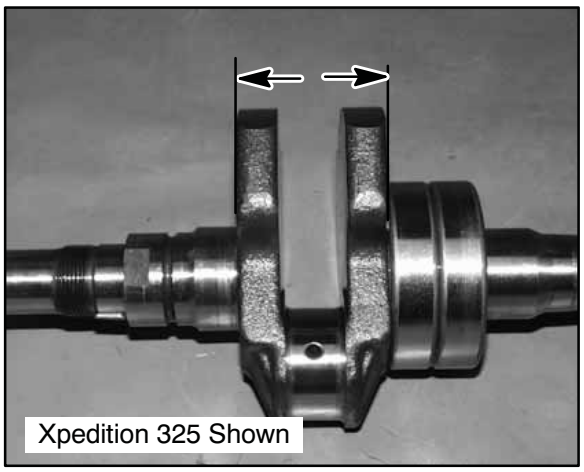


Mag Case Depth _____

6. Add the readings recorded in Step 3 and Step 5 and record below.

Total Case Width _____

7. Measure the width of the crankshaft at the bearing seats with a micrometer or dial caliper and record.



Xpedition 325 Shown

Crankshaft Width _____

8. Subtract the Crankshaft Width measured in Step 7 from the Total Case Width recorded in Step 6, and record below.

Total End Play _____

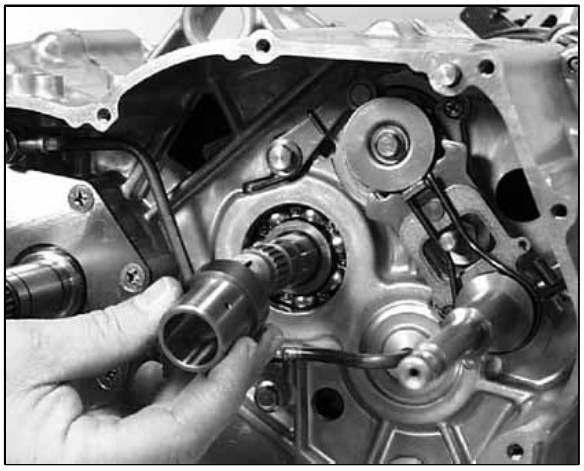
9. Subtract the thickness of the existing shim from the result of Step 8 to determine if a different shim is required. The result must be within the specified range listed.

Crankshaft End Play:

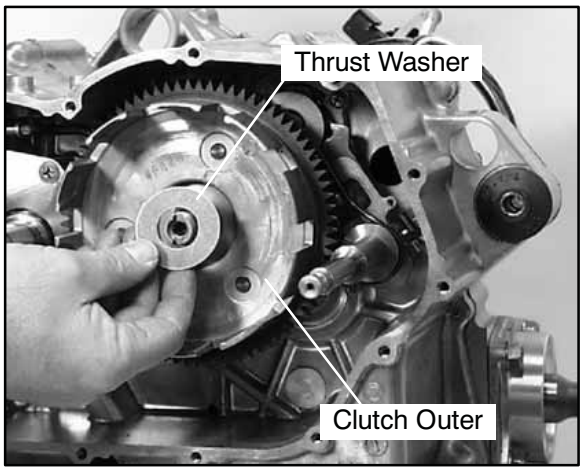
.0020″-.0079″ (.05-.20 mm)

CHANGE CLUTCH INSTALLATION

1. Apply molybdenum disulfide grease to the inner and outer surfaces of the clutch outer guide. Install the clutch outer guide on the main shaft.

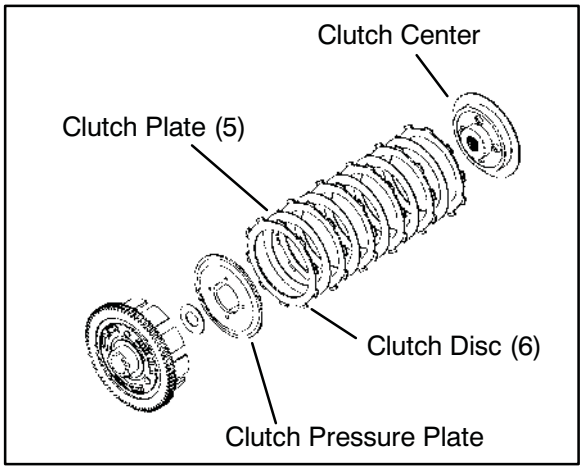


2. Install the clutch outer and thrust washer.



3. Assemble the clutch pressure plate, discs, plates and clutch center, and install them in the clutch outer.

NOTE: •Stack the discs and plates alternately.
•Coat new clutch discs with engine oil.
•Be sure the clutch center and pressure plate grooves are properly aligned.



CHAPTER 6
FUEL SYSTEM/CARBURETION

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Main Jet Selection 6.1
Special Tools 6.2
Fuel Tank Assy. Exploded View 6.2
Fuel Flow Diagram 6.3
Main Jet / Pilot Jet Part Numbers 6.3
CV Carburetor System Components 6.4
CV Carburetor Operation 6.5-6.7
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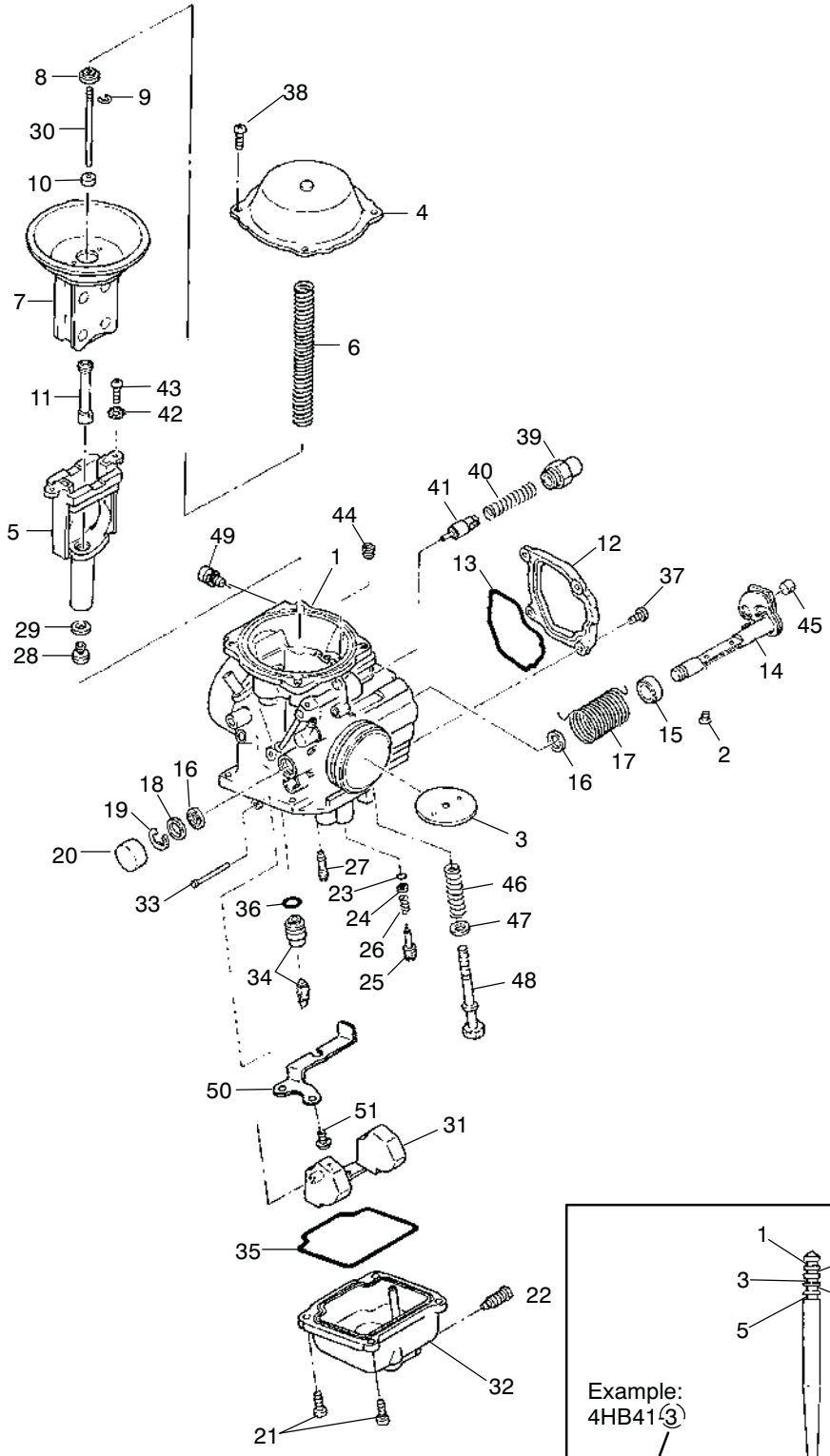
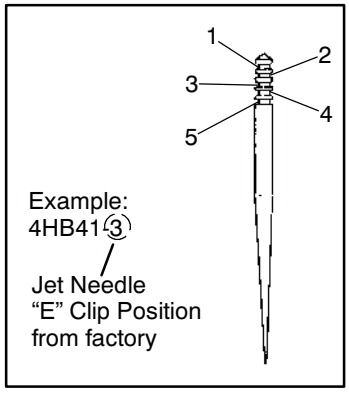
BST 34 CARBURETOR EXPLODED VIEW



Refer to Page 6.3 for Jet Part Numbers



1. Carburetor Assembly
2. Screw
3. Throttle Valve
4. Cover, Diaphragm
5. Jet Block Assembly
6. Spring
7. Diaphragm Assembly
8. Ring
9. "E" Ring
10. Ring
11. Needle Jet
12. Cover
13. O-Ring
14. Throttle Shaft Assembly
15. Ring
16. Seal
17. Spring
18. Packing
19. "E" Ring
20. Cap
21. Screw
22. Drain Screw
23. O-Ring
24. Washer
25. Adjuster
26. Spring
27. Pilot Jet
28. Main Jet
29. Washer
30. Jet Needle
31. Float Assembly
32. Float Body Assembly
33. Float Pin
34. Needle Valve
35. O-Ring
36. O-Ring
37. Screw
38. Screw
39. Guide Holder
40. Spring
41. Plunger Assembly
42. Spring Washer
43. Screw
44. Air Jet
45. Cable Guide
46. Spring
47. Ring
48. Adjust Screw
49. Screw and Washer Assy.
50 Plate
51 Screw

TROUBLESHOOTING

POOR IDLE

Symptoms: Idle too high.

- Idle adjusted improperly/idle mixture screw damaged
- Sticky vacuum slide
- Throttle cable sticking, improperly adjusted, routed incorrectly
- Choke cable sticking, improperly adjusted, routed incorrectly

IDLE TOO LOW

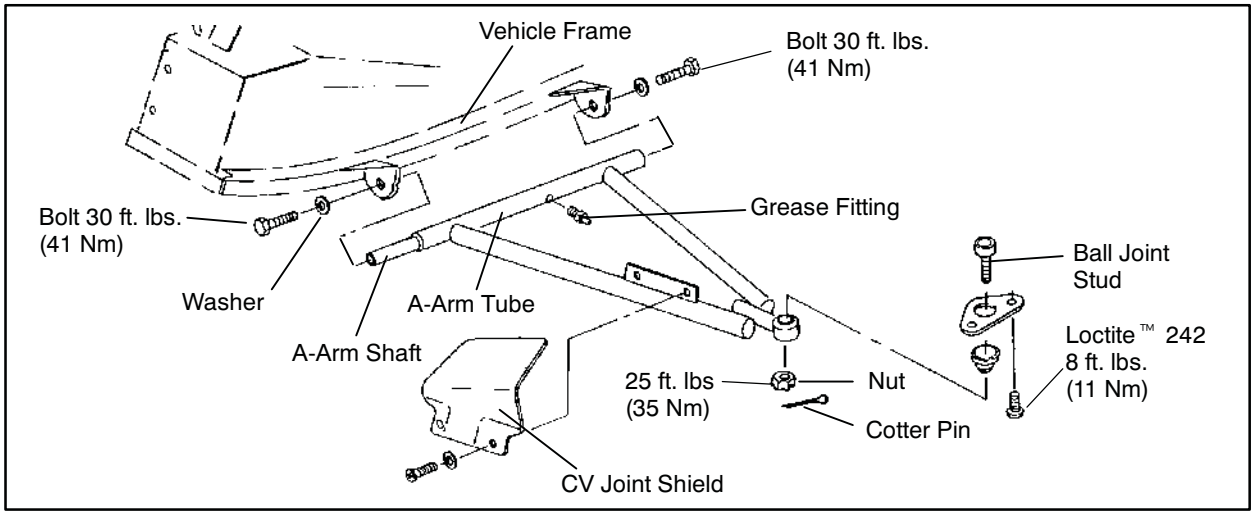
- Choke cable bending or incorrectly adjusted
- Idle speed set incorrectly
- Idle mixture screw misadjusted or damaged
- Belt dragging
- Ignition timing incorrect
- Worn jet needle/needle jet

ERRATIC IDLE

- Choke cable bending or incorrectly adjusted
- Throttle cable incorrectly adjusted
- Air leaks, dirty carburetor passages (pilot circuit)
- Pilot mixture screw damaged or adjusted incorrectly
- Tight valves
- Ignition timing incorrect
- Belt dragging
- Dirty air cleaner
- Engine worn
- Spark plug fouled
- Idle speed set incorrectly (speed limiter)
- Worn jet needle/needle jet

A-ARM REPLACEMENT

1. Elevate and safely support vehicle with weight removed from front wheel(s).
2. Remove cotter pin from ball joint stud at wheel end of A-arm and loosen nut until it is flush with end of stud.
3. Using a soft face hammer, tap nut to loosen A-arm from bolt. Remove nut and A-arm from hub strut assembly.
4. Loosen two bolts on A-arm tube by alternating each about 1/3 of the way until A-arm can be removed.
5. Examine A-arm shaft. Replace if worn. Discard hardware.
6. Insert A-arm shaft into new A-arm.
7. Install CV joint shields.



8. Install new A-arm assembly onto vehicle frame. Torque new bolts to 30 ft. lbs. (41.4 Nm).

⚠ WARNING

The locking features on the existing bolts were destroyed during removal. **DO NOT** reuse old bolts. Serious injury or death could result if fasteners come loose during operation.

9. Attach A-arm to hub strut assembly. Tighten ball joint nut to 25 ft. lbs. (35 Nm). If cotter pin holes are not aligned, tighten nut slightly to align. Install a new cotter pin with open ends toward rear of machine. Bend both ends in opposite directions around nut.
10. Locate grease fitting in center of A-arm tube and pump A-arm full of grease.

A-arm Attaching Bolt Torque:

30 ft. lbs. (41 Nm)

Ball Joint Stud Nut Torque:

25 ft. lbs. (35 Nm)

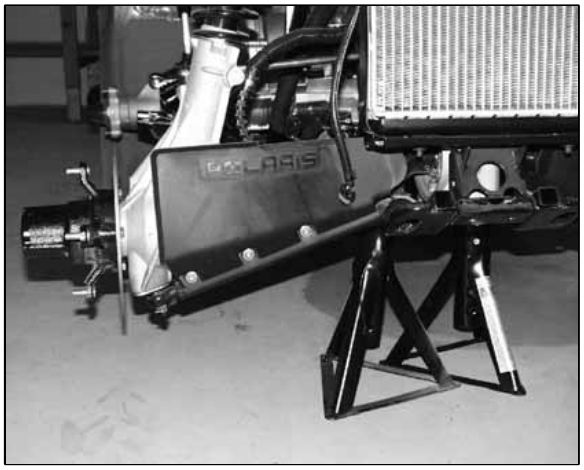
⚠ WARNING

Upon A-arm installation completion, test vehicle at low speeds before putting into regular service.

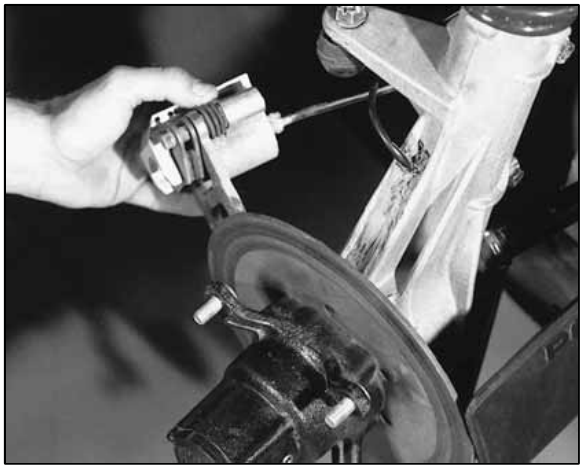
FRONT HUB REMOVAL

If an AWD problem is encountered, thoroughly inspect the electrical portion of the system as well as the front hub mechanism. Refer to the electrical chapter.

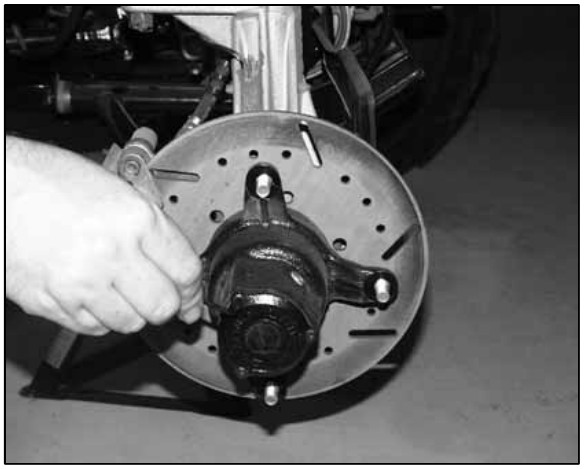
1. Carefully lift and support the front end of the machine as shown with the jack stands under the front end of the foot rests. **CAUTION:** Make sure the machine is solidly supported before proceeding. Serious injury could occur if the machine tips or falls.
2. Remove the front wheels and thoroughly clean the area around the hub, strut casting, brake caliper and brake disc.



3. Remove the two brake caliper attaching bolts. **CAUTION:** Do not hang the caliper by the brake hose. Use wire to hang the caliper to prevent possible damage to the brake line.



4. Place a catch pan beneath the front hub and remove the hub cap.
5. Remove cotter pin and nut.
6. Remove front hub and bearings.



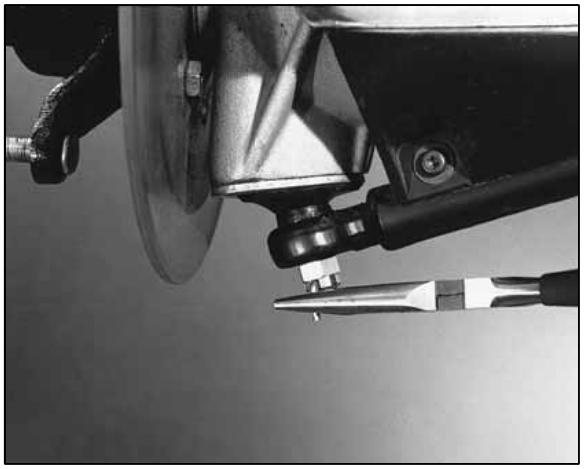
DRIVESHAFT AND CV JOINT HANDLING TIPS

Care should be exercised during driveshaft removal or when servicing CV joints. Driveshaft components are precision parts.
Cleanliness and following these instructions is very important to ensure proper shaft function and a normal service life.

- The complete driveshaft and joint should be handled by getting hold of the interconnecting shaft to avoid disassembly or potential damage to the driveshaft joints.
- Over-angling of joints beyond their capacity could result in boot or joint damage.
- Make sure surface-ground areas and splines of shaft are protected during handling to avoid damage.
- Do not allow boots to come into contact with sharp edges or hot engine and exhaust components.
- The driveshaft is not to be used as a lever arm to position other suspension components.
- Never use a hammer or sharp tools to remove or to install boot clamps.
- Be sure joints are thoroughly clean and that the proper amount and type of grease is used to refill when joint boots are replaced and when joints are cleaned. Refer to text for grease capacity of CV joints and CV joint boots.

FRONT DRIVE SHAFT CV JOINT BOOT REPLACEMENT

1. Remove wheel, brake caliper and wheel hub. Refer to front hub disassembly Page 8.3 for procedure.
2. Remove cotter pin and castle nut from A-arm ball joint.

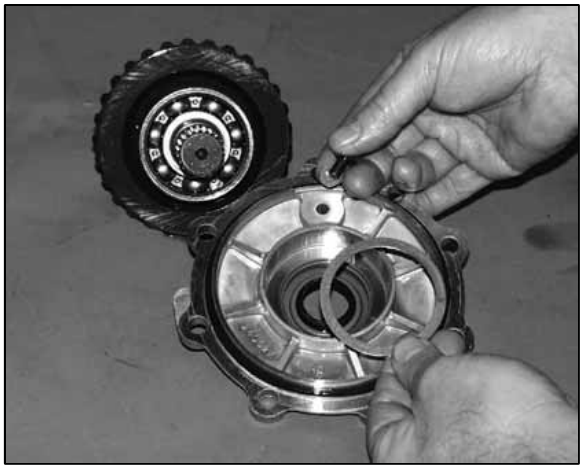


3. Disconnect A-arm from ball joint using a tie rod fork.
4. Slide strut off end of drive shaft and tie it up out of the way of the shaft.

NOTE: Be careful not to damage the wheel coil wires when positioning the strut.

FRONT GEARCASE DISASSEMBLY, CONT.

3. Remove output shaft assembly, large shim, and thrust button with its small shim.
4. Clean all parts and inspect spacers for wear. Inspect ring gear for chipped, broken, or missing teeth.



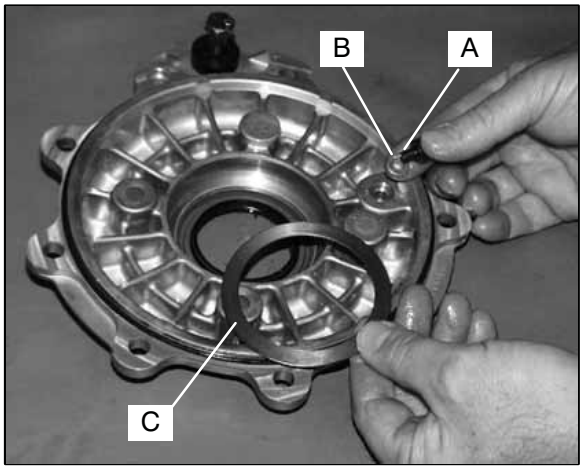
5. Remove pinion cover and O-ring.

6. Unscrew fill plug and remove pinion shaft assembly. Inspect pinion gear for chipped broken or missing teeth.

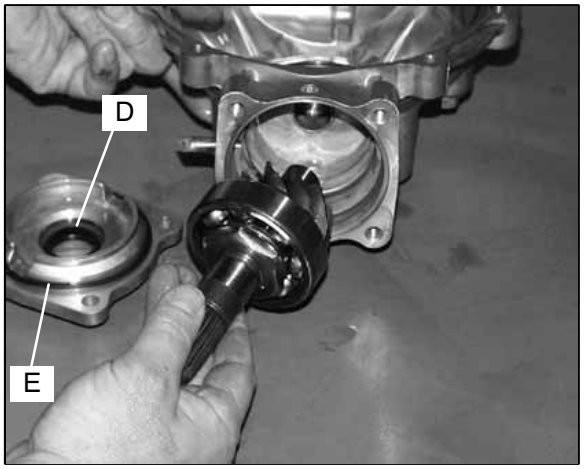
NOTE: Pinion shaft assembly will not clear the fill plug unless it is backed out.

REAR GEARCASE DISASSEMBLY, CONT.

3. Remove output shaft assembly from the cover.
4. Remove thrust button (A) and shim (B) from output cover. Inspect for wear and replace if worn.
5. Remove output shaft bearing shim (C) from the cover and retain for re-assembly.



6. Remove and discard the output shaft cover seal (D) and O-ring.
7. Remove pinion cover and O-ring (E).
8. Remove pinion shaft assembly. Inspect pinion gear for chipped, broken or missing teeth. Replace assembly if necessary.



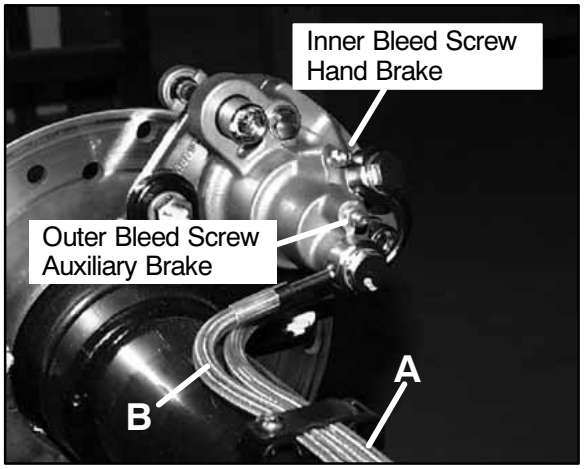
HYDRAULIC CALIPER BLEEDING

This caliper is a dual opposed piston design, with two independent hydraulic systems contained in the same caliper body (see illustration below). The caliper pistons are T-shaped, which allows both hand and foot brake to use the same caliper piston, but remain separated by seals. The hand brake system applies hydraulic pressure to both front calipers and only the *outer* diameter of the rear caliper pistons. The auxiliary (foot) brake applies pressure to the inner portion of the rear caliper pistons. Because the hand and foot brake hydraulic systems are separate, there are also two bleed screws – one for the outer fluid chamber (hand brake), and one for the inner fluid chamber (foot brake). The basic procedure for bleeding the brake system is the same as outlined on Page 9.5 - 9.7; however, each system must be bled separately.

Hydraulic Auxiliary Brake inspection and adjustment is outlined on Page 2.35.

Uppermost (inner) bleed screw and brake line (A) is for hand brake system.

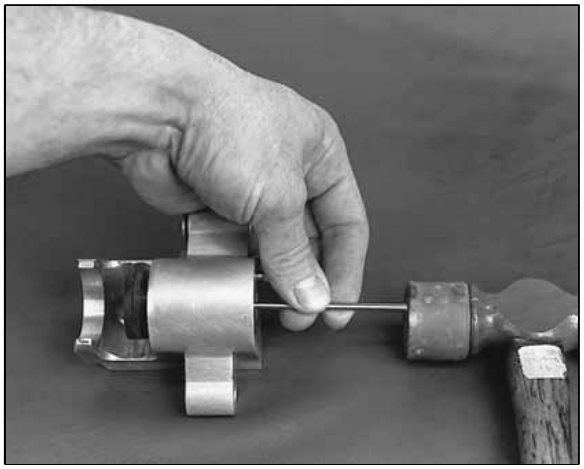
Lower (outer) bleed screw and brake line (B) is for auxiliary (foot) brake system.



FRONT CALIPER DISASSEMBLY, CONT.

4. Remove piston, dust seal and piston seal.
5. Clean the caliper body, piston, and retaining bracket with brake cleaner or alcohol.

NOTE: Be sure to clean seal grooves in caliper body.

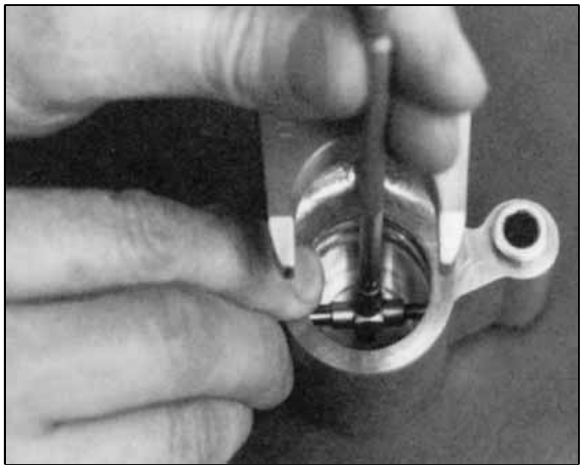


FRONT CALIPER INSPECTION

1. Inspect caliper body for nicks, scratches or wear. Measure bore size and compare to specifications. Replace if damage is evident or if worn beyond service limit.

Front Caliper Piston Bore I.D.

Std. 1.191-1.192″ (30.25-30.28 mm)
Service Limit 1.193″ (30.30 mm)



2. Inspect piston for nicks, scratches, wear or damage. Measure diameter and replace if damaged or worn beyond service limit.

Front Caliper Piston O.D.

Std. 1.186-1.1875″ (30.13-30.16 mm)
Service Limit 1.1855″ (30.11 mm)

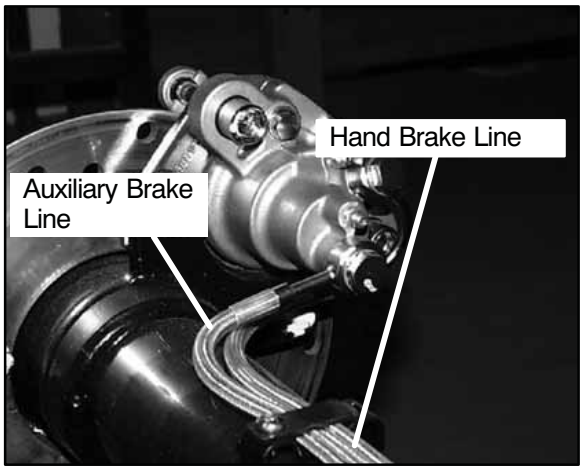
3. Inspect the brake disc and pads as outlined for brake pad replacement this section. See Page 9.12.

REAR CALIPER ASSEMBLY, CONT.

5. Install brake lines and tighten to specified torque.

Banjo Bolt Torque

15 ft. lbs. (21 Nm)



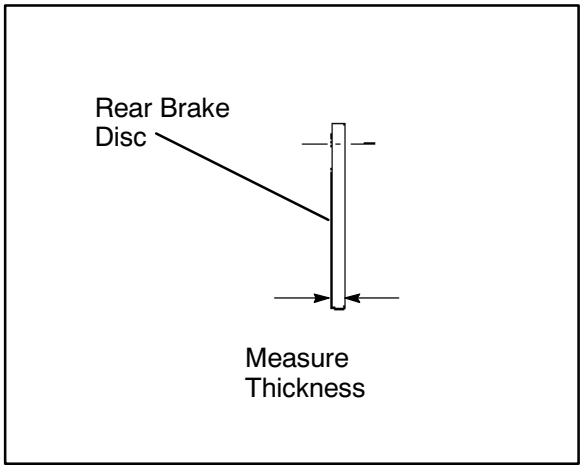
6. Follow bleeding procedure outlined on Pages 9.5-9.6 of this section and refer to system overview and illustration on Page 9.4.

7. Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, re-check assembly and installation.

REAR BRAKE DISC INSPECTION

1. Visually inspect disc for scoring, scratches, or gouges. Replace the disc if any deep scratches are evident.

2. Use a 0-1″ micrometer and measure disc thickness at 8 different points around perimeter of disc. Replace disc if worn beyond service limit.



Brake Disc Thickness
New .177-.187″ (4.496-4.750 mm)
Service Limit .167″ (4.242 mm)

Brake Disc Thickness Variance
Service Limit .002″ (.051 mm) difference between measurements

3. Mount dial indicator and measure disc runout. Replace the disc if runout exceeds specifications.

Brake Disc Runout
Service Limit .005″ (.127 mm)

AWD / REVERSE ACTUATOR WIRING DIAGRAM - XPEDITION 325

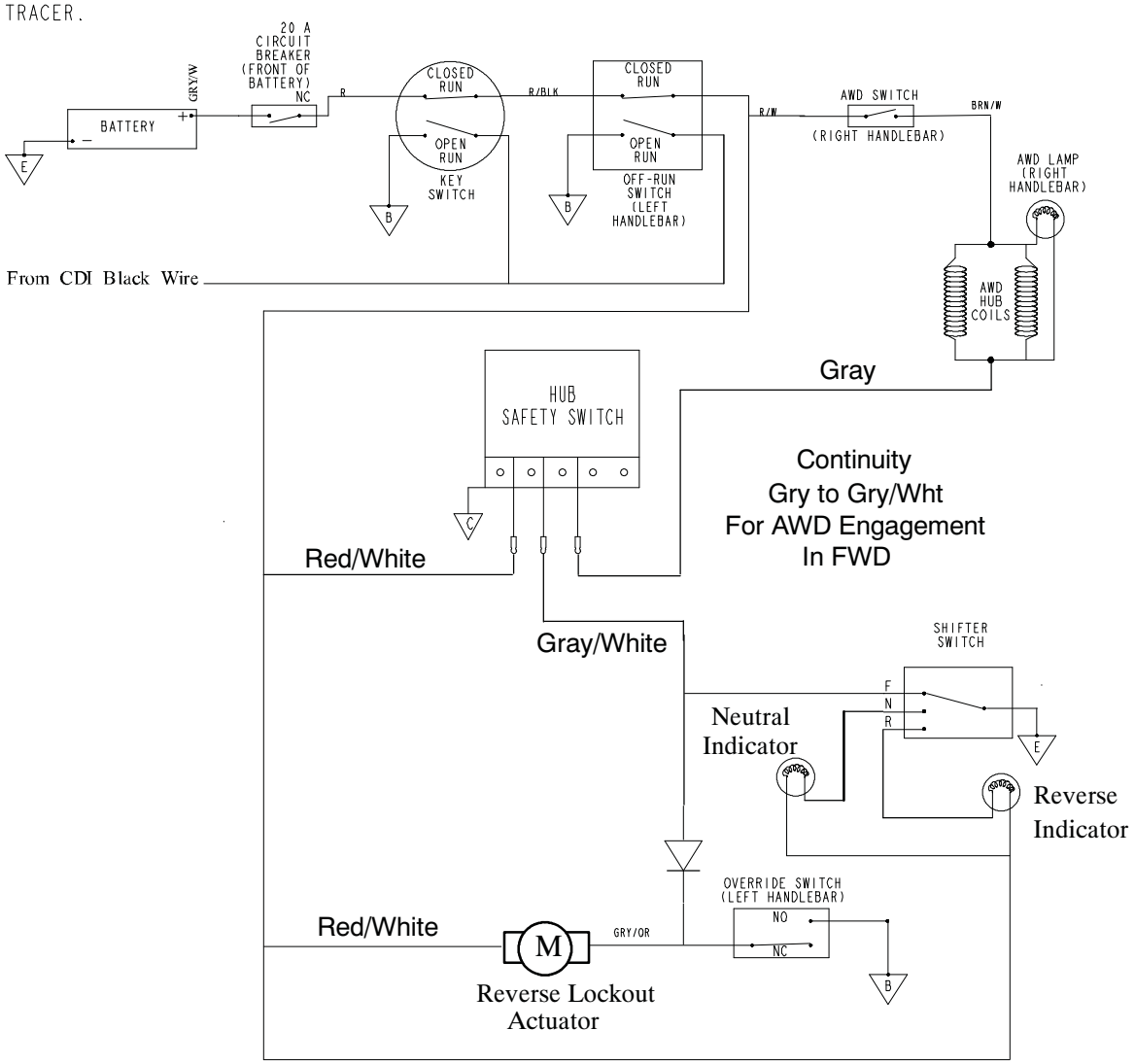
COLOR CODE

BLK = BLACK
BRN = BROWN
GRN = GREEN
PUR = PURPLE
BLU = BLUE
GRY = GRAY
OR = ORANGE
Y = YELLOW
R = RED
W = WHITE

TWO COLOR WIRES ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE: R/Y = RED WITH YELLOW TRACER.

E = ENGINE GROUND
B = BROWN WIRE GROUND

NC = SWITCH NORMALLY CLOSED
NO = SWITCH NORMALLY OPEN



ELECTRONIC THROTTLE CONTROL (ETC) SWITCH

The Electronic Throttle Control (ETC) system is designed to stop the engine of an ATV in the event of a mechanical problem with the throttle mechanism. The ETC switch is mounted independently of the throttle actuator lever inside the throttle block assembly. This is a normally closed switch, and is held in the open position (contacts are separated as shown in Ill. 1) by throttle cable tension. The contacts are “open” in normal operation regardless of throttle lever position. In the event of a mechanical problem in the throttle mechanism (cable tension is lost), the switch contacts close, connecting the CDI black wire to ground, preventing ignition spark. This is the same as turning the key or engine stop switch “OFF”.

Test the ETC switch at the harness connector. **NOTE:** Adjust throttle cable freeplay (ETC switch) and make sure throttle mechanism is functioning properly before testing the switch. Refer to Maintenance Chapter 2 for cable adjustment procedure.

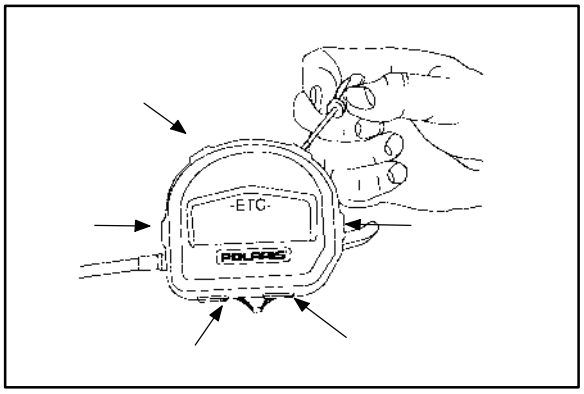
ETC OPERATION TEST

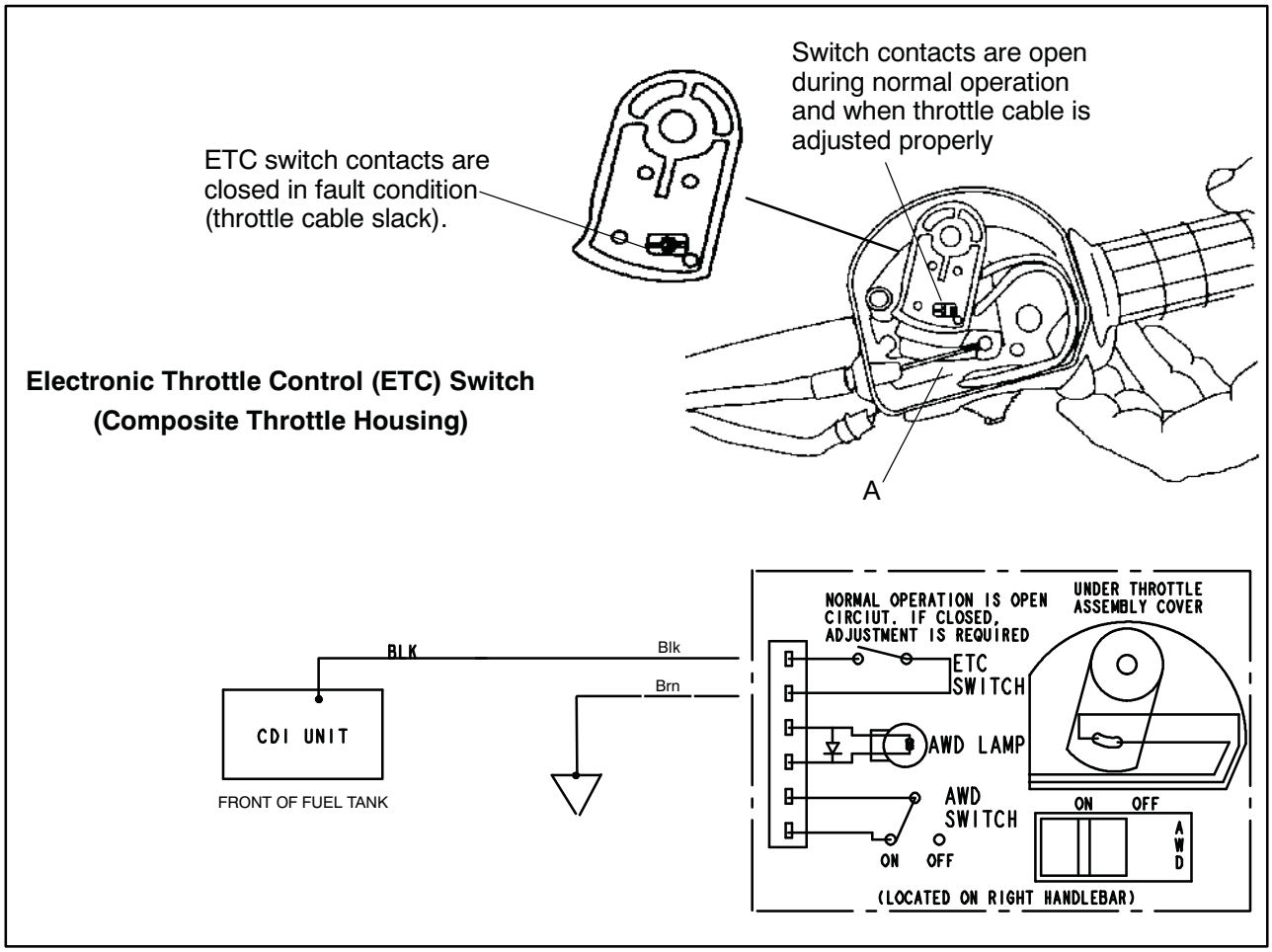
Remove throttle block cover by carefully releasing all tabs around edge of cover.

Place transmission in neutral and apply parking brake.

Start engine and open throttle lever slightly until engine RPM is just above idle speed.

Hold throttle cable with fingers at point “A” as shown below and release throttle lever. If the ETC system is functioning properly, the engine will lose spark and stop.



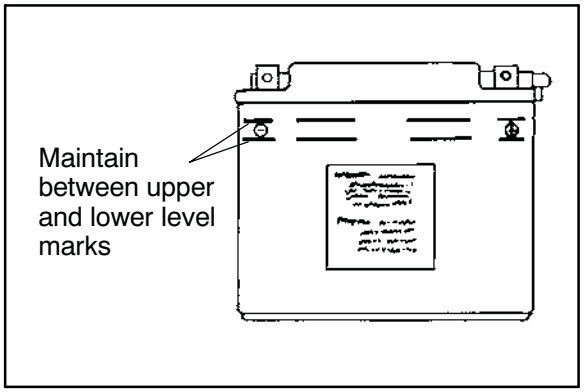


Electronic Throttle Control (ETC) Switch (Composite Throttle Housing)

BATTERY INSPECTION/REMOVAL

The battery is located under the left rear fender.

Inspect the battery fluid level. When the battery fluid nears the lower level, the battery should be removed and distilled water should be added to the upper level line. To remove the battery:



1. Disconnect holder strap and remove cover.
2. Disconnect battery negative (-) (black) cable first, followed by the positive (+) (red) cable.

⚠ CAUTION

Whenever removing or reinstalling the battery, disconnect the negative (black) cable first and reinstall the negative cable last!

3. Disconnect the vent hose.
4. Remove the battery.
5. Remove the filler caps and add *distilled water only* as needed to bring each cell to the proper level. Do not overfill the battery.

⚠ To refill use only distilled water. Tap water contains minerals which are harmful to a battery.

⚠ Do not allow cleaning solution or tap water to enter the battery. It will shorten the life of the battery.

6. Reinstall the battery caps.

BATTERY INSTALLATION

1. Clean battery cables and terminals with a stiff wire brush. Corrosion can be removed using a solution of one cup water and one tablespoon baking soda. Rinse will with clean water and dry thoroughly.
2. Reinstall battery, attaching positive (+) (red) cable first and then the negative (-) (black) cable. Coat terminals and bolt threads with Nyogel™ grease **(PN 2871329)**.
3. Install clear battery vent tube from vehicle to battery vent. **WARNING:** Vent tube must be free from obstructions and kinks and securely installed. If not, battery gases could accumulate and cause an explosion. Vent should be routed away from frame and body to prevent contact with electrolyte. Avoid skin contact with battery electrolyte, severe burns could result. If electrolyte contacts the vehicle frame, corrosion will occur.
4. Route cables so they are tucked away in front and behind battery.
5. Reinstall battery cover and holder strap.

⚠ Do not start the engine with the battery disconnected. Vehicle lamps will burn out if battery is disconnected during vehicle operation. Also, the reverse speed limiter can be damaged.

BATTERY TESTING

Whenever a service complaint is related to either the starting or charging systems, the battery should be checked first.

Following are three tests which can easily be made on a battery to determine its condition: OCV Test, Specific Gravity Test and Load Test.

OCV - OPEN CIRCUIT VOLTAGE TEST

Battery voltage should be checked with a digital multitester. Readings of 12.6 or less require further battery testing and charging. See charts and Load Test on Page 10.26.

NOTE: Lead-acid batteries should be kept at or near a full charge as possible. Electrolyte level should be kept between the low and full marks. If the battery is stored or used in a partially charged condition, or with low electrolyte levels, hard crystal sulfation will form on the plates, reducing the efficiency and service life of the battery.