TRAILFIRE

TECHNICAL MANUAL
TM-1197 (NOV-81)

CONTENTS

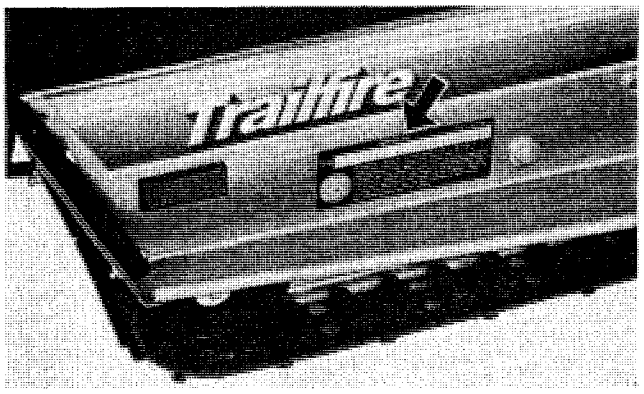
Section 10
GENERAL SNOWMOBILE IDENTIFICATION

CONTENTS

1197/1000A/050681

SNOWMOBILE SERIAL NUMBER

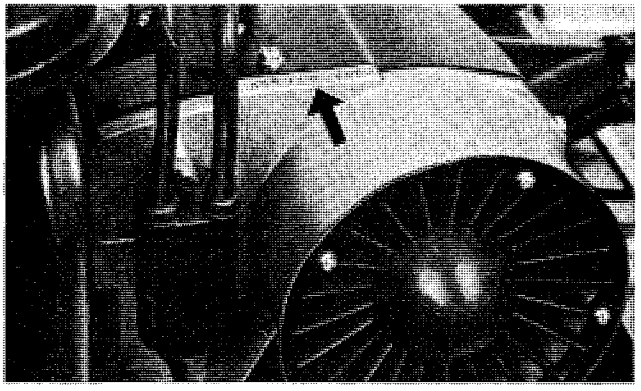
The snowmobile serial number is stamped into the right-hand side of the tunnel.



M23295/1197/1005A/050681

ENGINE SERIAL NUMBER

The engine serial number is stamped into the top of the fan housing.



M23296/1197/1005B/050681

VINTAGE INFORMATION

1979 Model Year

Snowmobile	340 Trailfire	440 Trailfire
Serial Number	J34FH 095001M	J44FH 095001M
Code No. (type)	J34FH	J44FH
Engine Manufacturer	JOHN DEERE FIREBURST™*	JOHN DEERE FIREBURST™*
Engine Model No.	TA340A Piston-Ported	TA440A Piston-Ported

1980 Model Year

Snowmobile	340 Trailfire	440 Trailfire
Serial Number	J34FJ120001M	J44FJ120001M
Code No. (type)	J34FJ	J44FJ
Engine Manufacturer	JOHN DEERE FIREBURST™*	JOHN DEERE FIREBURST™*
Engine Model No.	TA340A Piston-Ported	TA440A Piston-Ported

1981 Model Year

Snowmobile	340 Trailfire	440 Trailfire
Serial Number	J34FK155001M	J44FK155001M
Code No. (type)	J34FK	J44FK
Engine Manufacturer	JOHN DEERE FIREBURST™*	JOHN DEERE FIREBURST™*
Engine Model No.	TA340A Piston-Ported	TA440A Piston-Ported

1982 Model Year

Snowmobile	340 Trailfire	Trailfire LX
Serial Number	J34FL190001M	J44FL190001M
Code No. (type)	J34FL	J44FL
Engine Manufacturer	JOHN DEERE FIREBURST™*	JOHN DEERE FIREBURST™*
Engine Model No.	TA340A Piston-Ported	TA440A Piston-Ported

**Manufactured for John Deere by Kawaski Heavy Industries, Japan.*

1197/1005C/060581

SNOWMOBILE SPECIFICATIONS

FUEL SYSTEM
- Capacity (U.S. Gallons) . . . . . .(28.4 L) 7.5 gals.
- Mixing Ratio. 50:1*
- Filters . . . . . Two located in pick-up line
- Fuel Pump:
  - Mikuni . . . . . Impulse-type located in the inlet line
- Carburetor . . . . . .Mikuni
- Oil Pump (Trailfire LX)
  - Mikuni . . . . . Reciprocating-plunger driven by the engine
- Oil Tank Capacity (Trailfire LX). . . . . .(1.7 L) 3-1/2 pints

ELECTRICAL SYSTEM
- Charge System . . . . . Flywheel Alternator
- Capacity . . . . . .120 Watts
- Ignition System . . . . . Capacitor Discharge
- Ignition Timing . . . . . Align mark on stator with mark on crankcase
- Plug Gap. . . . . .(0.635 mm) 0.025 in.
- Electric Start (Optional) . . . . . 12-Volt DC

SUSPENSION
- Suspension . . . . . Slide Rail
- Drive Sprockets . . . . . .Compression-Molded Polyethelene
- Track Material . . . . . Rubber
- Track Width. . . . . (381 mm) 15 in.
- Track Drive . . . . . .Involute

CHASSIS AND BODY
- Tunnel. . . . . .Aluminum or HSLA Steel
- Pan. . . . . Thermoplastic Tubber
- Hood. . . . . Sheet-Molded Compound
- Windshield. . . . . .Polycarbonate
- Overall Length . . . . . .(259.1 cm) 102 in.
- Overall Width. . . . . (93.9 cm) 37 in.
- Overall Height . . . . . (93.9 cm) 37 in.
- Weight (Approx.) . . . . . (167.8 kg) 370 lbs.

**Trailfire LX - Use in first tank of fuel and operation below (−29°C) −20°F. Use straight gasoline in fuel tank at all other times. Keep oil tank full.*

POWER TRAIN
- Drive Sheave:
  - 340 Trailfire (Serial No. 95,001-120,000) . John Deere (Comet) 94C**
  - 340 Trailfire (Serial No. 120,001-) .John Deere (Comet) 102C
  - 440 Trailfire . . . . . .John Deere (Comet) 102C
- Secondary Sheave. . . . . .John Deere
- Final Drive. . . . . .Enclosed Chain
- Standard Ratio:
  - 340 Trailfire (Serial No. 95,001-120,000) 1.86:1
  - 340 Trailfire (Serial No. 120,001-) 2.06:1
  - 440 Trailfire (Serial No. 95,001-120,000) 1.56:1
  - 440 Trailfire (Serial No. 120,001-) 1.86:1
  - Trailfire LX (Serial No. 190,001-) 1.86:1
- Brake . . . . . Mechanical Disk
- Stop Light . . . . . .Standard

***IMPORTANT: Some 340 Trailfire Snowmobiles (Serial No. 95,001-120,000) have been changed to either a 94C clutch with a silver cover or a 102C clutch under Modification Program M906. The factory installed clutch was a 94C with black cover.*

1197/1010A/060581

ENGINE SPECIFICATIONS

Item	340 Trailfire	440 Trailfire, Trailfire LX
Engine Model	TA340A Piston-Ported	TA440A Piston-Ported
Engine Manufacturer	John Deere Fireburst™*	John Deere Fireburst™*
Type of Engine	Two-Stroke, Air-Cooled	Two-Stroke, Air-Cooled
Number of Cylinders	Two	Two
Cylinder Sleeve	Chrome	Chrome
Bore (mm)	60	68
Stroke (mm)	60	60
Displacement (cc)	339	436
Compression Ratio	6.9:1	6.5:1
Ignition Type	Capacitor Discharge	Capacitor Discharge
Ignition Manufacturer	Kokusan	Kokusan
Lighting Coil Output	120-Watt	120-Watt
Carburetor Manufacturer	Mikuni	Mikuni
Carburetor Model	VM-34/192	VM-34/193
Starting System	Recoil Start (12-Volt Electric Optional)	Recoil Start (12-Volt Electric Optional)

**Manufactured for John Deere by Kawasaki Heavy Industries, Japan.*

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TUNE-UP GUIDE

Operation	Specification	Reference
Replace Spark Plugs	Test for spark Champion QN-3 DO NOT regap - replace	Section 40
Time ignition system	Align mark on stator with mark on flywheel	Section 40
Adjust carburetor	Select main jet Adjust choke plunger Adjust throttle slide Adjust float height Adjust idle screw Adjust air jet	Section 30
Recondition Carburetor	Clean carburetor and install carburetor kit	Section 30

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ADJUSTMENTS

Adjustment	Specification	Reference
Brake	.....	Section 50
Sheave Alignment	.....	Section 50
Track	.....	Section 60
Skis	.....	Section 60

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SPARK PLUG

The only spark plug recommended for the Trailfire Snowmobile engine is a Champion QN-3 (AM53941). Spark plug gap is (0.635 mm) 0.025 in.

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BREAK-IN PERIOD

1. Do not exceed (64.4 kms/hr) 40 mph for the first (40.2 kms) 25 miles.

2. Do not force the machine at full throttle in deep snow.

3. An occasional short burst of power on hard-packed snow is not harmful.

4. Use fuel mix as explained under Fuel.

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FUEL

1. Use regular leaded or unleaded gasoline with an anti-knock index of 88 or higher, and use John Deere 2-Cycle Oil or a BIA certified 2-cycle engine oil.

2. For the 340 Trailfire, use a 40:1 ratio for the first tank of fuel and a 50:1 ratio thereafter.

3. For the Trailfire LX, pre-mix gasoline and oil in a 50:1 ratio for the first tank of fuel and fill the oil tank with 2-cycle oil. After break-in use gasoline only in fuel tank and 2-cycle oil in oil tank.

NOTE: Mix gasoline and oil in a separate container. Never mix gasoline and oil in the snowmobile fuel tank. Mixing is improved if oil is at room temperature. Oil mixture that has been stored should be agitated thoroughly before using.

4. Capacity of fuel tank is (28.4 L) 7.5 U.S. gals.

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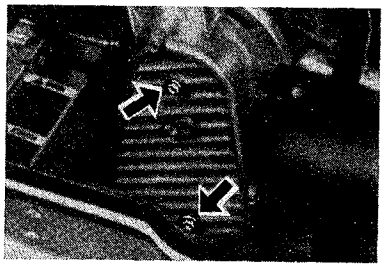
LUBRICANTS



1. Use a good grade of API-GL5 gear oil (SAE 90) in the chain case.

2. Remove lower plug. If oil flows from hole, oil level is satisfactory. To add oil, remove upper plug and add oil until it flows from lower hole. Replace plugs.

3. Chain case oil should be changed at 200 hours, 2 years or 1000 miles, whichever occurs first.

M23317/1197/1020C/080681

Section 20
ENGINE

CONTENTS

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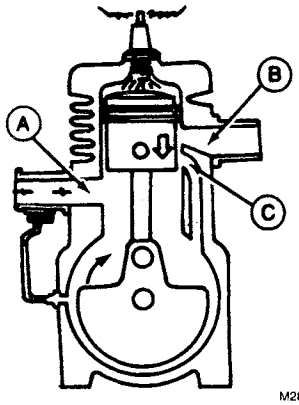
POWER STROKE

NOTE: Power, exhaust and fuel transfer all occur on the downstroke and compression and intake occur on the upstroke.

Slightly before top-dead center (TDC) ignition occurs. Pressure of the burning gases pushes the piston down providing power to turn the crankshaft.

As the piston moves down it exposes the exhaust and transfer ports. The intake port remains closed.

A—Intake Port **B—Exhaust Port** **C—Transfer Port**

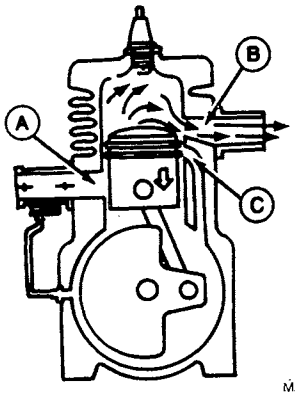


M28434/1197/2005A/100681

EXHAUST STROKE

The exhaust port is uncovered first. Hot gases, under pressure from combustion, escape through the open exhaust port.

A—Intake Port
B—Exhaust Port
C—Transfer Port



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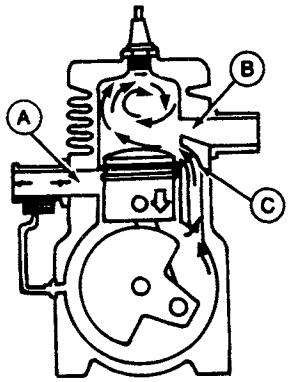
FUEL TRANSFER STROKE

After uncovering the exhaust port, the piston moves down, exposing the transfer port. The intake port is still closed.

The downward movement of the piston pressurizes the crankcase and forces the fuel-air mixture in the crankcase up and out the transfer port into the combustion chamber. This new charge of fuel and air helps drive out any remaining exhaust gases.

A—Intake Port **B—Exhaust Port** **C—Transfer Port**



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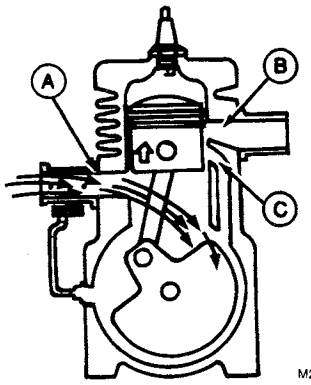
COMPRESSION AND INTAKE STROKE

As the piston moves up it closes off the transfer (C) and exhaust port (B) and opens the intake port (A). This also creates a partial vacuum in the crankcase. Atmospheric pressure forces a new charge of fuel and air from carburetor through intake port to the crankcase.

The piston moving up also compresses the fuel-air mixture in the combustion chamber. Just before the piston reaches TDC, a spark from the spark plug ignites the mixture and it starts to burn.



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DIAGNOSE MALFUNCTIONS

ENGINE WILL NOT START
- Carburetor and/or fuel pump faulty.
- Spark plugs faulty.
- Fuel lines obstructed.
- Head gasket leaking.
- Electrical connections loose.
- No engine compression.

ENGINE STARTS WITH DIFFICULTY
- Carburetor out of adjustment.
- Choke not functioning properly.
- Spark plugs fouled.
- Ignition coil weak.
- Fuel mixture incorrect.
- Ignition out of time.
- Water in fuel system.
- Drive belt too tight.

ENGINE WON'T CRANK
- Piston seized.
- Crankshaft seized to bearings.
- Connecting rod broken.
- Faulty recoil starter.

ENGINE WILL NOT IDLE PROPERLY
- Carburetor idle adjustments incorrect.
- Air screw on carburetor not adjusted.
- Head gasket leaking.
- Fuel mixture incorrect.
- Crankshaft seal leaking.
- Impulse tube to fuel pump obstructed or leaking.
- Drive belt too tight.

ENGINE MISSES AT HIGH SPEEDS
- Ignition out of time.
- Fuel pump faulty.
- Head gasket leaking.
- Ignition coil weak.
- Incorrect main jet in carburetor.
- Impulse tube to fuel pump obstructed or leaking.
- Spark plugs fouled.

ENGINE OVERHEATED
- Wrong main jet in carburetor.
- Ignition out of time.
- Air leak in intake system or crankcase.
- Cooling fan drive belt broken or slipping.
- Cooling fins obstructed or damaged.
- Cooling fan broken or damaged.
- Spark plugs incorrect.
- Engine idling for long period of time.

ENGINE RUNS ROUGH AND SMOKES
- Improper fuel mixture.
- Choke plunger not seated.
- Muffler obstructed.
- Water in fuel.

ENGINE KICKS BACK AND BACKFIRES
- Ignition out of time.
- Lean fuel mixture.
- Flywheel key sheared.

ENGINE LOSES POWER OR ACCELERATION
- Carburetor out of adjustment.
- Engine overheating.
- Ignition out of time.
- Ignition coil weak.
- Fuel mixture incorrect.
- Muffler obstructed.
- Running on one cylinder.
- Restricted in-line fuel filter.
- Belt too loose.

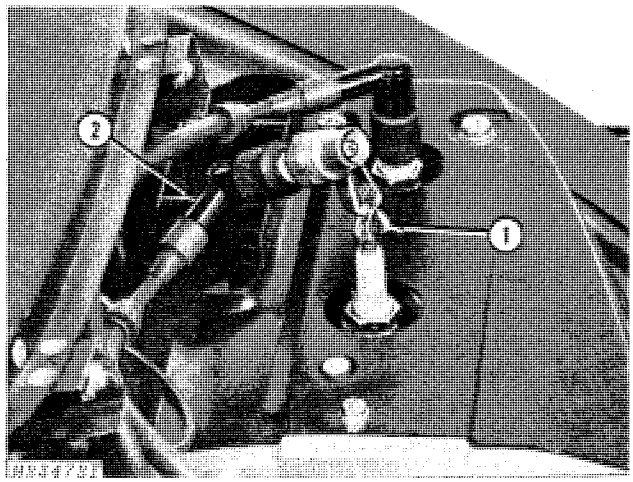
RECOIL STARTER PAWLS NOT EXTENDING WHEN ROPE IS PULLED
- Friction spring broken allowing friction plate to rotate.
- Retaining nut loose.

RECOIL STARTER PAWLS NOT RETURNING WHEN ROPE IS RELEASED
- Return spring broken.
- Return spring not assembled properly.

RECOIL STARTER ROPE NOT RETURNING
- Main spring broken or unhooked.
- No lubrication between friction plate and washer.
- Too much lubrication between friction plate and washer.

1197/2005E/100681

ENGINE SPARK TEST



1. Ground JDM-74A-5 Tester Plug to the engine spark plug.
2. Connect high tension lead to the tester plug.
3. Turn the key switch to the "ON" position.
4. Pull the recoil start rope and check tester plug for spark.
5. Check both cylinders.
6. If CDI system cannot fire the tester plug, ignition system difficulties exist.

CAUTION: High energy ignition systems can produce injurious electrical shock. DO NOT hold spark plugs, leads or connectors in your hand to check for spark.

7. If spark is good and engine does not start, make compression test and check fuel supply.

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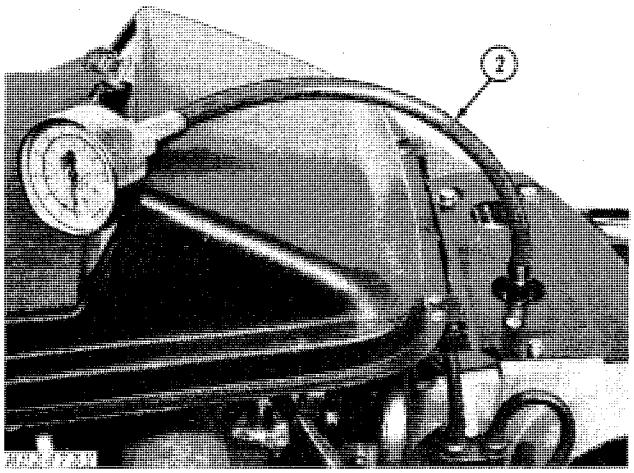
ENGINE COMPRESSION TEST



1. Remove spark plugs.
2. Install compression gauge in one of the spark plug holes.
3. With choke "OFF", hold throttle in open position.
4. Pull recoil start rope and crank engine vigorously. Test both cylinders for compression.
5. Compression pressure should be as follows:

   340 Engine - (861 to 965 kPa)
   125 to 140 psi

   440 Engine - (896 to 1 068 kPa)
   130 to 155 psi

Pressure should not vary more than (69 kPa) 10 psi between cylinders. Minimum pressure for a used engine is (689 kPa) 100 psi.

6. If compression pressure is low, check for head gasket leakage, worn or stuck piston rings, damaged pistons or damaged cylinder walls.

M23473/1197/2005G/100681

REMOVE ENGINE

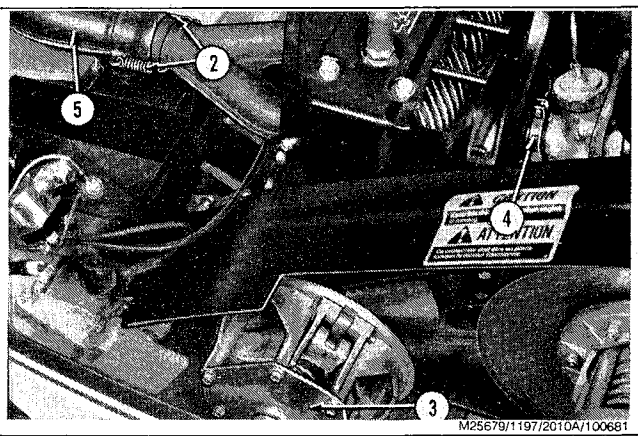
1. Remove hood.

2. Remove springs securing muffler to exhaust manifold. Remove muffler.

3. Remove clutch.

4. Disconnect carburetor flange from intake manifold.

5. Remove muffler.



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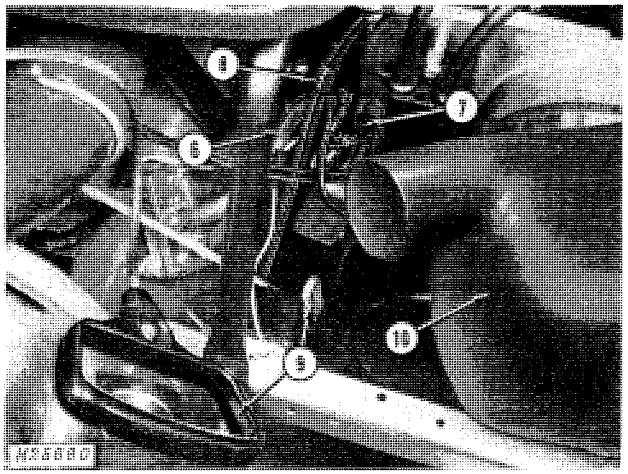
6. Disconnect impulse line from engine.

7. Disconnect wiring harness connector.

8. Remove wiring harness from clamp.

9. Tie a knot in recoil start rope to hold it and remove handle.

10. Remove air intake duct on Trailfire LX and 340 and 440 Trailfire (Serial No. 120,001-).



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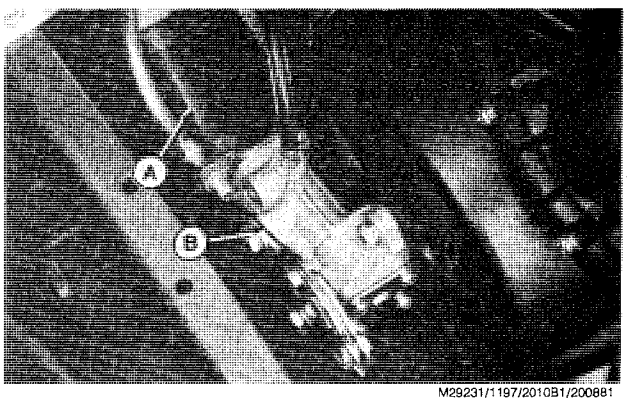
11. On Trailfire LX, remove and plug oil supply line (A) at oil pump.

12. On Trailfire LX, disconnect cable (B) from oil pump lever and bracket.



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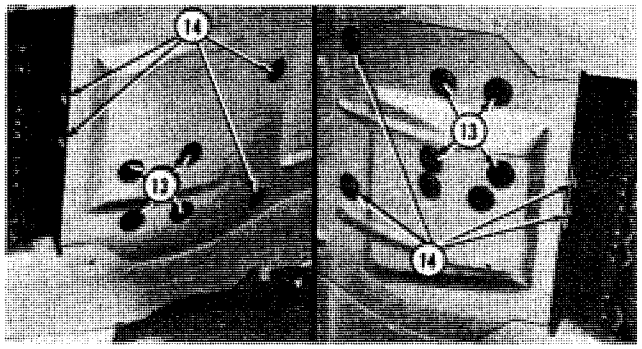
13. Remove plugs for access to engine mount bolts. Remove bolts and lift engine out.

14. If engine mount must be replaced, remove these four bolts.



(Serial No. 95,001-120,000) *(Serial No. 120,001-)*

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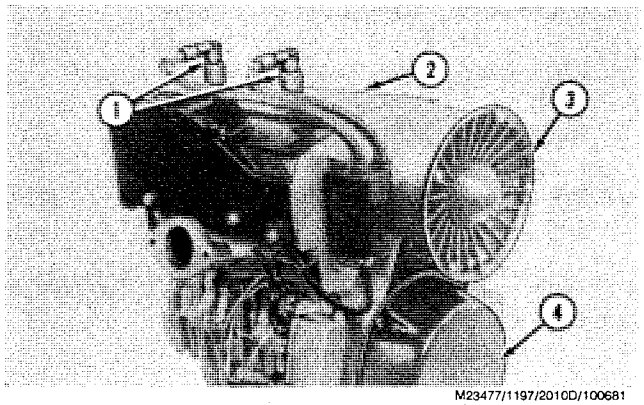
REMOVE ENGINE EXTERIOR COMPONENTS

1. Disconnect spark plug leads.

2. Remove top shroud.

3. Remove fan cover.

4. Remove recoil starter. On Trailfire LX, remove oil pump and oil lines, then remove recoil starter.



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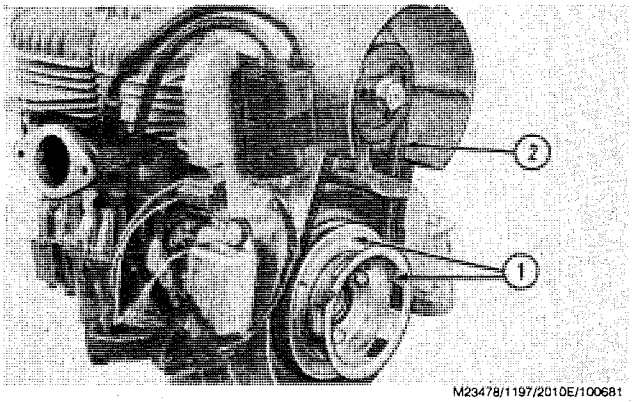
REMOVE FAN HOUSING

1. On Trailfire LX, remove oil pump drive shaft from drive hub. Remove starter cup (and drive hub on Trailfire LX) and flywheel pulley.

2. Remove fan belt.



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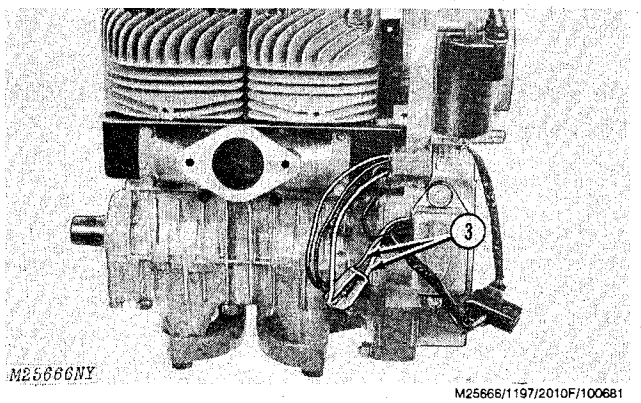
3. Disconnect red and white ignition leads.



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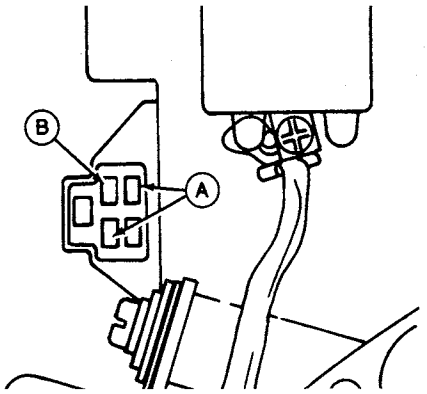
4. Remove two yellow leads (A) and one brown lead (B) from connector. Mark their location for reassembly.

5. Remove fan housing.



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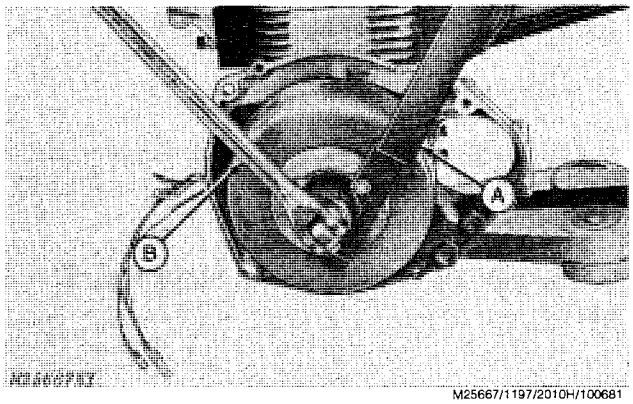
REMOVE FLYWHEEL

1. Bend up tangs on lock washer.

2. Remove flywheel nut and lockwasher.

NOTE: Modify JDM-64-1 Flywheel Holding Tool by drilling out holes to (9.5 mm) 3/8-inch. Elongate holes to fit flywheel.

A—JDM-64-1 Flywheel Holding Tool
B—Breaker Bar



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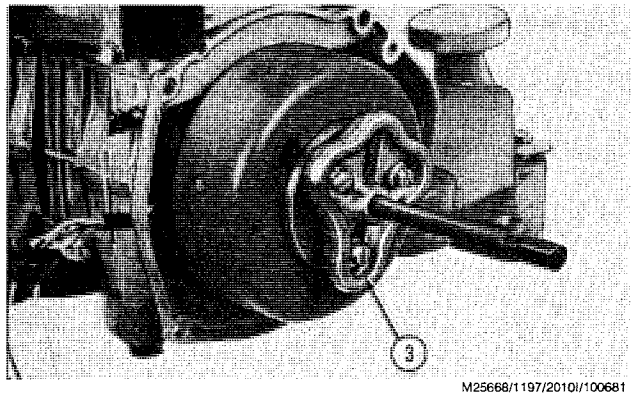
3. Remove flywheel with an air or electric impact wrench and JDM-9 Puller.



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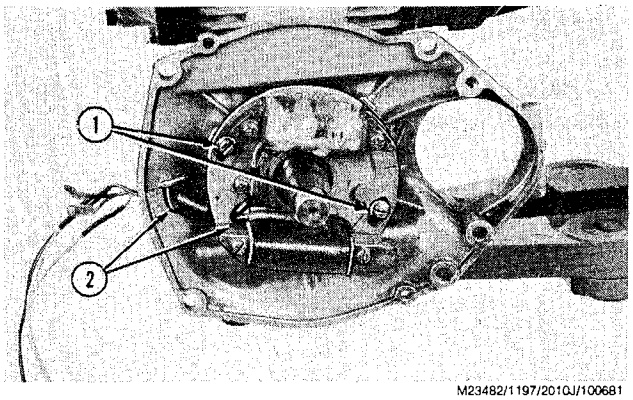
REMOVE STATOR

1. Remove stator screws.

2. Remove stator. Pull leads and grommet through crankcase.



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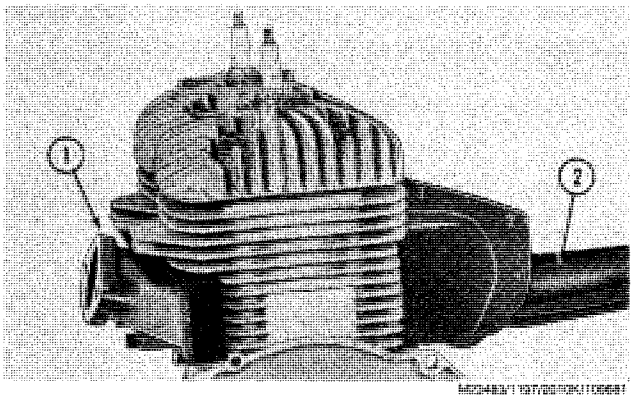
REMOVE MANIFOLDS

1. Remove intake manifold, sheet metal and gaskets.

2. Remove exhaust manifold, sheet metal and gaskets.

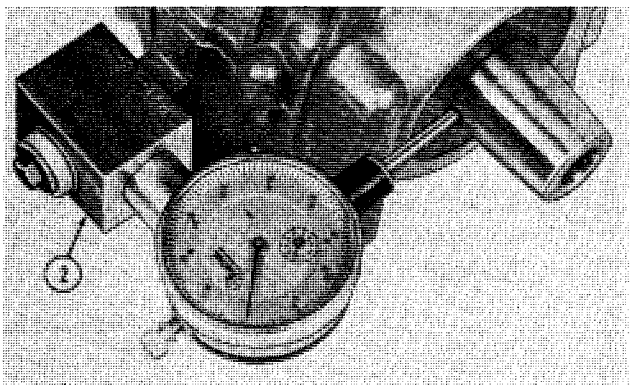


CHECK CRANKSHAFT RUNOUT

1. Remove spark plugs.

2. Use JDM-10 Mounting Bracket to install a dial indicator just before the taper on PTO end of crankshaft. Rotate crankshaft.

3. Replace crankshaft if runout exceeds (0.05 mm) 0.002 inch.



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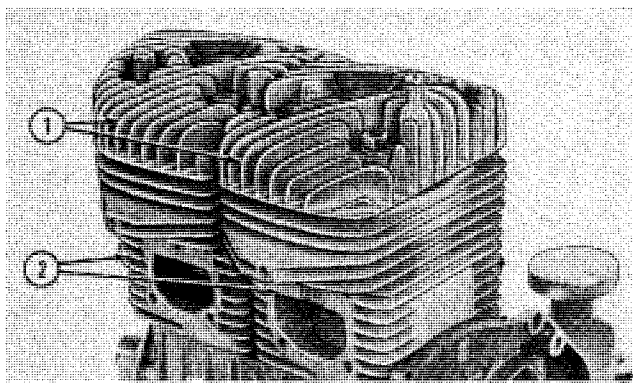
REMOVE CYLINDERS AND HEADS

1. Remove cylinder heads and gaskets.

2. Remove cylinders and gaskets.



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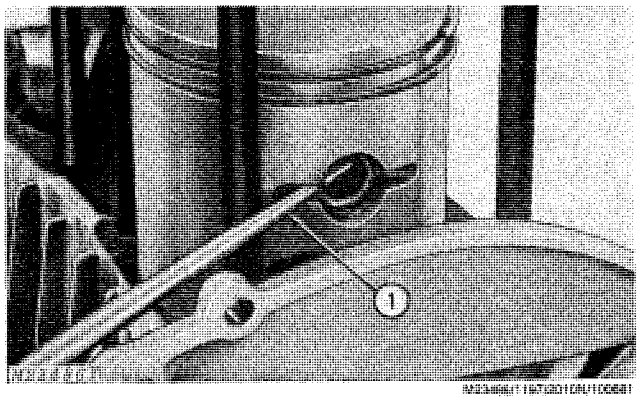
REMOVE PISTONS

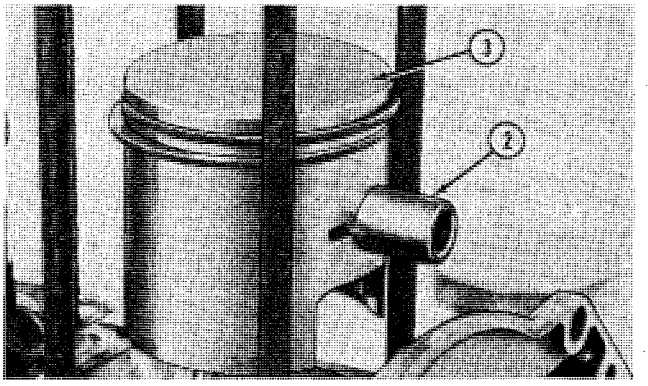
1. Remove piston pin retainer with an awl. Use NEW retainers for assembly.



2. Warm piston with your hands and push piston pin out.

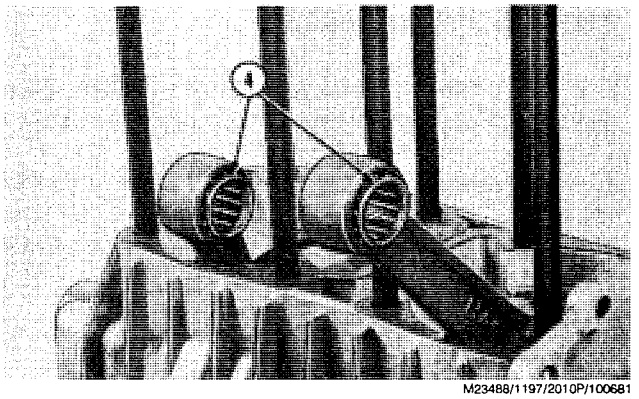
NOTE: If pin can't be pushed out by hand, use JDM-7 tool set with JDM-32 guide.

3. Remove piston.



M23487/1197/2010O/100681

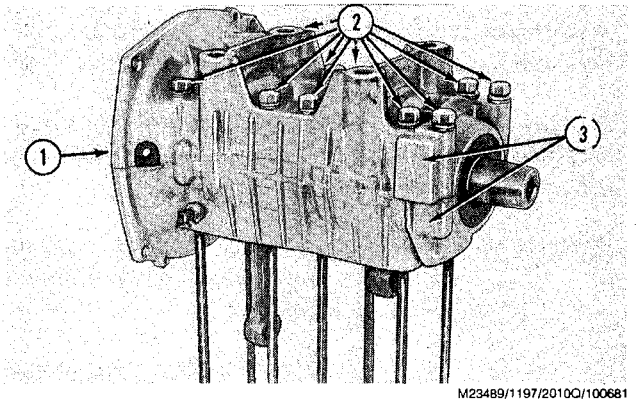
4. Remove piston pin needle bearings.



M23488/1197/2010P/100681

SEPARATE CRANKCASE HALVES

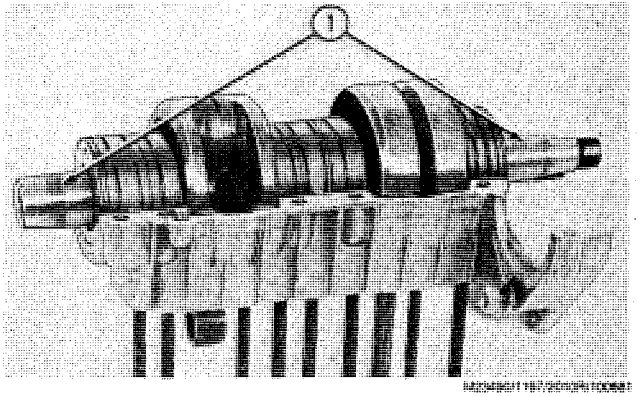
1. Set crankcase on a bench.
2. Remove crankcase bolts.
3. Separate crankcase halves.



M23489/1197/2010Q/100681

REMOVE CRANKSHAFT

1. Lift crankshaft out of upper crankcase half.

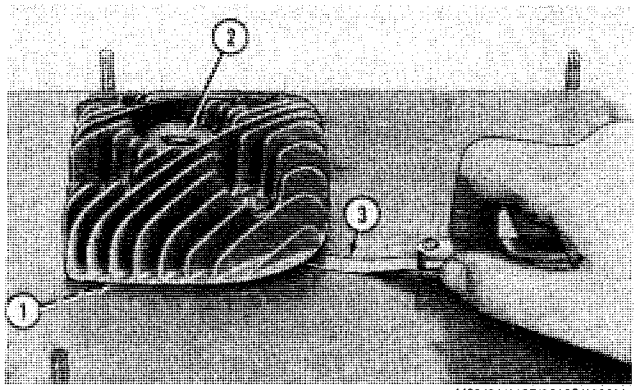


INSPECT CYLINDER HEADS

1. Scrape carbon deposits from cylinder head with a soft metal (non-ferous) scraper.

2. Clean spark plug threads with a spark plug tap (14 mm).

3. Set cylinder head on a surface plate and check at various points around head with a (0.0254 mm) 0.001 inch feeler gauge. If there is any distortion, replace the cylinder head.

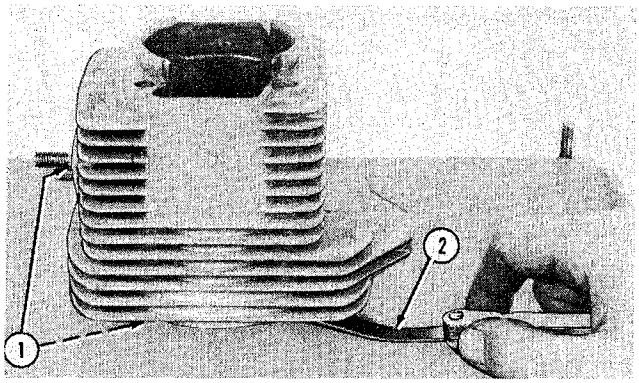


M23491/1197/2010S/100681

INSPECT CYLINDERS

1. Clean carbon from exhaust port and gasket material from cylinder surface with a soft metal (non-ferous) scraper.

2. Set cylinder on a surface plate and check at various points around the cylinder with a (0.0254 mm) 0.001 inch feeler gauge. If there is any distortion, replace the cylinder.



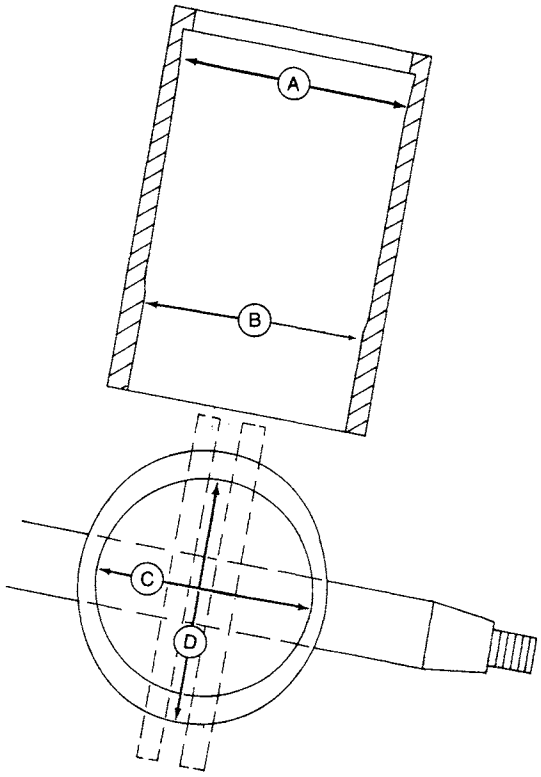
M23492/1197/2010T/100681

3. Measure cylinder bore at C and D in position A of cylinder. Measure cylinder bore at C and D in position B of cylinder.

4. If any dimension exceeds (60.10 mm) 2.3661 inch on the 340 engine or (68.10 mm) 2.6811 inch on the 440 engine, the cylinder must be replaced.

IMPORTANT: Do not hone or rebore cylinder. It is chrome-plated and must be replaced if out of specification.

A—Top of Ring Travel Zone
B—Bottom of Ring Travel Zone
C—Parallel to Crankshaft
D—Right Angle to Crankshaft



M23493/1197/2010U/110681

INSPECT PISTONS AND RINGS

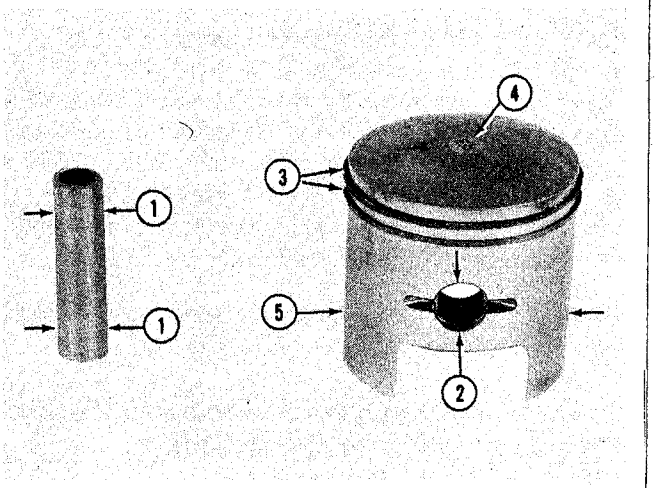
1. Measure piston pin in the two locations shown. If dimension is less than (15.96 mm) 0.6283 inch replace it.

2. Measure piston pin bore dimension on both sides of piston. If either dimension exceeds (16.08 mm) 0.6331 inch replace the piston.

3. Remove the piston rings with a ring expander and clean ring grooves with a ring groove cleaning tool.

4. Check piston for being pitted, scored or corroded. Replace it if necessary. Clean any carbon deposit from top of piston.

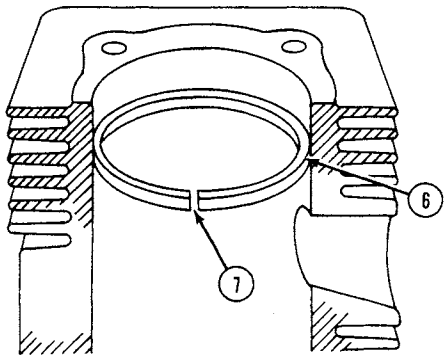
5. Measure the piston diameter at a right angle to the piston pin bore. If dimension is less than (59.82 mm) 2.3551 inch on the 340 engine or (67.82 mm) 2.6701 inch on the 440 engine, replace the piston.



M23494/1197/2010V/110681

6. Use a piston to push the ring into a cylinder that has been inspected and proven correct. Push it into bore (25.4 mm) one inch below top of bore.

7. Measure the ring end gap. End gap should be (0.1524 to 0.2556 mm) 0.006 to 0.014 inch on the 340 engine or (0.2032 to 0.4064 mm) 0.008 to 0.016 inch on the 440 engine. If end gap is incorrect, the ring is incorrect or worn. Replace it.

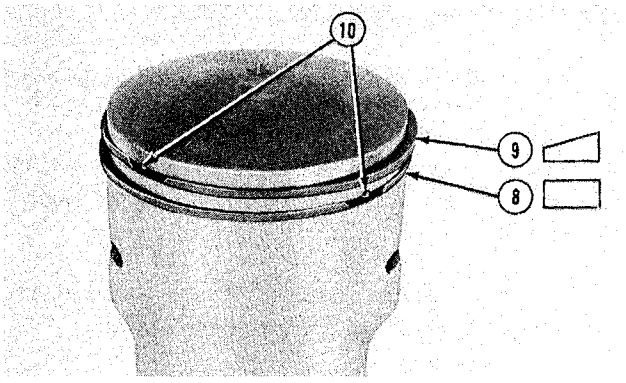


M23495/1197/2010W/1106081

8. On 340 Trailfire Snowmobiles (Serial No. 95,001-) and 440 Trailfire Snowmobiles (Serial No. 95,001-120,000), install the rectangular ring in the bottom groove. Check the ring groove clearance with a flat feeler gauge. If clearance exceeds (0.19 mm) 0.0075 inch replace the piston and ring. On 440 Trailfire Snowmobiles (Serial No. 120,001-) and Trailfire LX Snowmobiles install the half keystone ring in the bottom groove (with bevel up).

9. Install the half keystone ring in the top groove (with bevel up).

10. Make sure both rings are located so that pins are in the end gap and widest part of ring gap is up.

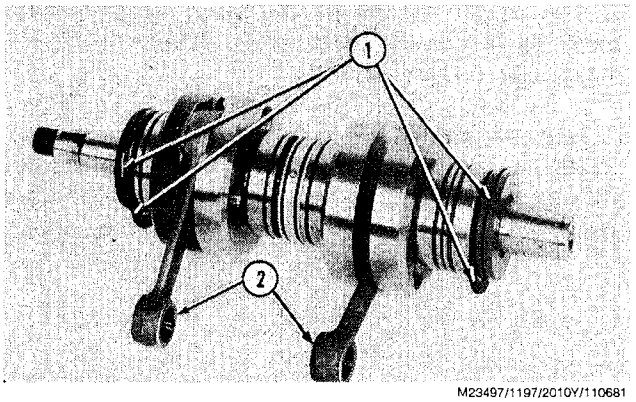


M23496/1197/2010X/110681

INSPECT CRANKSHAFT

1. Remove crankshaft seals and retainers. Replace the seals if they are damaged.

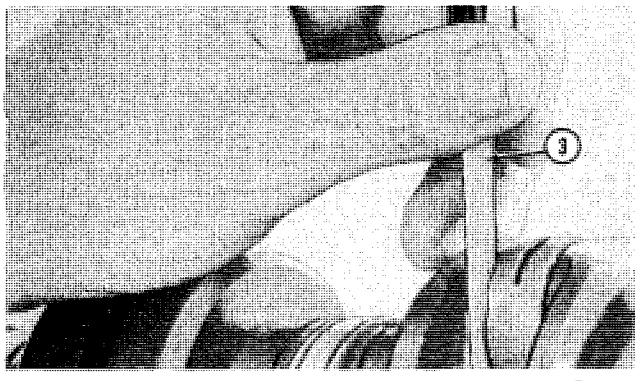
2. Measure the connecting rod inside diameter. If diameter exceeds (20.05 mm) 0.7894 inch, replace the crankshaft assembly.



M23497/1197/2010Y/110681

3. Move the connecting rod to one side and measure the clearance on opposite side with a feeler gauge. If clearance exceeds (0.70 mm) 0.0276 inch, replace the crankshaft.

4. Rotate the five crankshaft bearings. If any rotate roughly or are frozen, they are damaged. The outside bearings can be replaced but the inner bearings can be replaced only with a crankshaft assembly.



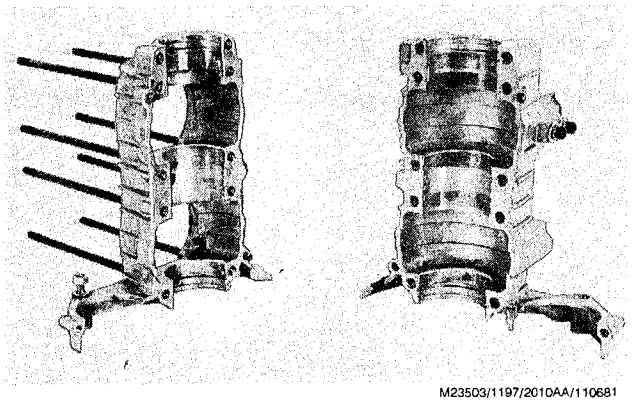
M25398/1197/2010Z/110681

INSPECT CRANKCASE

1. Clean sealer off crankcase surface and check surface for deep scratches, pitting or scoring.

2. Check bearing surfaces and retainer slots for conditions that could cause leaks. Minor indication of bearing outer race rotation is normal.

3. Crankcase halves are available only as a matched set.

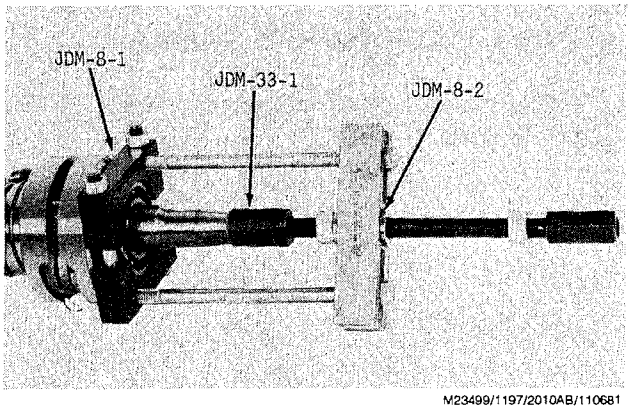


M23503/1197/2010AA/110681

REPLACE OUTER CRANKSHAFT BEARINGS

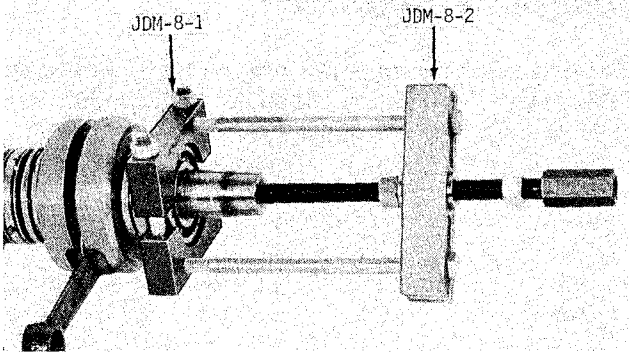
1. Install JDM-33-1 Adapter on crankshaft.

2. Use JDM-8-1 and JDM-8-2 to remove bearing from crankshaft.



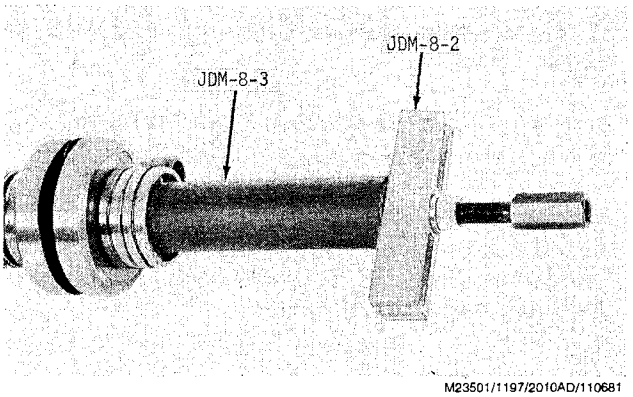
M23499/1197/2010AB/110681

3. Use JDM-8-1 and JDM-8-2 to remove bearings from crankshaft.



M23500/1197/2010AC/110681

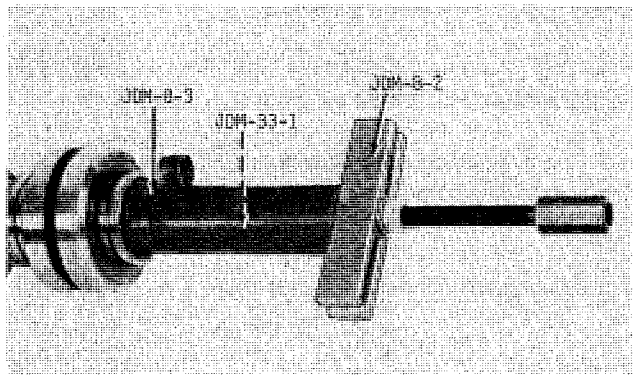
4. Use JDM-8-3 and JDM-8-2 to install bearings on crankshaft.



M23501/1197/2010AD/110681

5. Install JDM-33-1 adapter on crankshaft.

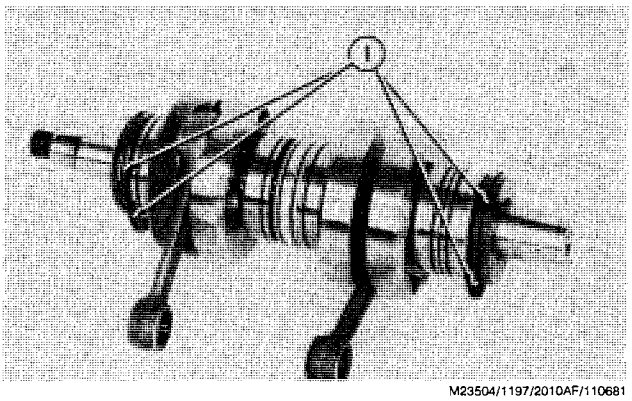
6. Use JDM-8-3 and JDM-8-2 to install bearing on crankshaft.



M23502/1197/2010AE/110681

INSTALL CRANKSHAFT SEALS

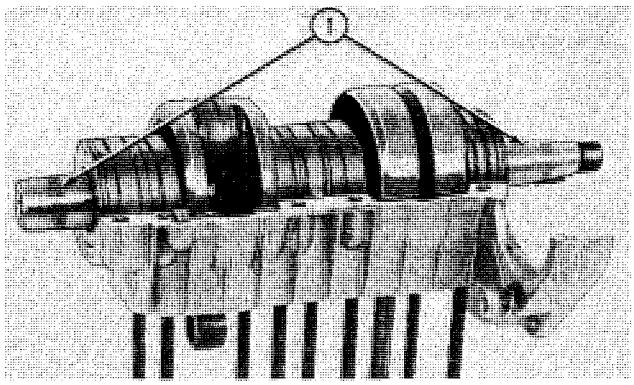
1. Place retainers and oil seals (lip inward) on crankshaft. Lubricate seals.



M23504/1197/2010AF/110681

INSTALL CRANKSHAFT

1. Place upper crankcase half on work bench and install crankshaft. The locating pin on the center spacer must fit into slot in the upper crankcase.

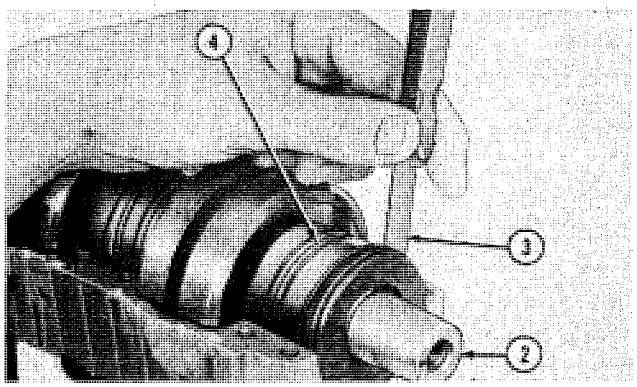


M23490/1197/2010AG/110681

2. Tap crankshaft toward flywheel end of crankcase with a plastic mallet.

3. Check clearance between outer PTO bearing and retainer with a feeler gauge.

4. If end play exceeds (0.76 mm) 0.030 inch, shims must be added between the two outer bearings on the PTO end of crankshaft. Shims are available in (0.1 mm) 0.004 inch and (0.3 mm) 0.010 inch thicknesses.

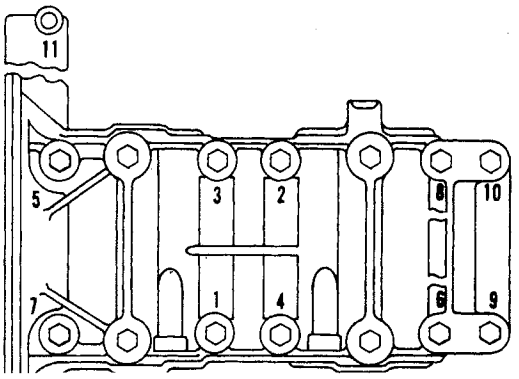


M23505/1197/2010AH/110681

INSTALL LOWER CRANKCASE HALF

1. Apply an even coat of M64850 Silicon Rubber Adhesive to sealing surfaces of both crankcase halves. Do not permit sealer to enter interior of crankcase.

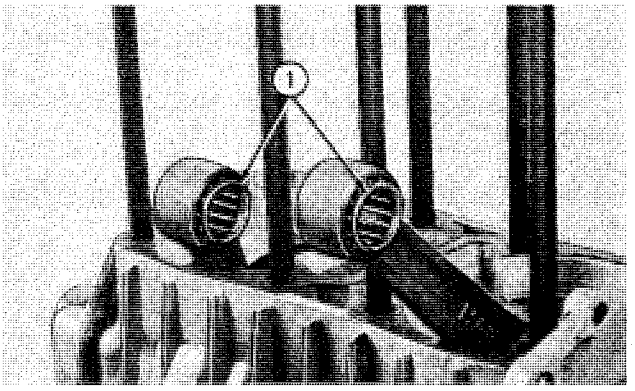
2. Install lower crankcase half and torque nuts to (22 N·m) 16 ft-lbs in sequence shown.



M23506/1197/2010AI/110681

INSTALL PISTONS

1. Place needle bearings in connecting rod.

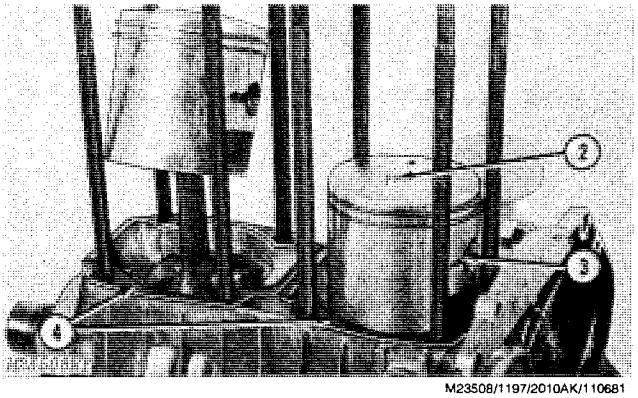


M23507/1197/2010AJ/110681

2. Set piston over connecting rod with arrow pointing toward exhaust side.

3. Push piston pin into piston and connecting rod and install new retainers.

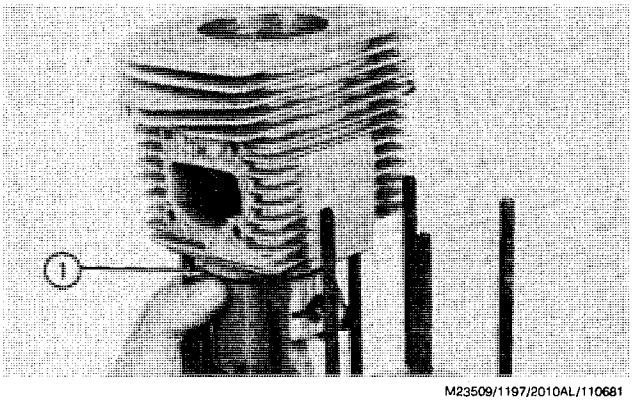
4. Place new cylinder gaskets on crankcase. Make sure they are correctly installed.



M23508/1197/2010AK/110681

INSTALL CYLINDERS AND HEADS

1. Make sure piston ring end gaps are centered over pin, then compress the rings with your fingers while you install the cylinder.



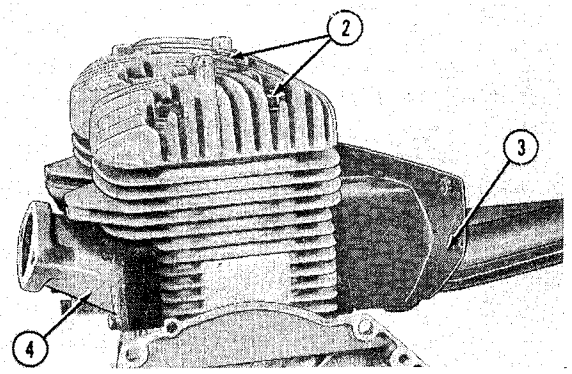
M23509/1197/2010AL/110681

2. Install cylinder heads. Do not tighten hardware.

3. Install exhaust manifold, sheet metal and gaskets. Torque hardware to (18 to 22 N·m) 13 to 16 ft-lbs.

4. Install intake manifold, sheet metal and gaskets. Torque hardware to (6 to 8 N·m) 4 to 6 ft-lbs.

5. Torque cylinder head hardware in a criss-cross pattern to (22 N·m) 16 ft-lbs.



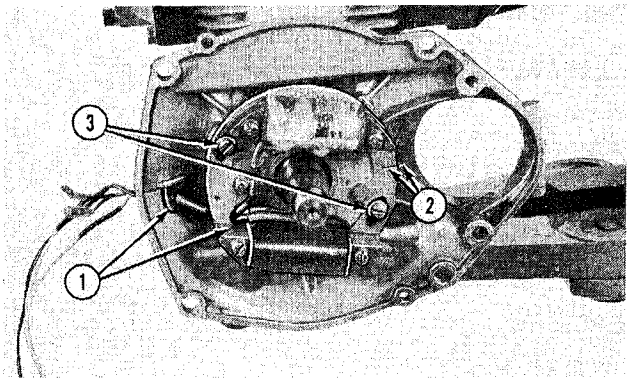
M23510/1197/2010AM/110681

INSTALL STATOR AND TIME IGNITION

1. Guide stator leads through grommet and set stator against crankcase.

2. Align mark on stator with top of ledge on crankcase. This is the only timing required for the ignition.

3. Tighten stator screws.



M23511/1197/2010AN/110681

INSTALL FLYWHEEL

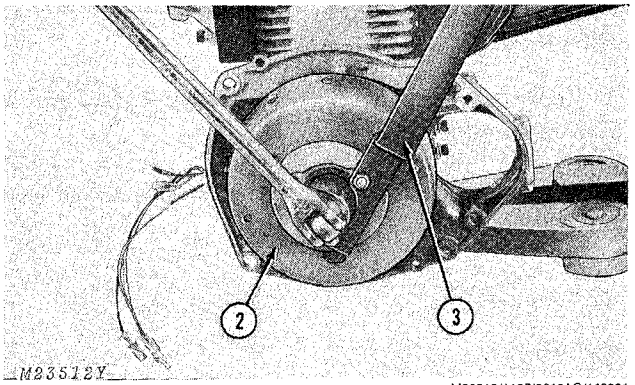
1. Install flywheel key in keyway on crankshaft.

2. Install flywheel, lock washer and nut.

NOTE: Lock washer has a tang to engage keyway.

3. Hold flywheel with JDM-64-1 Flywheel Holding Tool and torque flywheel nut to (81 N·m) 60 ft-lbs.

4. Bend tabs on lock washer to secure nut.



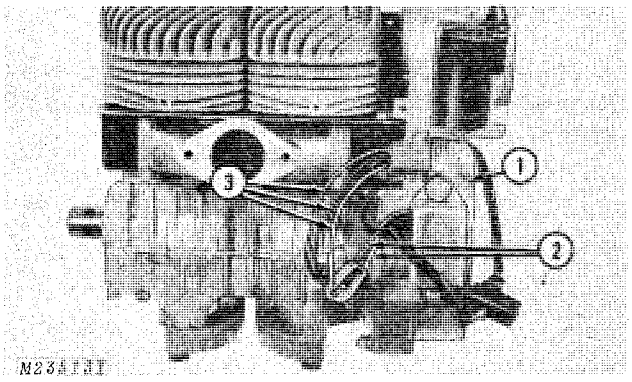
M23512/1197/2010AO/110681

INSTALL FLYWHEEL HOUSING

1. Install flywheel housing.

2. Connect red and white ignition leads.

3. Install two yellow leads and one brown lead in connector as marked when removed.



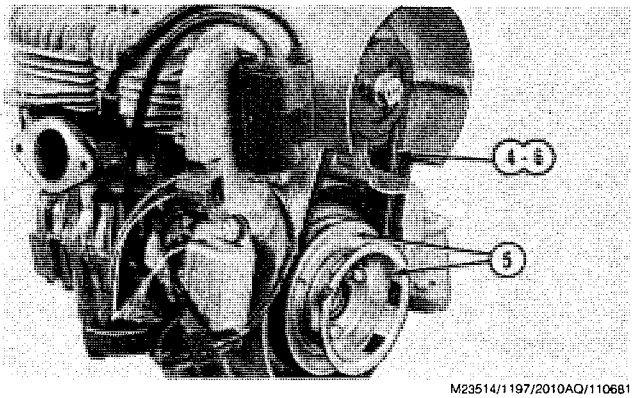
M23513/1197/2010AP/110681

4. Install fan belt.

5. Install flywheel pulley and starter cup.

NOTE: On Trailfire LX, install drive hub and starter cup. The extended center of drive hub must face away from flywheel.

6. Check and adjust fan belt tension.



M23514/1197/2010AQ/110681

7. On Trailfire LX, cover drive shaft with John Deere AT30408 High Temperature Grease, or equivalent. Slip drive shaft into drive hub until it bottoms.

1197/2010AQ1/200881

INSTALL EXTERIOR COMPONENTS

1. Install recoil starter (A). On Trailfire LX, check that drive shaft (B) goes through hole in center of recoil starter.

2. On Trailfire LX, install oil pump on recoil starter. Align square hole in oil pump (C) with drive shaft in recoil starter and slip oil pump on to recoil starter.

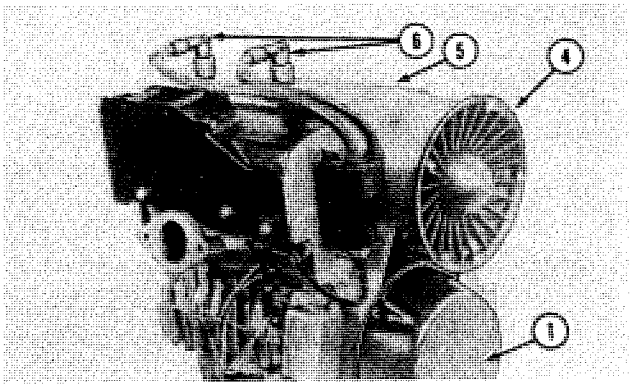
3. On Trailfire LX, install oil injection lines. Secure lines to flywheel housing with clamp.

NOTE: Install longer line from BOTTOM fitting of oil pump to clutch side check valve on intake manifold. Route line below recoil start rope. Install shorter line from TOP fitting of oil pump to recoil starter side check valve on intake manifold. Route line above recoil start rope.

4. Install fan cover.

5. Install top shroud.

6. Install spark plugs. Tighten spark plugs to (27 N·m) 20 ft-lbs torque. Connect spark plug leads.



M29233/1197/2010AR/200881

PRESSURE TEST ENGINE

1. Place a rubber sheet between exhaust manifold and cylinder.

2. Place a rubber sheet between carburetor flange and intake manifold. Torque bolts to (5.8 N·m) 4.3 ft-lbs.

3. Connect pressure regulator to impulse fitting.

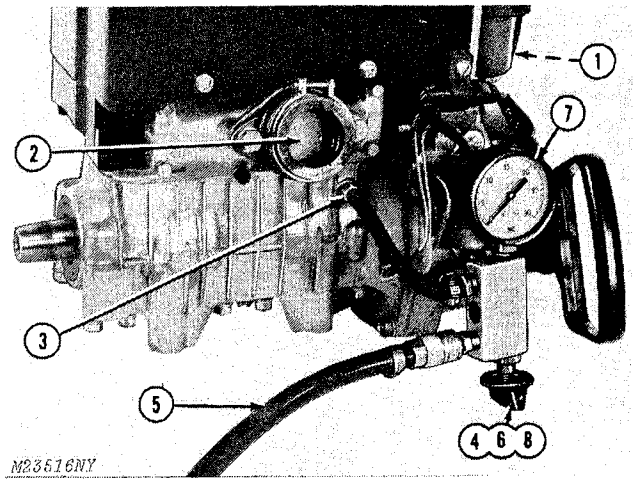
4. Close regulator valve.

5. Connect shop air to regulator.

6. Open valve until gauge reads (48.3 kPa) 7 psi. Then, close valve.

7. Gauge needle should not drop below (34.5 kPa) 5 psi for at least 10 seconds.

8. If needle drops before 10 seconds, open valve to maintain (48.3 kPa) 7 psi. Apply a liquid soap solution to seals and seams to locate leaks.



M23516/1197/2010AS/110681

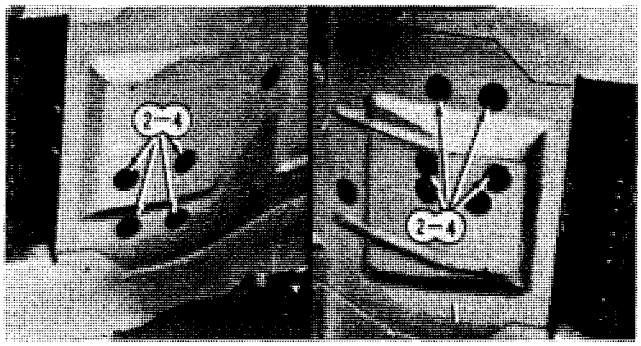
INSTALL ENGINE

1. Place engine on engine mount.

2. Install engine mount bolts snugly.

3. Check clutch alignment.

4. Torque bolts to (68 N·m) 50 ft-lbs and install pan plugs.



(Serial No. 95,001-120,000) *(Serial No. 120,001-)*

M30171/1197/2010AT/110681

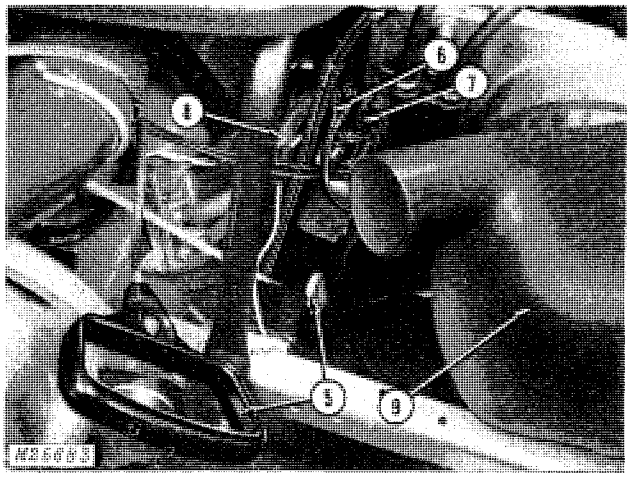
5. Install handle and release knot in recoil start rope.

6. Place wiring harness in clamp.

7. Connect wiring harness connector.

8. Connect impulse line to engine.

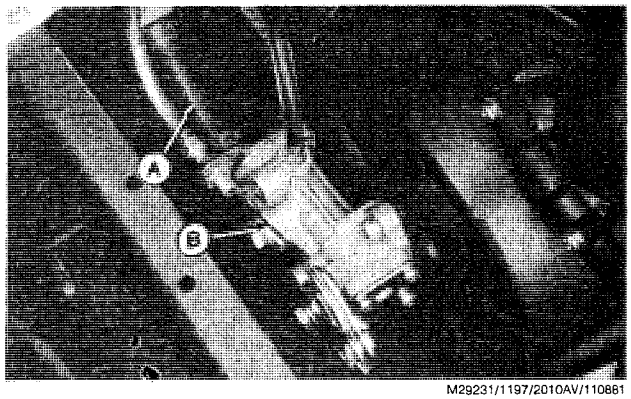
9. Install air intake duct on Trailfire LX and 340 and 440 TRAILFIRE Snowmobiles (Serial No. 120001-)



M25683/1197/2010AU/110681

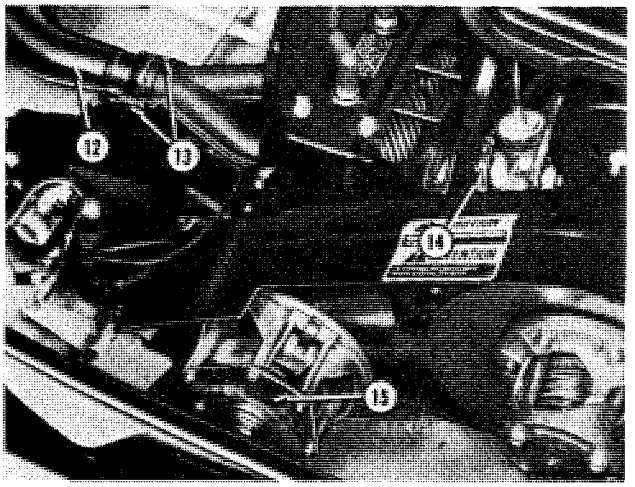
10. On Trailfire LX, connect cable (B) to oil pump lever and bracket. See Section 30 for proper cable adjustment.

11. On Trailfire LX, connect oil supply line (A) to oil pump.



M29231/1197/2010AV/110881

12. Install muffler.
13. Install muffler springs.
14. Correct carburetor to intake manifold.
15. Install clutch.
16. Install hood.



M29236/1197/2010AW/110681

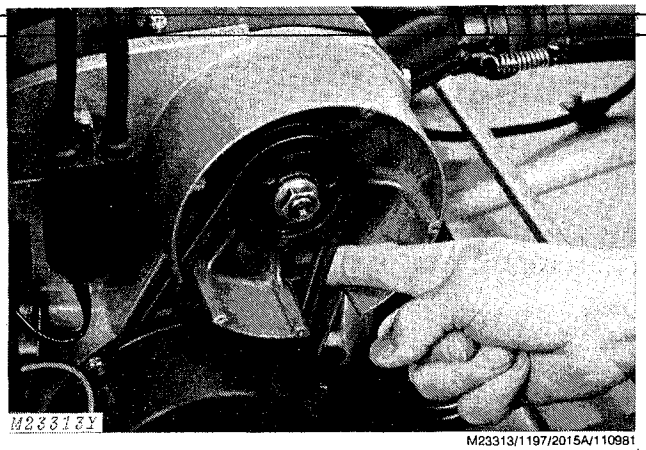
CHECK FAN BELT TENSION

1. Remove air intake duct, 340 and 440 Trailfire (Serial No. 120,001-) and Trailfire LX.

2. Remove fan cover.

3. Press against belt, (9.52 mm) 3/8 inch maximum deflection allowed.

4. Inspect belt, replace frayed, worn or damaged belts.

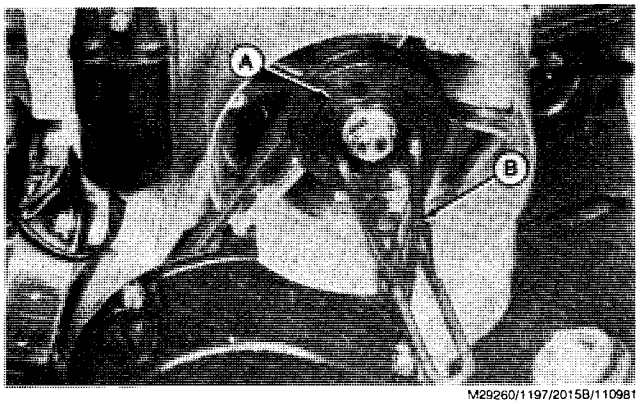


M23313/1197/2015A/110981

ADJUST FAN BELT TENSION

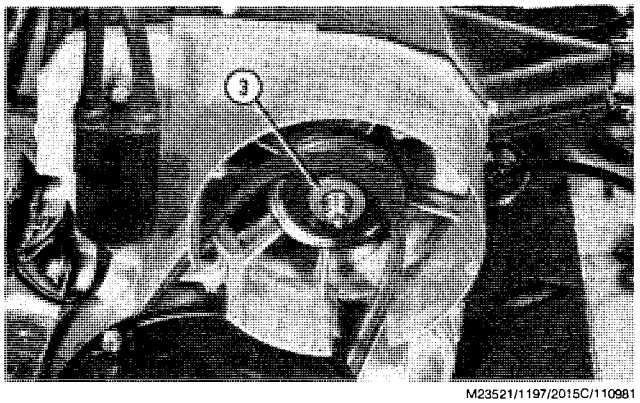
1. Hold fan sheave (A) with JDM-112 Holding Tool (B), remove nut.

2. Remove outer sheave half.



M29260/1197/2015B/110981

3. Remove shims to loosen belt; add shims to tighten belt.

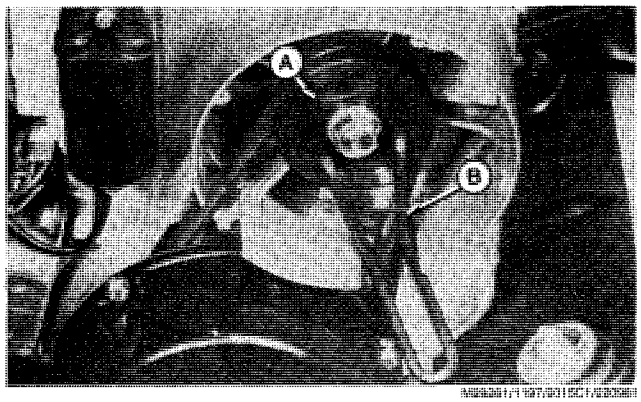


M23521/1197/2015C/110981

4. Install outer sheave half (A). Place left over shims on shaft. Install lockwasher and nut.

5. Hold sheave with JDM-112 Holding Tool (B) and tighten nut to (64 N·m) 47 ft-lbs.

6. Check belt tension.



REPLACE FAN BELT

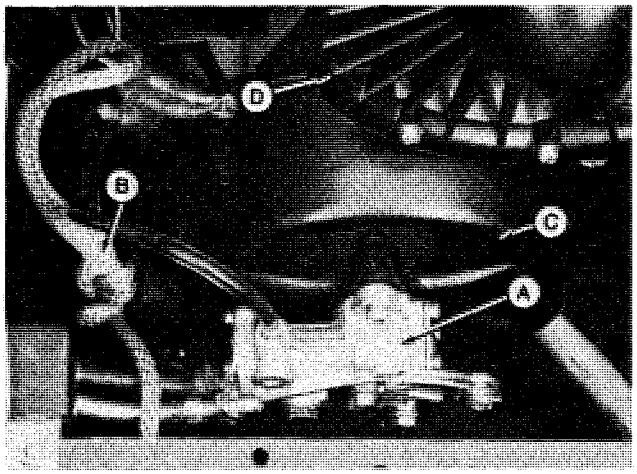
1. Remove air intake duct, 340 and 440 Trailfire (Serial No. 120,001-) and Trailfire LX.

2. Remove oil pump (A) from recoil starter housing Trailfire LX (Serial No. 190,001-).

3. Remove starter handle, tie a knot in recoil starter rope (B).

4. Remove recoil starter (C).

5. Remove fan cover (D).

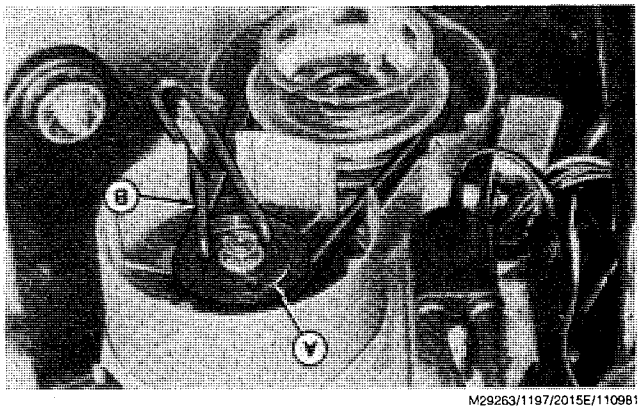


A—Pump
B—Starter Rope
C—Recoil Starter
D—Fan Cover

M29262/1197/2015D/110981

6. Hold fan sheave (A) with JDM-112 Holding Tool (B), remove nut and washer.

7. Remove outer sheave half (A).



M29263/1197/2015E/110981

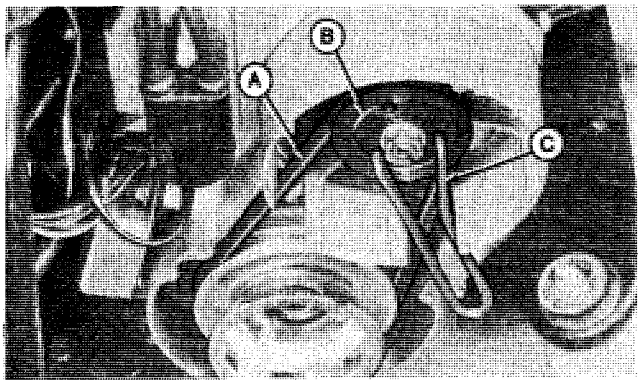
8. Place all shims on shaft.

9. Install belt (A).

10. Install outer sheave half (B), lockwasher and nut.

11. Hold fan sheave with JDM-112 Holding Tool (C), tighten nut (64 N·m) 47 ft-lbs.

12. Check belt tension.



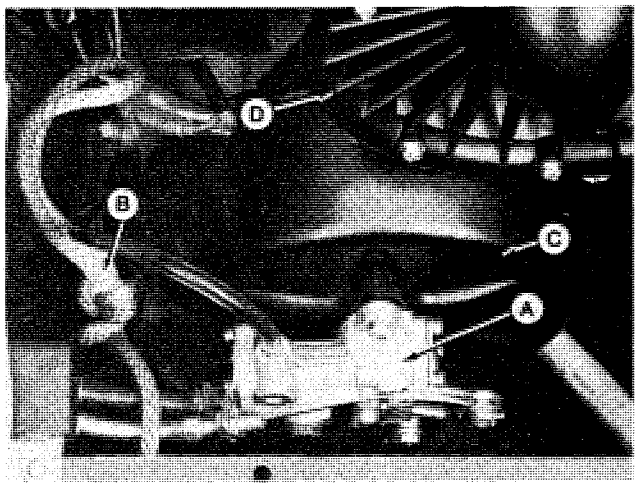
M29264/1197/2015F/140981

13. Install fan cover (D).

14. Install recoil starter (C), handle, untie knot in rope (B).

15. Install oil pump (A), Trailfire LX (Serial No. 190,001-).

16. Install air intake duct, 340 and 440 Trailfire (Serial No. 120,001-) and Trailfire LX.



A—Pump
B—Starter Rope
C—Recoil Starter
D—Fan Cover

M29262/1197/2015G/220981

REPLACE FAN OR FAN BEARINGS

1. Remove air intake duct, 340 and 440 Trailfire (Serial No. 120,001-), and Trailfire LX.

2. Remove oil pump Trailfire LX (Serial No. 190,001-).

3. Remove recoil starter and fan cover.

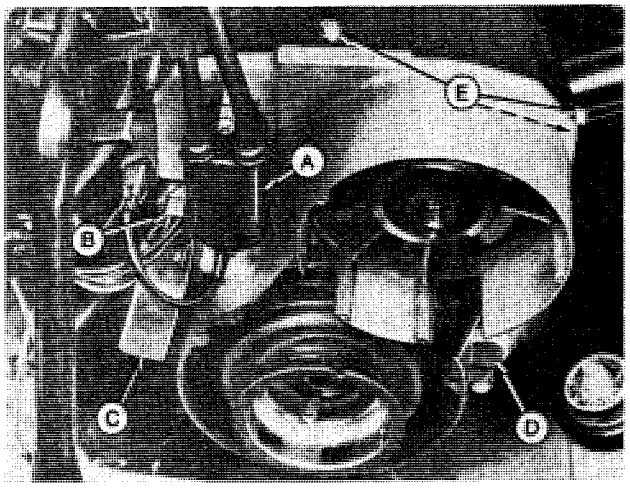
4. Remove fan belt.

5. Remove coil (A) from fan housing.

6. Remove connectors (B).

7. Remove CDI unit (C) from fan housing, 340 (Serial No. -155,093) and 440 Trailfire (Serial No. - 190,000).

8. Remove fan housing (D) and screws (E).

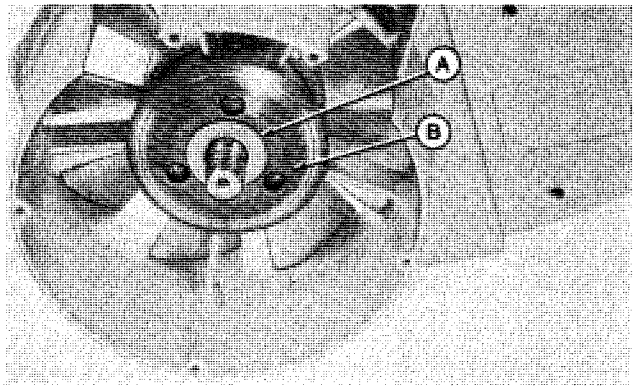


A—Coil
B—Connectors
C—CDI Unit
D—Fan Housing
E—Fan Housing Mounting Screws

M29266/1197/2015H/140981

8. Remove key, shims (A), and inner sheave half (B).

9. Remove fan.

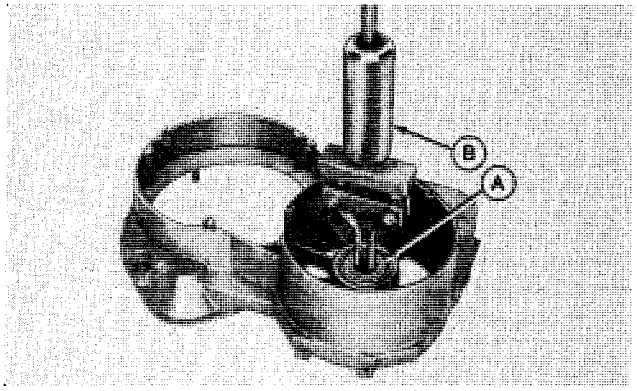


M29267/1197/2015I/211181

10. Inspect bearings; replace both if one is damaged.

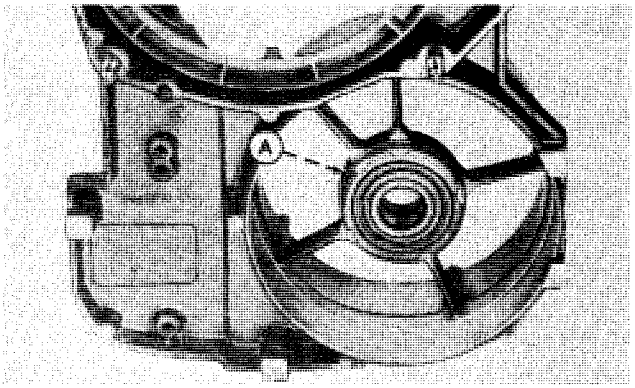
11. Remove bearing (A) with puller (B).

IMPORTANT: Inspect washers between bearings. Replace if damaged.



M29268/1197/2015J/211181

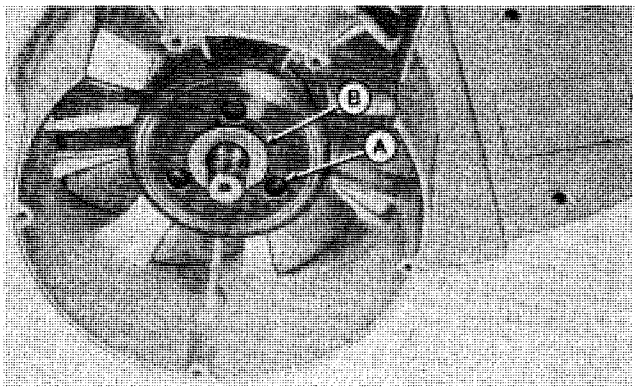
12. Press bearings into housing (A) until fully seated.



M29269/1197/2015K/211181

13. Place fan in housing.

14. Install inner sheave half (A), shims (B) and key.



M29270/1197/2015L/211181

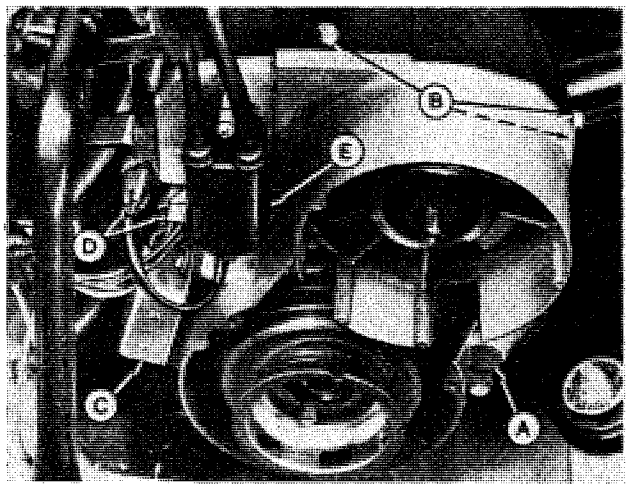
16. Install fan housing (A) with screws (B).

17. Attach CDI unit (C) to fan housing, 340 (Serial No. -155,093) and 440 Trailfire (Serial No. - 190,000).

18. Attach connectors (D).

19. Install coil (E).

A—Fan Housing
B—Fan Housing Mounting Screw
C—CDI Unit
D—Connectors
E—Coil

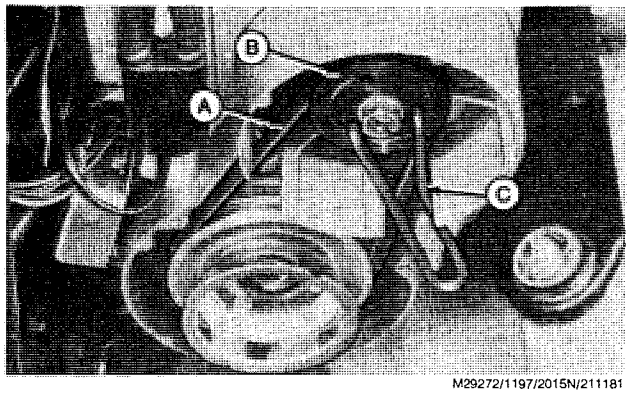


M29271/1197/2015M/211181

20. Place belt (A) in inner sheave half, install outer sheave half (B), lock washer and nut.

21. Hold sheave with JDM-112 Holding Tool (C), torque nut to (64 N·m) 47 ft-lbs.

22. Check belt tension.



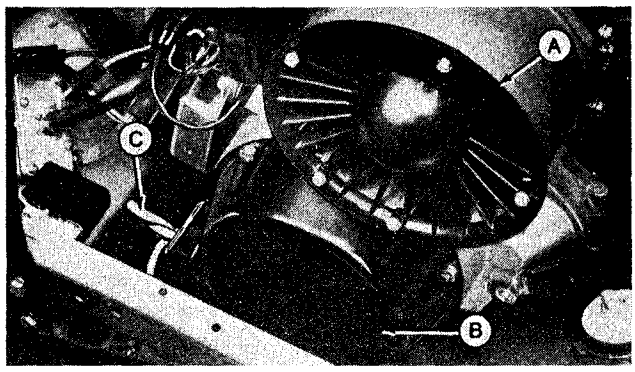
M29272/1197/2015N/211181

23. Install fan cover (A).

24. Install starter (B), handle, untie knot in rope (C).

25. Install oil pump, Trailfire LX (Serial No. 190,001-).

26. Install air intake duct, 340 Trailfire (Serial No. 120,001-), 440 Trailfire, and 440 Trailfire LX.



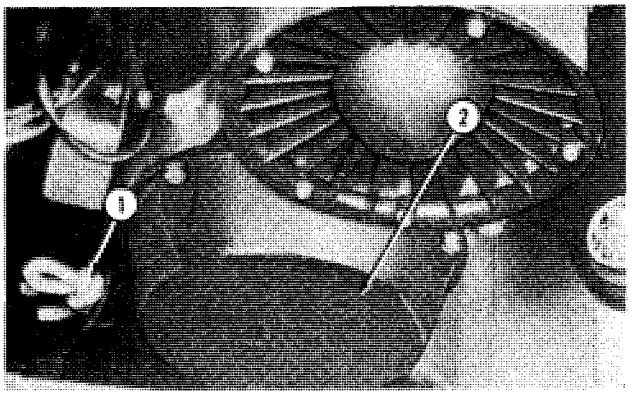
M29273/1197/2015O/211181

REMOVE STARTER

NOTE: On Trailfire LX remove oil pump (Section 30, Group 20).

1. Tie knot in rope, remove handle,

2. Remove starter.



M23532/1197/2020A/211181

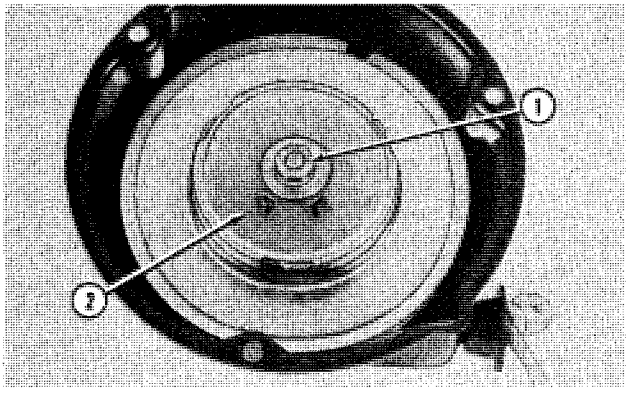
DISASSEMBLE STARTER

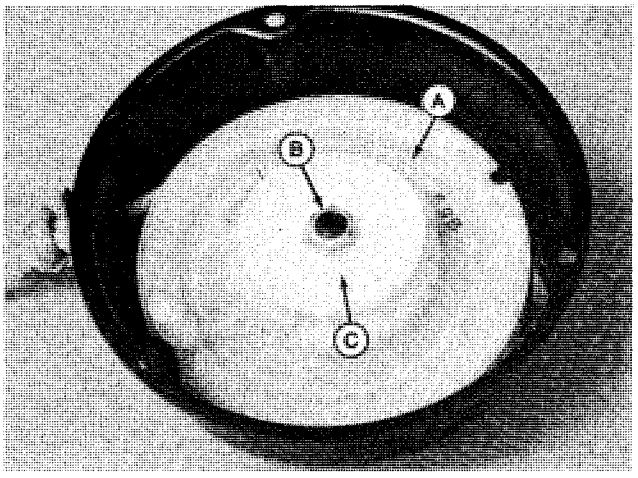
⚠ CAUTION: Recoil starter is under spring pressure. Wear safety glasses, use care.

1. On 340 and 440 Trailfire, press down retainer cover and remove nut, lock washer and large washer.

2. On 340 and 440 Trailfire, slowly lift off cover.

3. On Trailfire LX, hold down pawl cover (A), remove nut (B) and washer cover (C).

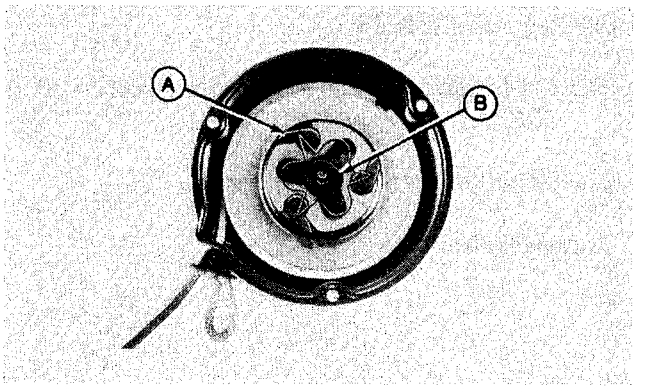




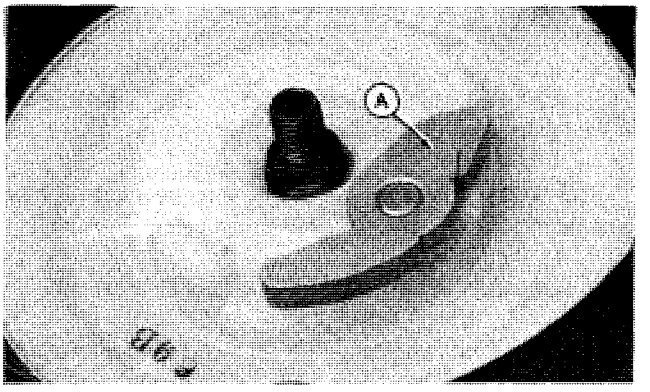
M23533 M29274/1197/2020B/211181

3. On 340 and 440 Trailfire, remove pawls and pawl springs (A).

4. On 340 and 440 Trailfire, remove return spring, center spring and washer (B).



3. On Trailfire LX, remove pawl and spring (A).

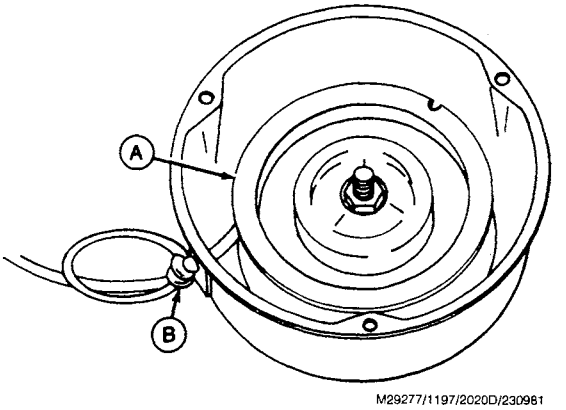


M29275 M29276/1197/2020C/230981

CAUTION: In next step, hold reel (A) to keep it from unwinding too fast.

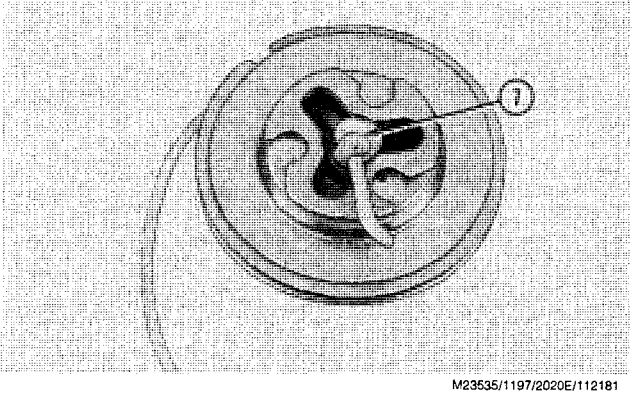
5. Untie knot (B) in rope, let reel unwind slowly.

6. Turn reel back and forth to free spring, slowly remove reel.



M29277/1197/2020D/230981

7. Pull rope from reel.

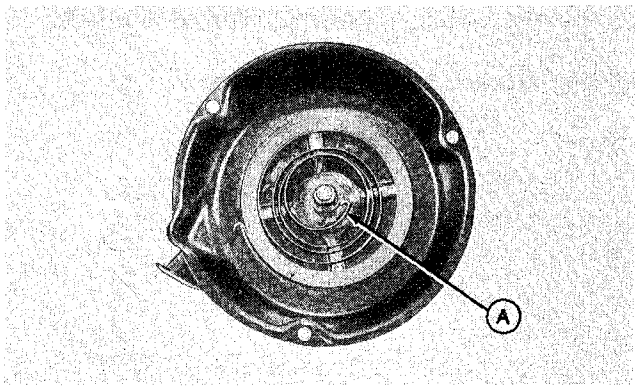


M23535/1197/2020E/112181

8. Inspect recoil spring for damage.

CAUTION: Do not remove unless replacement needed, spring will unwind and may fly out of housing.

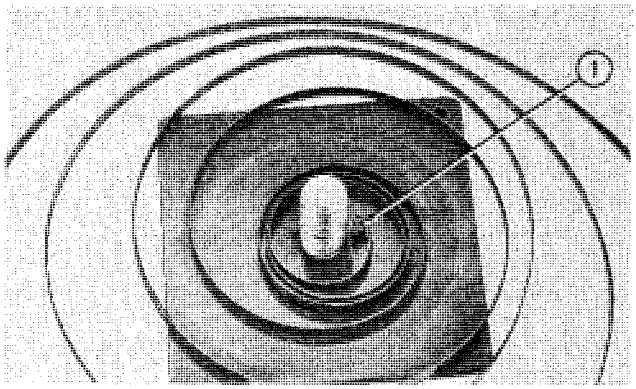
9. Remove spring: wear gloves, contain spring and pry on center of spring (A) with long tool.



M29278/1197/2020F/112181

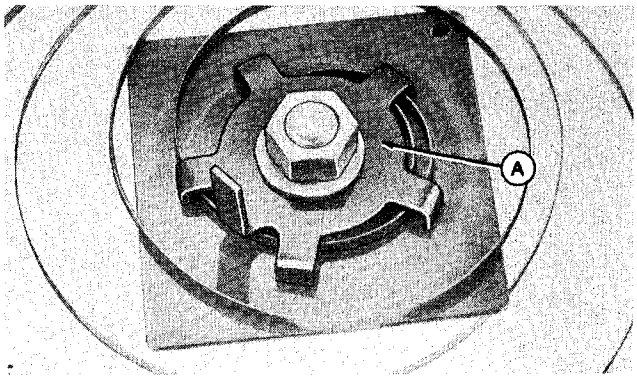
ASSEMBLE STARTER

1. Set recoil spring on JDM-113 Starter Spring winding tool with inner bend hooked on pin.



M23537/1197/2020G/112181

2. Set retainer (A) over spring, install washer and nut.



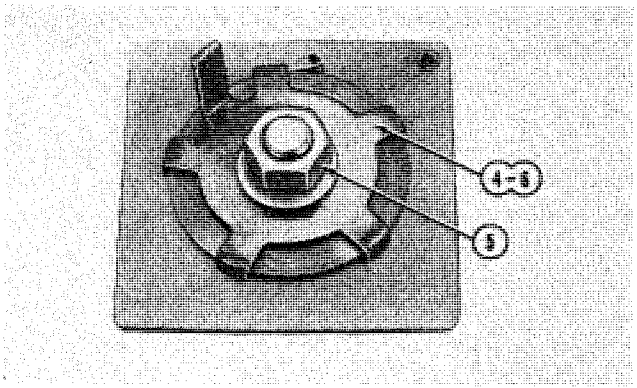
M29279/1197/2020H/112181

3. Wind spring clockwise until it is gathered in retainer.

4. Allow spring to unwind inside retainer.

5. Remove nut and washer.

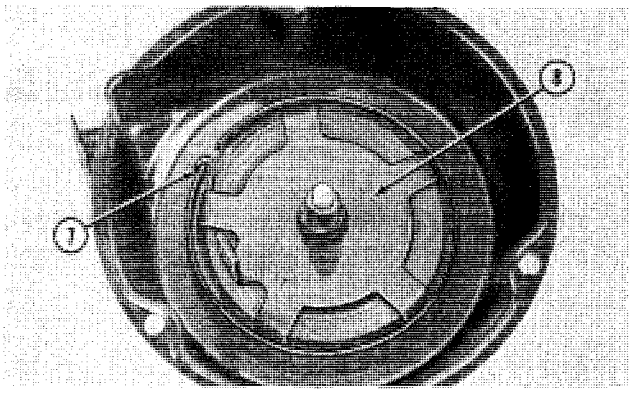
6. Carefully lift retainer (with spring) from plate.



M23539/1197/2020I/112181

7. Set recoil spring in housing, place end in notch.

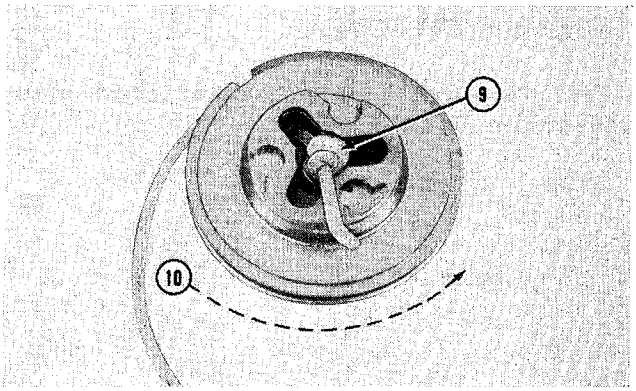
8. Hold spring down, remove retainer.



M23540/1197/2020J/112181

9. Tie knot in one end of rope, guide open end through hole in reel until knot seats.

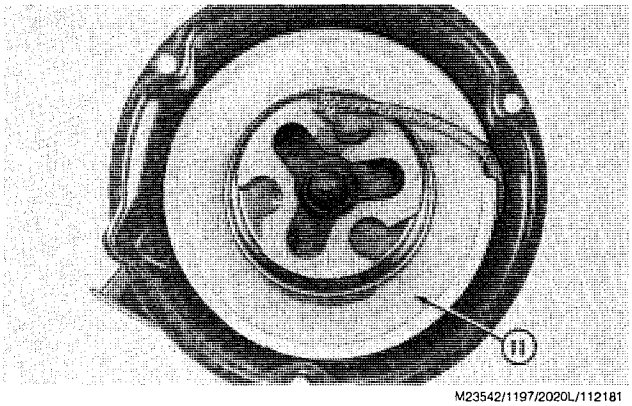
10. Wind rope counterclockwise around reel.



M23541/1197/2020K/112181

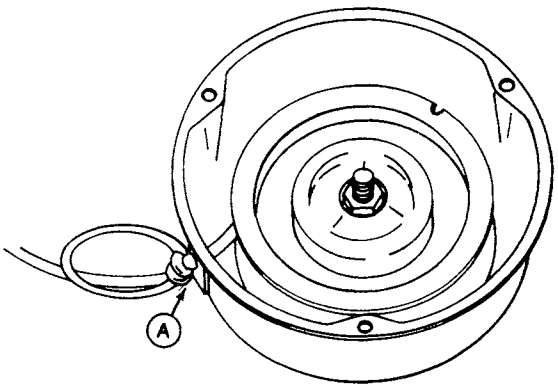
11. Hold end of rope in notch, install reel in housing.

12. Turn reel back and forth until it catches recoil spring and falls into position.



M23542/1197/2020L/112181

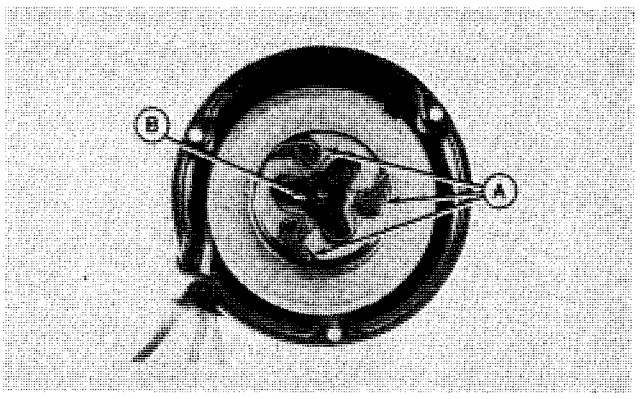
13. Turn reel counterclockwise one turn and hold; guide rope through hole and tie knot (A) to hold rope.



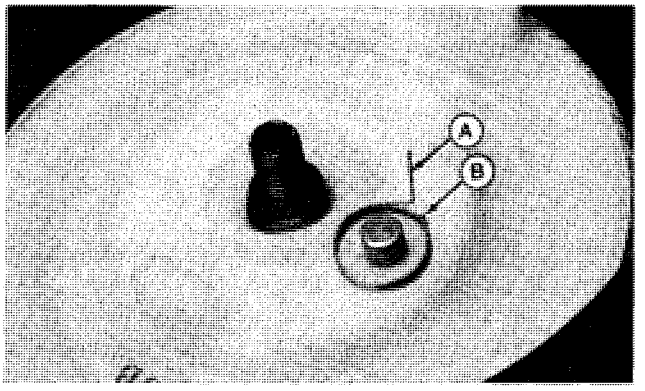
M29295/1197/2020M/230981

14. On 340 and 440 Trailfire place pawls (A) on reel, install pawl springs.

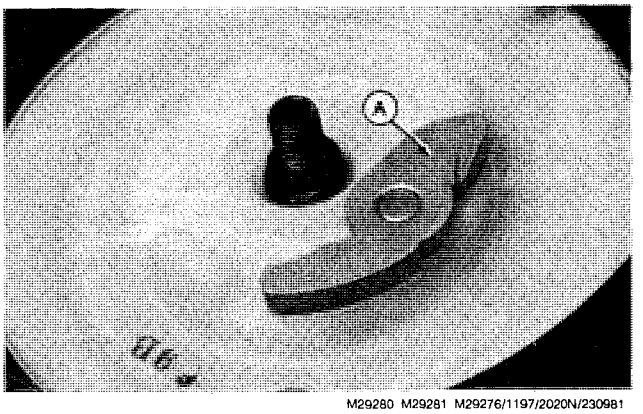
15. On 340 and 440 Trailfire install washer (B) over center post.



14. On Trailfire LX, install pawl spring (A) in groove around steel peg so that long end is in reel (B).



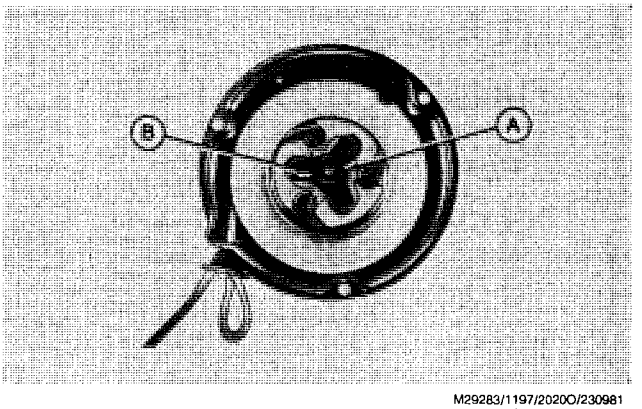
15. On Trailfire LX, fit pawl (A) over spring and peg so that small end of spring hooks in a notch on outside of pawl.



M29280 M29281 M29276/1197/2020N/230981

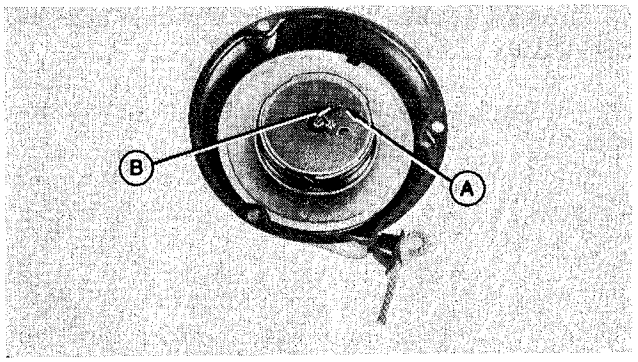
16. On 340 and 440 Trailfire, set center spring (A) over post.

17. On 340 and 440 Trailfire, set return spring over center spring, connect straight end to hole in reel.



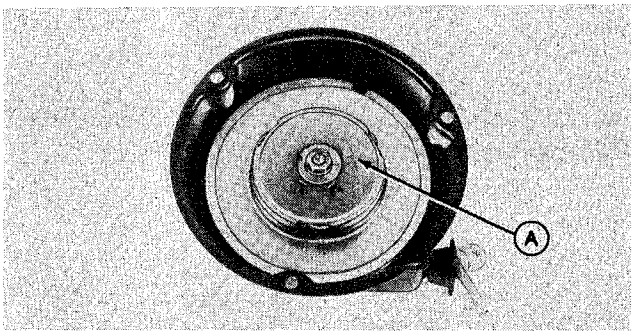
M29283/1197/2020O/230981

18. On 340 and 440 Trailfire, use wire or small screwdriver to align notch (A) in spring cover with curved end of spring (B).



19. On 340 and 400 Trailfire, turn spring cover (A) counterclockwise until notches align with pawls.

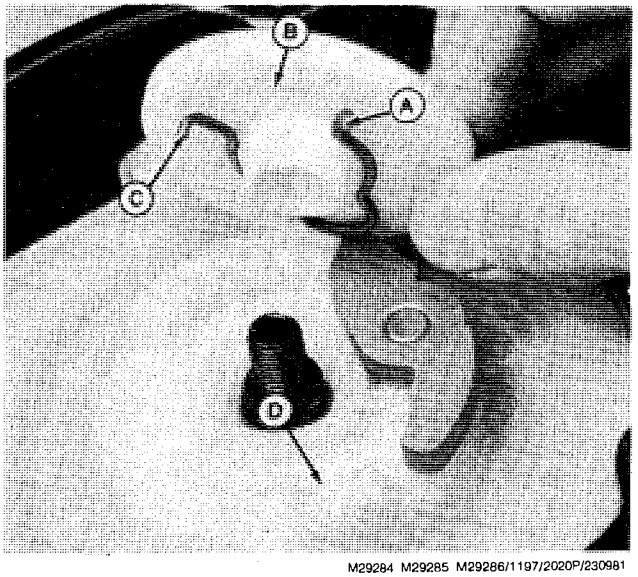
20. On 340 and 400 Trailfire, press down, install flat washer (dimpled side down), lock washer, and nut. Tighten nut.



18. On Trailfire LX, install U-shaped clip (A) around cover (B) so that curved end (C) faces out.

19. On Trailfire LX, install cover so that clip straddles small boss (D) on reel.

20. Install nut and tighten.



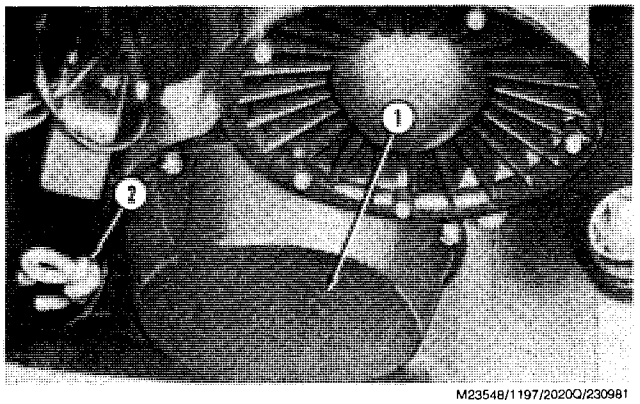
M29284 M29285 M29286/1197/2020P/230981

INSTALL STARTER

1. Install starter.

2. Guide end of rope through guides, install handle, untie knot.

3. On Trailfire LX install oil injection pump (Section 30, Group 20).



M23548/1197/2020Q/230981

340 ENGINE SPECIFICATIONS

Item	New Part Dimension	Wear Tolerance
Cylinder Bore	(60.005 to 60.025 mm) 2.3624 to 2.3632 in.	(0.0939 mm) 0.0037 in.
Connecting Rod Small End	(20.003 to 20.014 mm) 0.7875 to 0.7880 in.	(0.0483 mm) 0.0019 in.
Connecting Rod Side Clearance	(0.4 to 0.5 mm) 0.0157 to 0.0197 in.	(0.3022 mm) 0.0119 in.
Crankshaft Runout	(0.05 mm) 0.002 in.	
Crankshaft End Play	(0.770 mm) 0.030 in.	
Piston at Top Land	(59.681 to 59.700 mm) 2.3496 to 2.3504 in.	
Piston at Skirt	(59.961 to 59.980 mm) 2.3607 to 2.3614 in.	(0.1346 mm) 0.0053 in.
Piston Pin Bore	(15.999 to 16.005 mm) 0.6299 to 0.6301 in.	(0.0813 mm) 0.0032 in.
Piston Pin Diameter	(15.994 to 16.000 mm) 0.6297 to 0.6299 in.	(0.0406 mm) 0.0016 in.
Bottom Ring Groove Clearance	(0.05 to 0.09 mm) 0.002 to 0.0035 in.	(0.1016 mm) 0.0040 in.

1197/2025A/240981

440 AND TRAILFIRE LX ENGINE SPECIFICATIONS

Item	New Part Dimension	Wear Tolerance
Cylinder Bore	(68.005 to 68.025 mm) 2.6774 to 2.6781 in.	(0.0939 mm) 0.0037 in.
Connecting Rod Small End	(20.003 to 20.014 mm) 0.7875 to 0.7880 in.	(0.0483 mm) 0.0019 in.
Connecting Rod Side Clearance	(0.4 to 0.5 mm) 0.0157 to 0.0197 in.	(0.3022 mm) 0.0119 in.
Crankshaft Runout	(0.05 mm) 0.002 in.	
Crankshaft End Play	(0.0770 mm) 0.030 in.	
Piston at Top Land	(67.681 to 67.700 mm) 2.6646 t0 2.6654 in.	
Piston at Skirt	(67.961 to 67.980 mm) 2.6756 to 2.6764 in.	(0.1346 mm) 0.0053 in.
Piston Pin Bore	(15.999 to 16.005 mm) 0.6299 to 0.6301 in.	(0.0813 mm) 0.0032 in.
Piston Pin Diameter	(15.994 to 16.000 mm) 0.6297 to 0.6299 in.	(0.0406 mm) 0.0016 in.
Bottom Ring Groove Clearance	(0.05 to 0.09 mm) 0.002 to 0.0035 in.	(0.1016 mm) 0.0040 in.

SPARK PLUG SPECIFICATION

Champion QN-3. (AM53941)

1197/2025B/300981

TORQUE SPECIFICATIONS

Location	Torque
Crankcase	(22 N·m) 16 ft-lbs
Cylinder-to-Crankcase	(22 N·m) 16 ft-lbs
Cylinder Head	(22 N·m) 16 ft-lbs
Intake Manifold	(5.8-7.8 N·m) 4.3-5.8 ft-lbs
Flywheel to Crankshaft	(81 N·m) 60 ft-lbs
Fan Pulley Nut	(64 N·m) 47 ft-lbs
Spark Plug	(27 N·m) 20 ft-lbs
Carburetor Rubber Flange	(4.7 N·m) 3.5 ft-lbs
Engine Mount Bolts	(54 N·m) 40 ft-lbs
Exhaust Manifold	(18-22 N·m) 13-16 ft-lbs

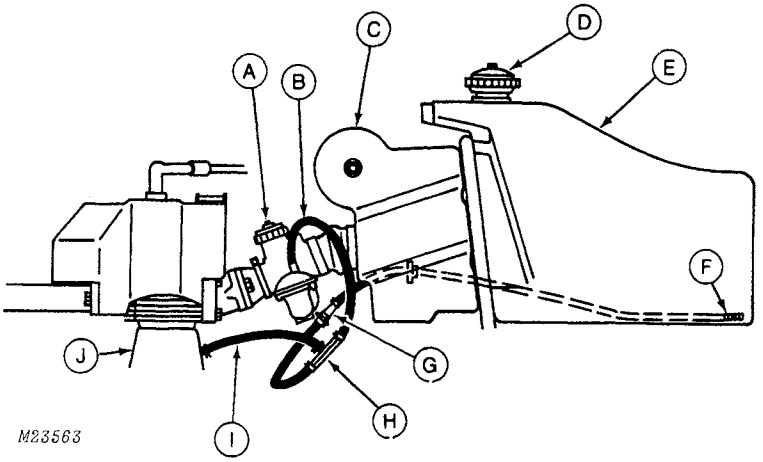
1197/2025C/300981

Section 30
FUEL SYSTEM

CONTENTS

1197/30051/240981

PRINCIPLE OF OPERATION
(340 and 440 Trailfire)



A—Carburetor
B—Fuel Pump-To-Carburetor Line
C—Intake Silencer
D—Fuel Cap
E—Fuel Tank
F—Screen
G—In-Line Fuel Filter
H—Fuel Pump
I —Impulse Line
J —Engine Crankcase

The fuel system consists of the fuel tank (E), impulse line (I), in-line fuel filter (G), fuel pump (H) and carburetor (A). The fuel tank has a capacity of (28.3 L) 7.5 U.S. gallons. The fuel pickup line in the tank has a self-cleaning screen (F) with a ball-type check valve.

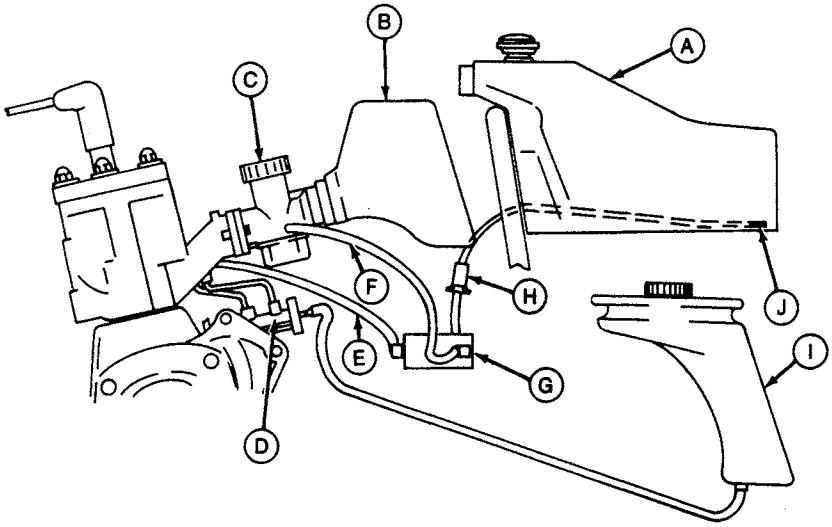
The nylon screen in the in-line fuel filter (G) has a self-cleaning action. Pulsation of the screen shakes loose contamination which collects at the base of the cone.

Regular leaded or non-leaded gasoline with an anti-knock index of 88 or higher must be mixed with 2-cycle oil. The oil must be BIA certified oil. Gasoline and oil mixing is improved if the oil is at room temperature. The correct fuel-oil mixture is 50:1 ratio.

NOTE: Regular (leaded) gasoline is preferred but non-leaded gasoline is acceptable.

M23563/1197/3005A/240981

PRINCIPLE OF OPERATION
(Trailfire LX)



M25329

A—Fuel Tank
B—Air Intake Silencer
C—Carburetor
D—Oil Injection Pump
E—Impulse Line
F—Fuel Line to Carburetor
G—Fuel Pump
H—In-Line Fuel Filter
I —Oil Tank
J —Screen

The fuel system consists of the fuel tank (A), air intake silencer (B), oil tank (I), impulse line (E), in-line fuel filter (H), fuel pump (G), oil injection pump (D), and carburetor (C). The fuel tank has a capacity of (28.3 L) 7.5 U.S. gallons. The oil tank has a capacity of (1.7 L) 3.5 U.S. pints. The fuel pick-up line in the tank has a self-cleaning screen (J) with a ball-type check valve.

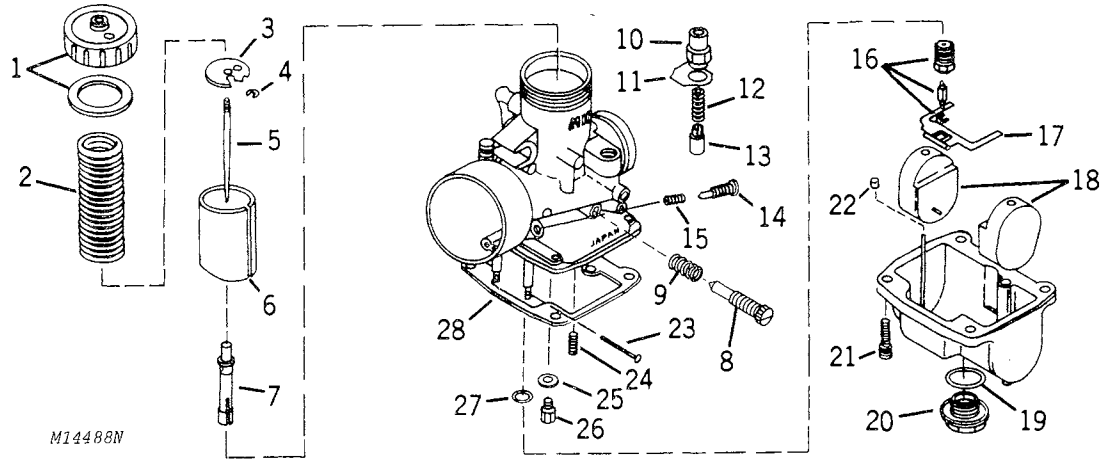
The nylon screen in the in-line fuel filter (H) has a pulsating, self-cleaning action to shake loose contamination, which collects at the base of the cone.

Regular leaded or non-leaded gasoline with an anti-knock index of 88 or higher must be used. The oil must be BIA certified oil.

NOTE: Regular (leaded) gasoline is preferred but non-leaded gasoline is acceptable.

M25329/1197/3005B/240981

CARBURETOR



1—Mixing Chamber Top
2—Throttle Valve Spring
3—Plate
4—E-Ring
5—Jet Needle
6—Throttle Valve
7—Needle Jet
8—Throttle Stop Screw
9—Throttle Stop Spring
10—Starter Valve Cap
11—Washer
12—Starter Valve Spring
13—Starter Valve
14—Pilot Air Screw
15—Air Screw Spring
16—Needle Valve
17—Float Arm
18—Float
19—O-Ring
20—Drain Screw
21—Machine Screw
22—Cap
23—Float Arm Pin
24—Pilot Jet
25—Washer
26—Main Jet
27—Washer
28—Gasket

The Mikuni Carburetor is a twin-float, fixed-jet, throttle-valve carburetor. It consists of four systems; the choke, float, pilot and main systems.

M14488/1197/3005C/160981

CHOKE SYSTEM

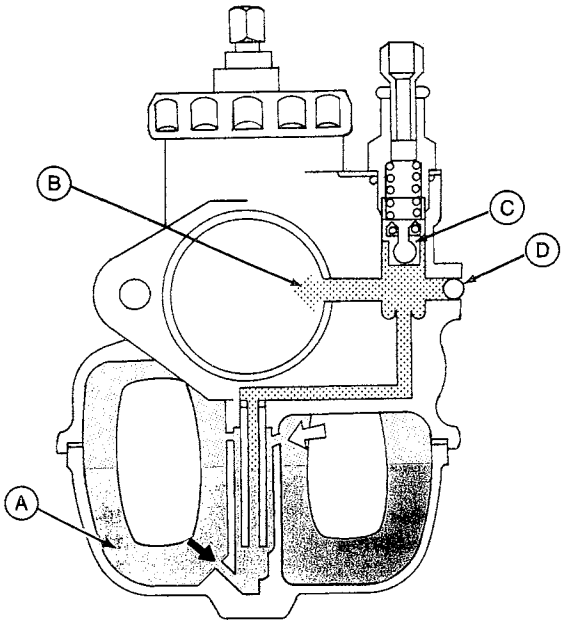
The choke system consists of the starter jet and choke plunger (C). This system eliminates the need for a choke in the carburetor bore, thereby increasing efficiency and providing easier starting.

NOTE: The throttle valve must be closed for starting. The choke system requires negative pressure in the inlet pipe in order to function.

The system is opened and closed by the choke plunger (C). Moving the choke lever on the right-hand panel up lifts the choke plunger and opens the choke system.

Fuel (A) is metered through the starter jet and mixed with air (D) in the emulsion tube. This mixture flows into the plunger area, mixes with more air from the air intake (D) and is then drawn into the engine through the carburetor throat.

A—Fuel
B—Fuel-Aix Mixture
C—Choke Plunger
D—Air



M18208/1197/3005D/240981

FLOAT SYSTEM

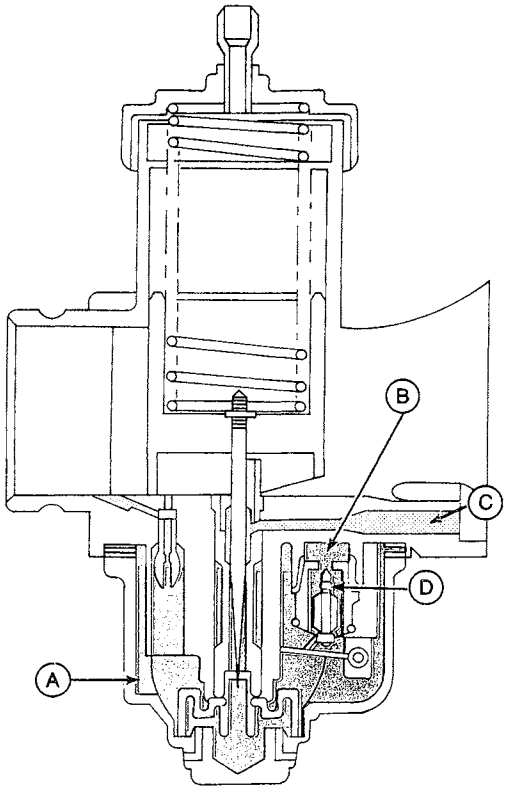
The float system consists of two independent floats and a needle valve. The system maintains fuel at a constant level in the float chamber.

A fuel level drop in the float chamber causes the floats and float arm to drop. Fuel under pressure from the fuel pump is forced around the needle valve (D) and into the float chamber.

As fuel in the float chamber approaches the correct level, the floats raise contacting the float arm. The float arm moves the needle valve against the valve seat, stopping fuel flow into the float chamber.

Under operating conditions, the fuel level and floats position themselves so that inward flow of fuel to the carburetor is equal to the outward flow of fuel to the engine.

A—Fuel
B—Fuel Inlet
C—Air
D—Needle Valve



M18209/1197/3005E/240981

PILOT SYSTEM (IDLE AND SLOW SPEED)

The pilot system consists of the pilot jet, air screw, pilot outlet and bypass. The ratio of fuel-air mixture for idling and slow speed is controlled by the pilot jet and air screw.

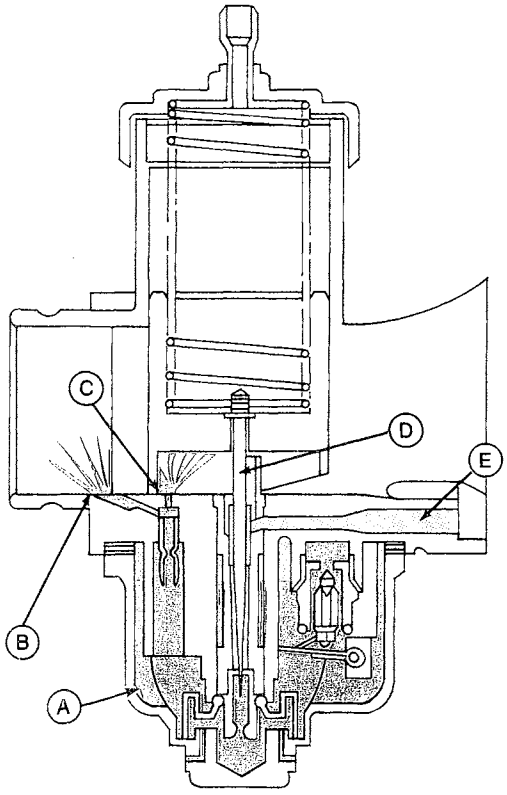
The system controls the fuel-air mixture from idle or closed throttle position until the throttle valve is opened sufficiently to allow the main system to function.

At idle speed the throttle valve is closed and the air velocity through the needle jet is low. This low pressure is not enough to draw fuel from the needle jet of the main system.

Fuel during idle is supplied by the pilot outlet (C) and bypass (B). Fuel metered by the pilot is mixed with air (E) from the air intake and bypass before the fuel enters the carburetor bore.

As the throttle valve is opened wider for low-speed operation, the pilot outlet (C) cannot supply the required fuel. The fuel then enters the carburetor bore through the bypass (B) as well as the pilot outlet (C).

A—Fuel
B—Pilot Bypass
C—Pilot Outlet
D—Jet Needle
E—Air



M18210/1197/3005F/240981

MAIN SYSTEM

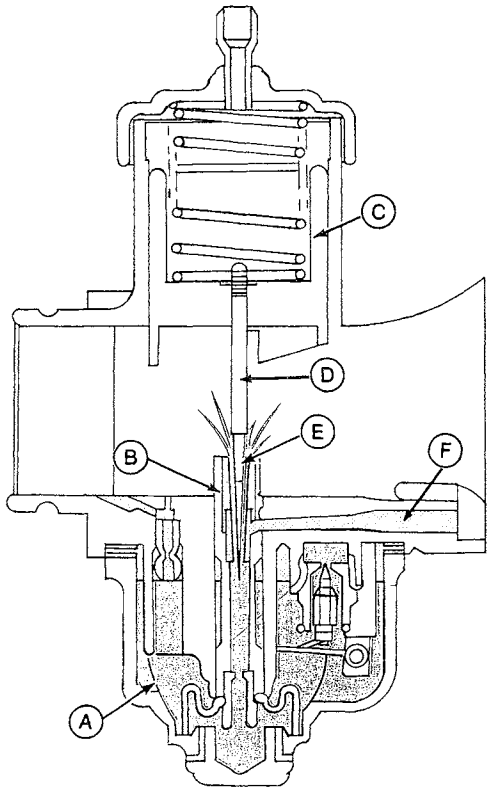
The main system, starts to function when the throttle valve (C) is opened about 1/4 of the way. Opening the throttle valve causes the jet needle (D) to move up. This increases air flow through the needle jet (B), thereby increasing negative pressure which causes a sucking action to take place.

From 1/4 to 3/4 open throttle, the fuel passes through the main jet and is metered in the clearance between the needle jet (B) and jet needle (D). The fuel is then mixed with air that is metered (E) through the air intake, thereby atomizing the fuel. This mixture is then mixed with air flowing through the main bore before entering the engine.

During this operation the cutaway (slant) of the throttle valve (C) controls the negative pressure on the needle jet (B), thereby regulating the amount of fuel that is injected into the engine.

When the throttle valve is fully opened for high speed operation, fuel is metered entirely by the main jet.

A—Fuel
B—Needle Jet
C—Throttle Valve
D—Jet Needle
E—Metered Here
F—Air



M18211/1197/3005G/240981

DIAGNOSE MALFUNCTIONS

CARBURETOR TOO RICH

Float level incorrect.
Dirt under inlet needle valve.
Silencer restricted.
Wrong main jet.
Choke system adjusted incorrectly.
Jet needle clip positioned incorrectly.
Air jet restricted.

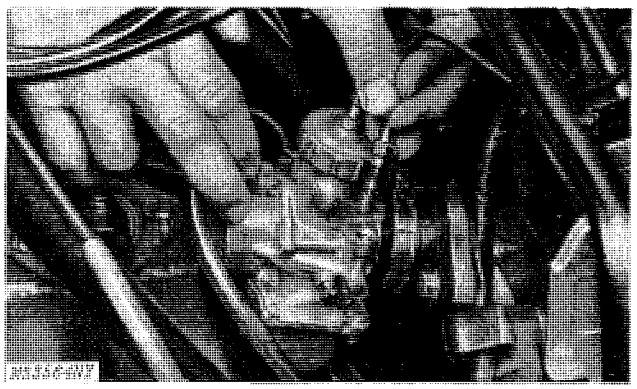
CARBURETOR TOO LEAN

In-line fuel filter plugged or restricted.
Dirty fuel pickup strainer in fuel tank.
Fuel pump impulse line plugged.
Hole in fuel impulse line.
Jet needle clip positioned incorrectly.
Wrong main jet.
Faulty fuel pump.
Pinched fuel lines.
Hole in intake silencer boot.
Head gasket leaking.
Operating with air intake silencer removed.
Air leakage at intake manifold gaskets.
Air leakage at crankshaft seals or crankcase mating surfaces.
Inlet needle valve restricted.

1197/3005H/240981

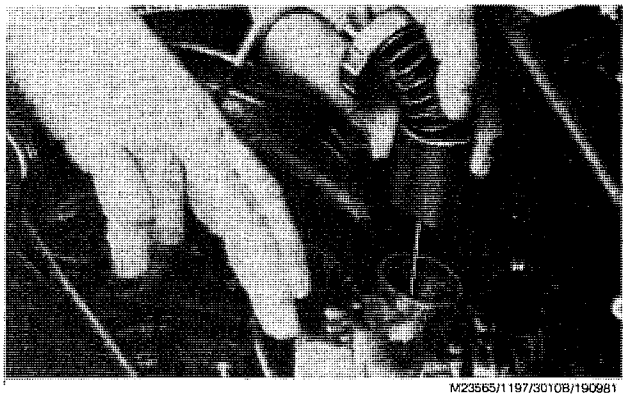
REMOVE CARBURETOR

1. Remove air silencer.
2. Disconnect fuel line from carburetor.
3. Remove choke plunger assembly.



M23564/1197/3010A/190981

4. Remove throttle valve assembly.
5. Remove carburetor.

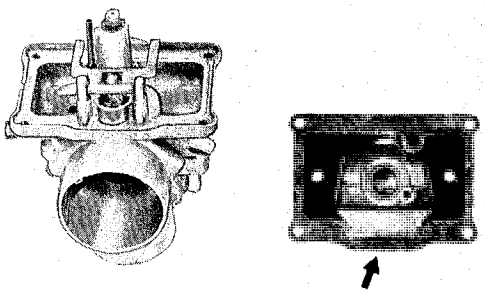


M23565/1197/3010B/190981

DISASSEMBLE CARBURETOR

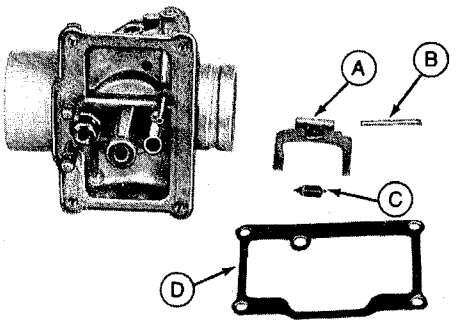
CAUTION: Drain fuel with care. Avoid fires due to smoking or carelessness.

1. Drain fuel from float chamber.
2. Remove throttle stop screw and air screw.
3. Remove float chamber.
4. Remove main jet with a 6 mm socket.



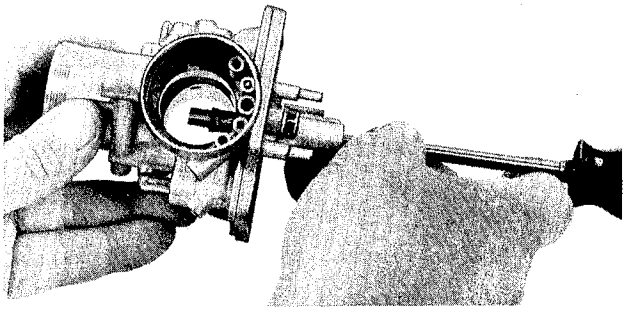
M22681/1197/3010C/190981

5. Remove float arm pin (B), float arm (A), inlet needle valve (C), and gasket (D).



M22682/1197/3010D/190981

6. Remove needle jet - push from bottom with an awl.



M22683/1197/3010E/190981

INSPECT AND REPAIR CARBURETOR

IMPORTANT: Never clean jets or passages with small drills or wire. Replace jets if varnished.

1. Place carburetor parts except gaskets in PT503 Cleaner or equivalent for 1 to 2 hours.

2. Rinse parts in solvent.

IMPORTANT: Do not use rags or paper to dry parts - lint may plug jets, passages.

3. Dry parts with compressed air, be sure all holes are open.

4. Rinse mixing chamber body and float chamber in hot water to stop cleaner action on aluminum.

5. Check mixing chamber body, float chamber for cracks or damage.

6. Check all springs for damage or distortion.

7. Check throttle stop screw, set screw for damage to seating surface or stripped threads.

8. Check main, pilot jets for damage or stripped threads.

NOTE: Jets must be clean, shiny. Abrasives cause lean fuel-air mixture, possible engine damage.

9. Remove retainer and inlet valve, check seat and seat surface of valve for damage.

NOTE: Make sure retainer does not hinder motion of inlet valve.

10. Check jet and needle for damage; needle should slide freely.

11. Install float, move up and down - they should not bind on guides.

12. Check that float arm does not bind on pin.

13. Check that choke plunger moves freely.

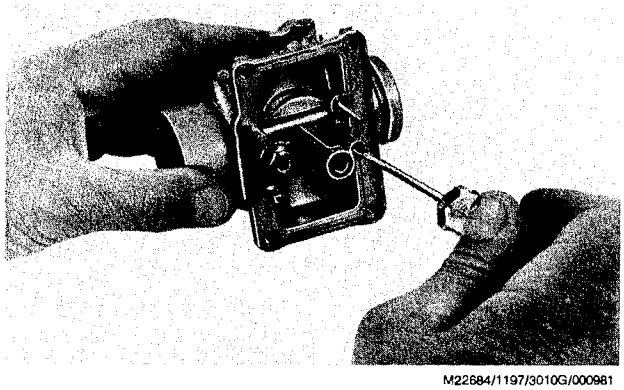
14. Install throttle valve, check for sticking.

15. Check that guide pin is not broken - this allows throttle valve to turn causing erratic engine operation.

1197/3010F/190981

ASSEMBLE CARBURETOR

1. Install and tighten pilot jet.

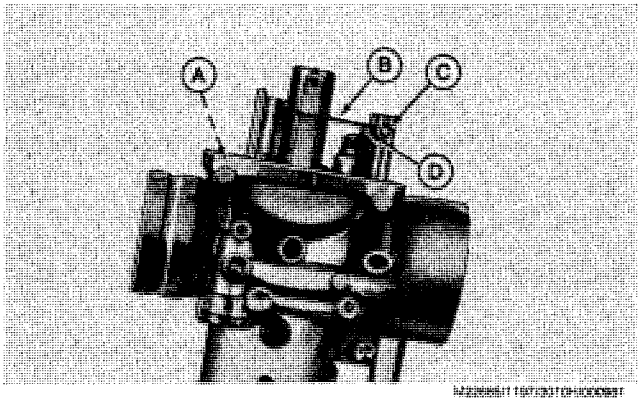


M22684/1197/3010G/000981

2. Install gasket (A).

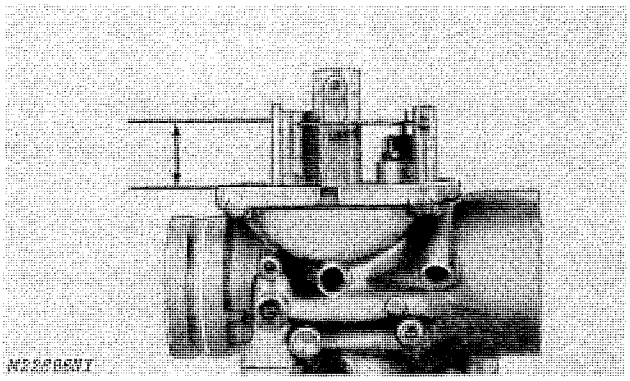
3. Install new washer on valve seat and install seat. Install inlet needle valve (D) with point down.

4. Install float arm (B) and secure with float arm pin (C).



5. With carburetor inverted, the edge of the body should be parallel with the float arm.

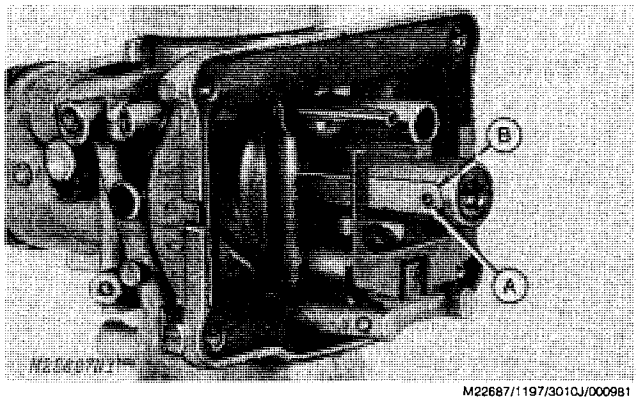
6. If adjustment is necessary, bend only the actuating tab, not the float arm.



M22686/1197/3010I/000981

7. Install needle jet with notch of needle jet (B) aligned with pin in bore (A).

8. Install main jet.



M22687/1197/3010J/000981

9. Install floats with pins on floats down and to inside of float chamber.

10. Install float chamber on mixing chamber body.

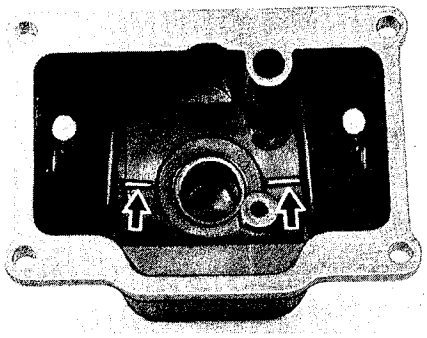
11. Install air screw spring and air screw.

12. Turn air screw in until it just seats. DO NOT force it.

13. Back air screw out 2 turns.

14. Install throttle stop screw spring and stop screw.

15. Turn throttle stop screw in until it is just flush with inside of the bore.



M22688NY

M22688/1197/3010K/000981

INSTALL CARBURETOR

1. Position carburetor in rubber mount and secure with clamp.

2. Connect fuel line to carburetor.

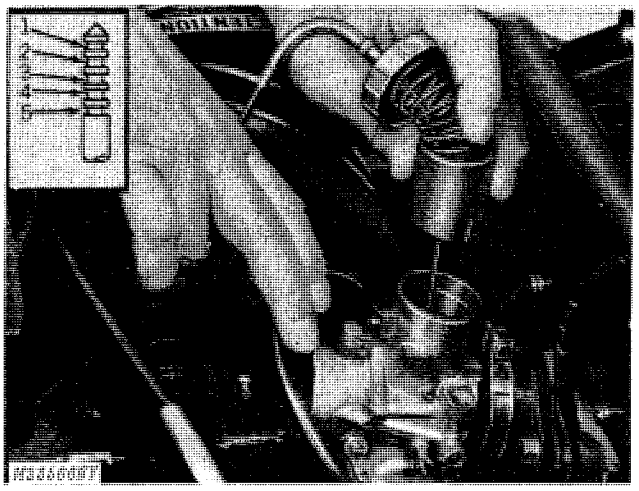
3. Install plastic washer and E-ring in correct groove of jet needle, (inset in Fig.). Plastic washer goes between E-ring and throttle valve. See Section 30, Group 10 for E-ring position.

NOTE: Groove No. 1 provides lean midrange operation; groove No. 5 provides rich midrange operation.

4. Guide throttle cable through cap, spring and slot in throttle valve. Slide cable end into narrow part of slot in throttle valve.

5. Install plate between spring and throttle valve with tab on plate in slot of throttle valve. This locks cable to the throttle valve.

6. Compress throttle valve spring and tighten cap to body.

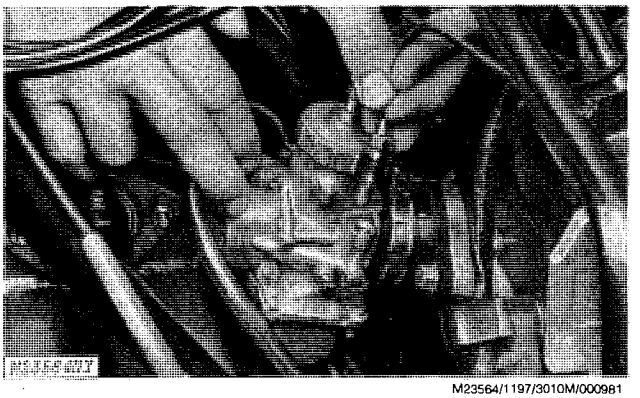


M23566/1197/3010L/000981

7. Be sure choke lever is down.

8. Guide choke cable through cap and spring. Hook end button in choke plunger.

9. Place washer on carburetor body. Install the assembly and tighten cap.



M23564/1197/3010M/000981

10. Remove air intake silencer.

11. Place choke lever down (closed).

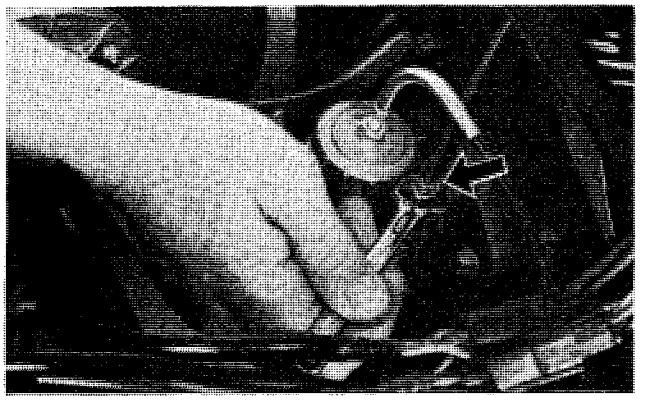
12. Look in choke plunger hole in carburetor throat.

NOTE: Plunger should be all the way down in bore and there should be slight freeplay between choke lever and dash.

13. To adjust plunger, loosen jam nut and turn adjusting sleeve clockwise. This moves plunger down. Tighten jam nut.

IMPORTANT: Plunger must be down tight in bore or the carburetor will run "rich". This will affect engine performance.

14. Raise choke lever and look in choke plunger hole. Plunger should raise enough to expose at least half the hole opening.



M23306/1197/3010N/000981

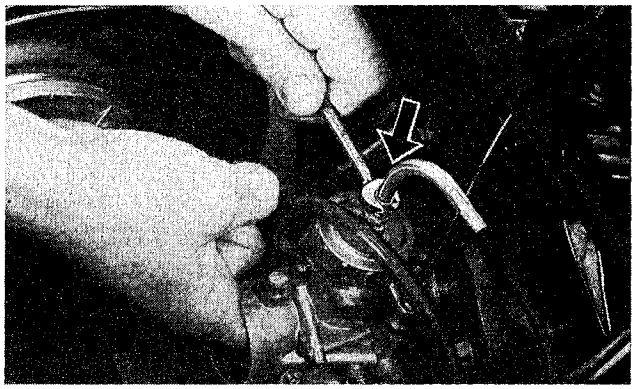
15. Remove air intake silencer.

16. Lock throttle lever against handgrip with a clamp or strong rubber band.

17. Place your finger in throat of carburetor so you can feel the backside of the throttle valve.

18. Loosen jam nut and turn adjusting sleeve until the backside of throttle valve is flush with the bore. Tighten jam nut.

NOTE: No part of the throttle valve should restrict air flow through the carburetor throat when throttle is in the wide open position. Use Never-Seez on the throttle cable end in the throttle lever.



M23307/1197/3010O/160981

19. Turn idle adjusting screw (B) counterclockwise until the tip is flush with inside of bore.

20. Remove clamp or rubber band from throttle lever. This allows throttle valve to fully seat in bore.

21. Turn idle adjusting screw (B) clockwise until screw contacts throttle valve. Turn screw clockwise two additional turns. This gives preliminary idle speed.

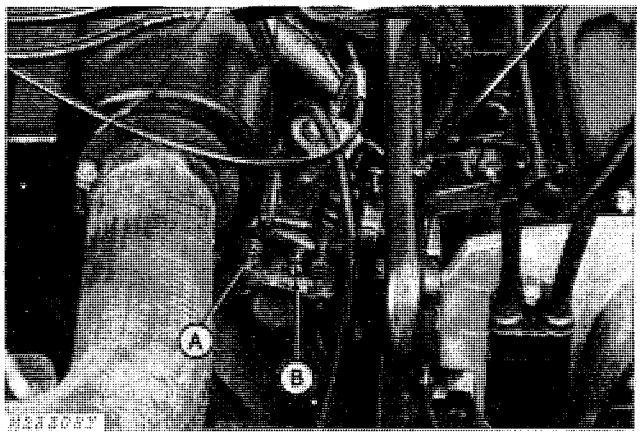
22. Look into throat of carburetor and slowly compress throttle lever. The throttle valve should begin to rise; if not, repeat Steps 16, 17, 18.

23. Turn air screw (A) in until slight seating resistance is felt.

24. Back air screw (A) out one and a half turns.

25. Install air intake silencer and run engine until operating temperature is reached. If idle speed is not correct, turn idle adjusting screw (B) in or out until idle speed is correct.

IMPORTANT: NEVER use air screw (A) to set engine idle. Adjust air screw as explained in Step 24.



M23308/1197/3010P/000981

ALTITUDE CHART

340 Trailfire Snowmobile

Temperature	Altitude	Sea Level to (0 to 1 219 m) 4000 Ft.	(1 219 to 1 828 m) 4000 Ft. to 6000 Ft.	Above (1 828 m) 6000 Ft.
Below (−18°C) 0°F	Main Jet	200	190	170
Above (−18°C) 0°F	Main Jet	190*	180	160
ALL TEMPERATURES	Jet Needle	6F27-3**	6F27-3**	6F27-3**
	Needle Jet	O-6 (166)	O-6 (166)	O-6 (166)
	Throttle Valve	3.0	3.0	3.0
	Pilot Jet	30	30	30
	Air Screw (Turns Open)	1-1/2 Open	1-1/2 Open	1-1/2 Open
	Idle Speed (rpm)	1800-2300	2000-2500	2000-2500

* *Factory Installed*

** *Example 6F27-3 or 6FL14-4. The last number (3 or 4) indicates E-ring position on the jet needle, that is 3rd or 4th groove down from the top.*

1197/3010Q/000981

ALTITUDE CHART

440 Trailfire and Trailfire LX Snowmobile

Temperature	Altitude	Sea Level to (0 to 1 219 m) 4000 Ft.	(1 219 to 1 828 m) 4000 Ft. to 6000 Ft.	Above (1 828 m) 6000 Ft.
Below (−18°C) 0°F	Main Jet	240	230	210
Above (−18°C) 0°F	Main Jet	230*	220	200
ALL TEMPERATURES	Jet Needle	6F27-3**	6F27-3**	6F27-3**
	Needle Jet	Q-O (166)	Q-O (166)	Q-O (166)
	Throttle Valve	3.5	3.5	3.5
	Pilot Jet	25	25	25
	Air Screw (Turns Open)	1 Open	1 Open	1 Open
	Idle Speed (rpm)	1800-2300	2700-3200	2700-3200

* *Factory Installed*

** *The last number (3) indicates E-ring position on the needle jet, that is, 3rd groove down from the top.*

1197/3010R/000981

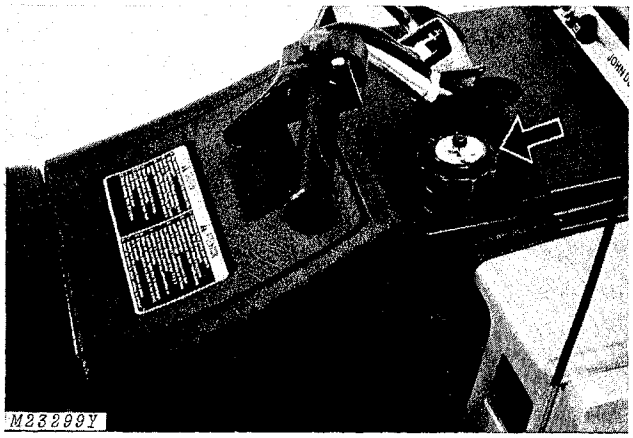
FUEL PUMP, FUEL TANK, SCREEN AND IN-LINE FUEL FILTER

GENERAL INFORMATION

The fuel tank has a capacity of (28.3 L) 7.5 U.S. gallons. The tank is vented by a hole in the cap.

The fuel pickup line in the tank is connected to a screen. The in-line fuel filter is located in the fuel line between the tank and fuel pump.

The in-line fuel filter contains a nylon screen with a self-cleaning action. Pulsation of the screen shakes loose contamination which settles at the base of the filter cone.



M23299/1197/3015A/240981

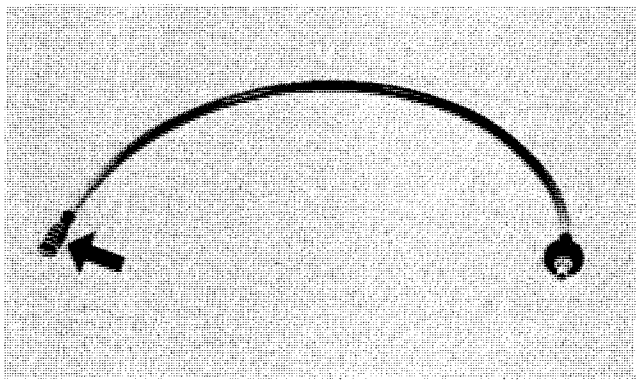
SERVICE SCREEN

1. Disconnect fuel line to fuel pump from fitting and remove fitting with pickup line from tank.

2. Remove pickup screen from end of line.

3. Clean screen with solvent and compressed air. Replace screen if it is damaged.

4. Replace gasket on fuel line fitting.



M22694/1197/3015B/240981

SERVICE FUEL TANK AND IN-LINE FILTER

1. Disconnect fuel line. Remove seat and tank hold-down clips. Slide tank rearward to remove.

2. If tank is damaged, replace it.

3. Tank can be cleaned with solvent and compressed air.

4. Change the filter annually or when contamination starts to build up at the base of the cone.

1197/3015C/240981

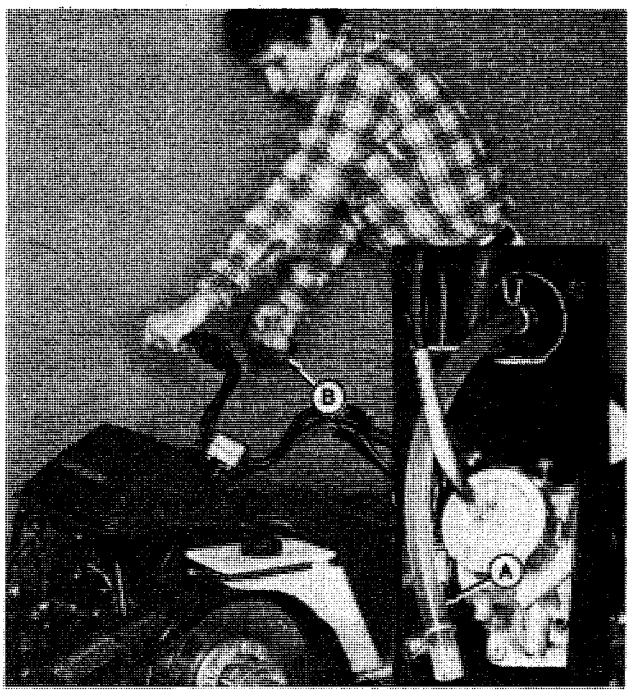
CHECK FUEL PUMP

1. The fuel pump is non-serviceable.

2. Remove fuel line from pump to carburetor at carburetor (A).

3. With ignition off, pull recoil start handle (B) and check for fuel flow from the line.

4. If fuel flows from line, pump is satisfactory; if not, disassemble pump and check diaphragm. Clean the pump and be sure diaphragm is not cracked or wrinkled. If pump does not function after cleaning, replace it.



M29287/1197/3015D/240981

SET UP TO TEST OIL INJECTION PUMP

1. Remove air intake silencer.

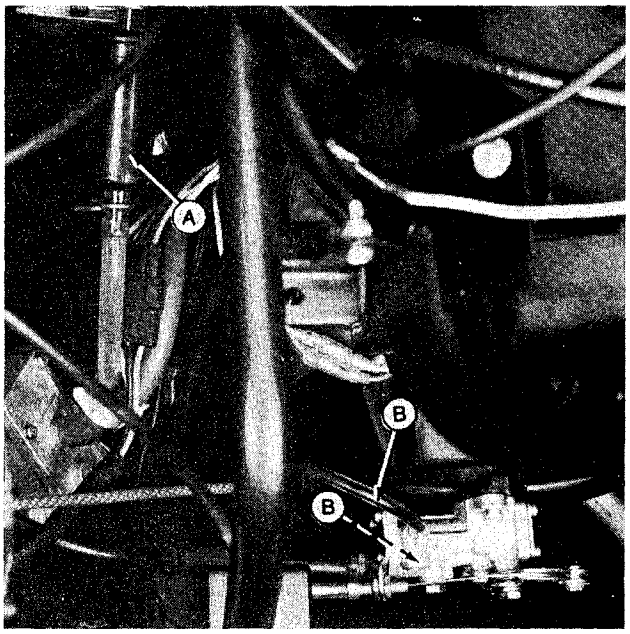
2. Disconnect the in-line fuel filter (A) from the fuel tank line. Plug fuel tank line.

⚠ CAUTION: Use care when disconnecting in-line filter. Avoid fires due to smoking or careless maintenance practices.

3. Connect auxiliary fuel tank (with 50:1 pre-mix fuel) to the in-line filter.

4. Disconnect oil pump output lines (B) at pump.

5. Install separate oil lines to each outlet and place end of each in a separate container.



M29288/1197/3020A/000981

TEST OIL INJECTION PUMP

6. Start and run engine at 3000 rpm.

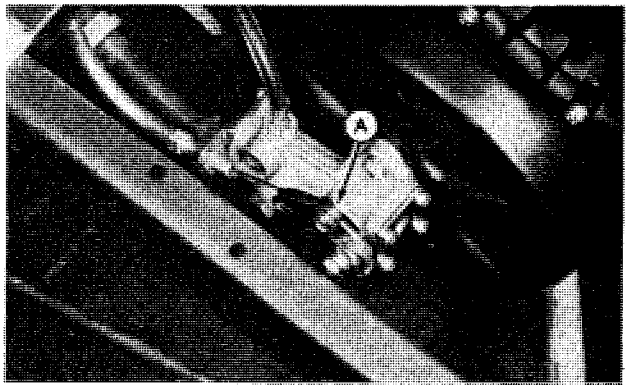
7. Hold the pump lever in the rear WIDE OPEN POSITION (A). Measure the output of each port in a calibrated glass tube. Correct output from each port to the intake manifold fittings should be 1.50 to 1.83 cc per minute. Replace pump if output is below these specifications.

8. Shut-off engine.

9. Connect lines to pump discharge ports.

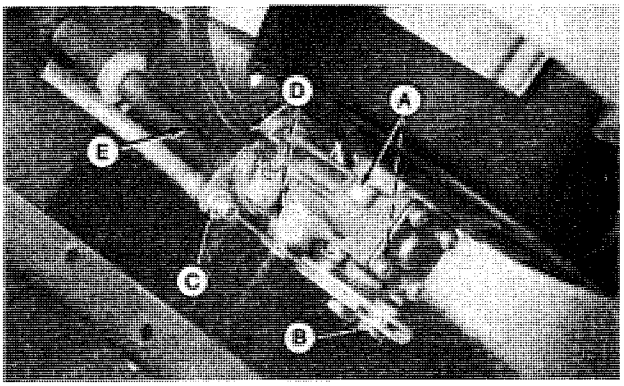
10. Remove auxiliary tank and connect in-line filter.

11. Install air intake silencer.



M29289/1197/3020B/000981

REMOVE OIL INJECTION PUMP



NOTE: Pump is not serviced.

1. Remove screws (A) that hold pump to starter housing.

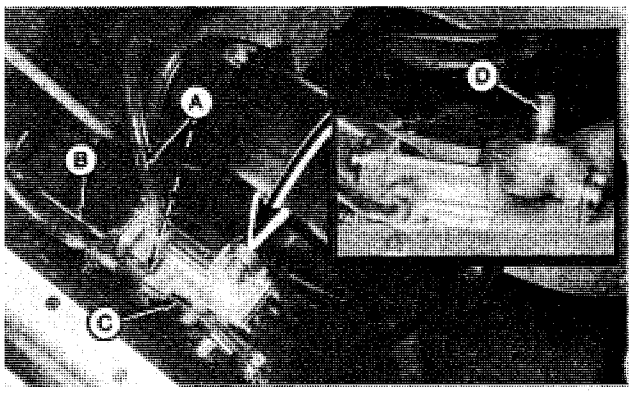
2. Disconnect cable - remove cable end (B) from slot in lever; loosen front adjusting screw (C), slide threaded cable sheath back and pull cable out of bracket.

3. Disconnect oil output lines (D) and oil line (E) from tank.

A—Mounting Screws
B—Cable End
C—Front Adjusting Screw
D—Oil Output Lines
E—Oil Line (Tank)

M29290/1197/3020C/000981

INSTALL OIL INJECTION PUMP



1. Connect oil output lines (A) and oil line (B) to tank.

2. Connect cable (C) - place cable into bracket, slide threaded sheath forward into bracket, hand tighten front adjusting screw; place cable end in lever.

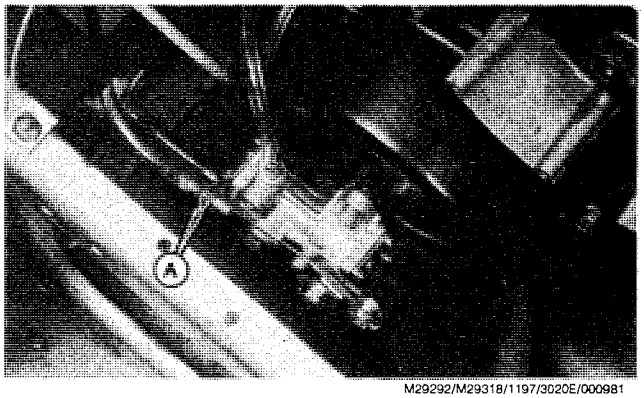
3. Install pump flush to starter housing - make sure square part on pump fits over drive shaft (D).

A—Output Lines
B—Oil Line
C—Cable
D—Drive Shaft

M29291/1197/3020D/000981

ADJUST OIL INJECTION PUMP

1. Adjust cable (if necessary), move jam nuts (A) so that oil pump lever moves at the same time as throttle slide, and so that marks (B) line up when throttle is closed.



M29292/M29318/1197/3020E/000981

BLEED PUMP AND LINES

IMPORTANT: Fill oil tank with BIA approved 2-cycle oil before bleeding pump.

1. Remove air intake silencer.

2. Remove bleed screw (A).

3. Hold control lever (B) in the full open position until all air is deleted from the oil line feeding the pump. Install bleed screw.

4. Connect an auxiliary fuel tank (with 50:1 premix fuel) to the in-line fuel filter.

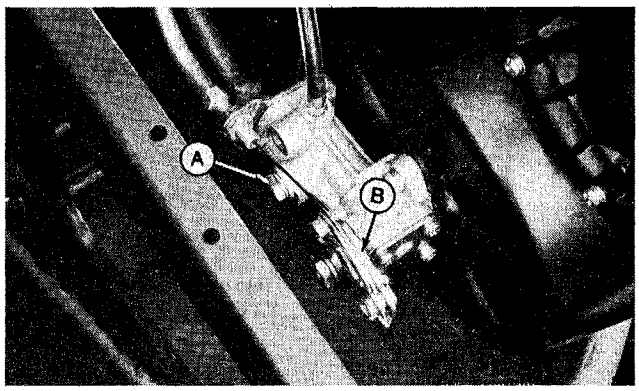
5. Start and run engine at idle speed.

6. Hold the oil pump control lever in the full open position until both discharge oil lines are free of air bubbles.

7. Stop engine and install air intake silencer.

8. Remove auxiliary fuel tank.

9. Refill oil tank.



M29293/1197/3020F/000981

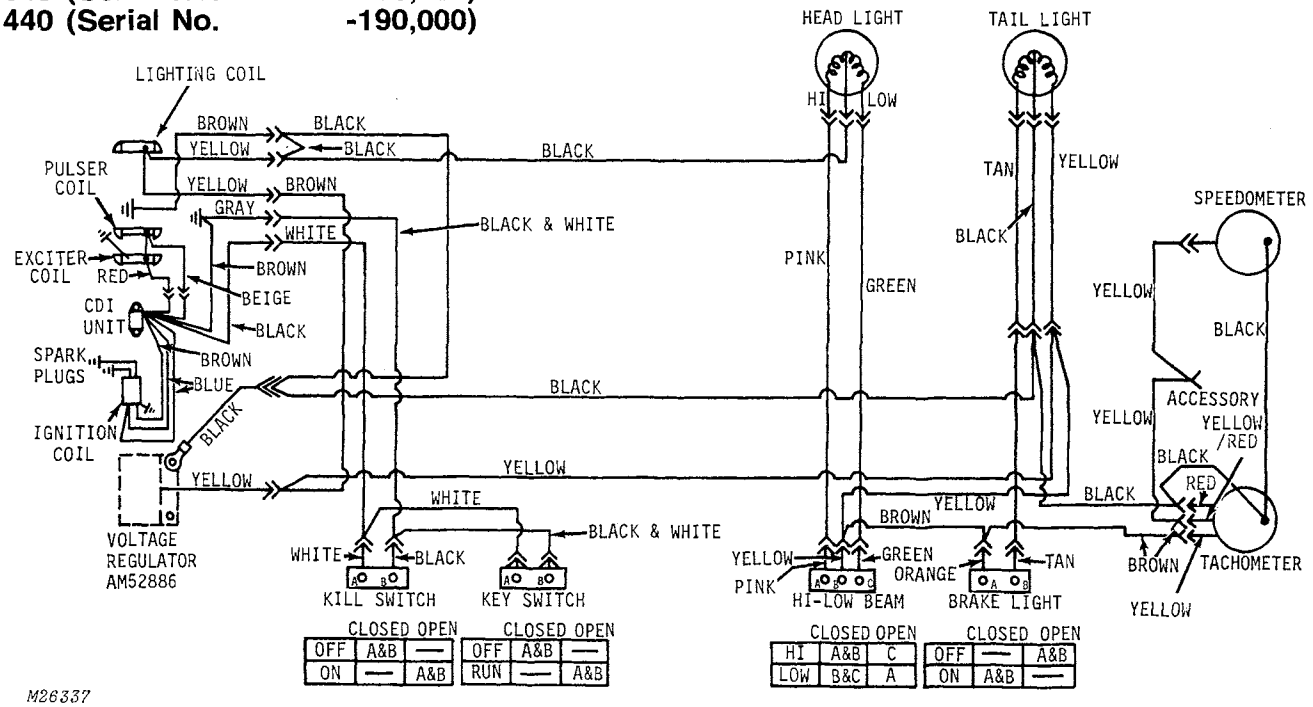
Section 40
ELECTRICAL SYSTEM

CONTENTS

1197/4005A/300981

PRINCIPLE OF OPERATION

340 (Serial No. -155,093)
440 (Serial No. -190,000)



M26337

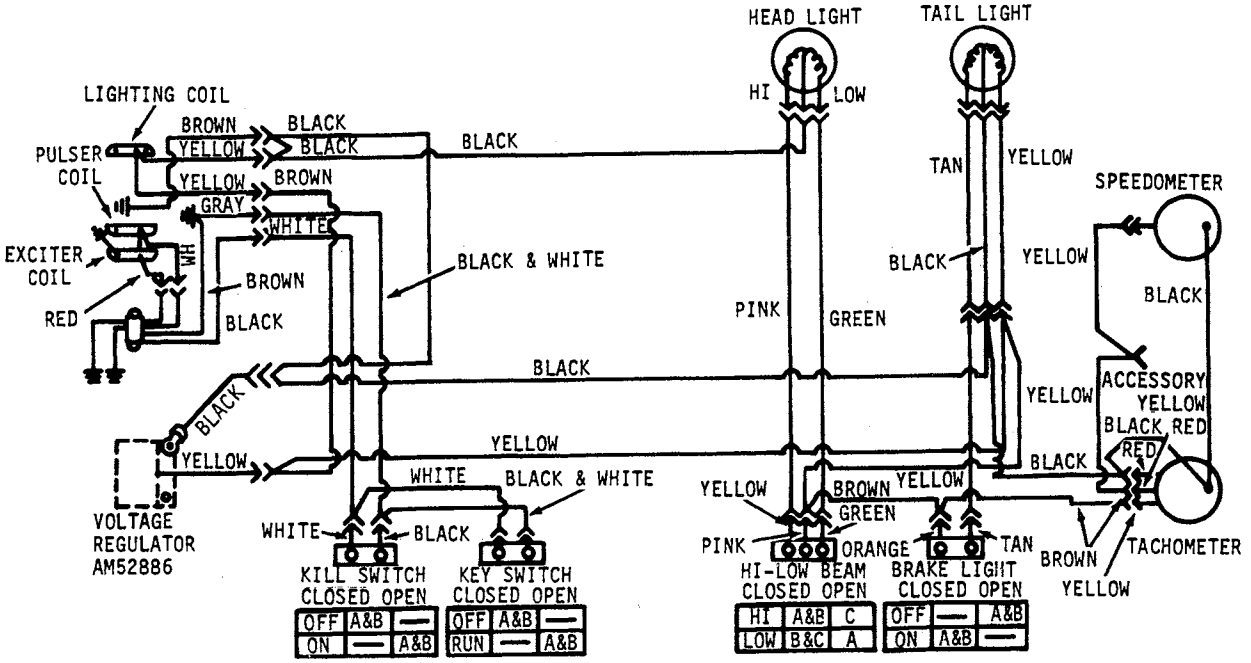
The electrical system, contains a flywheel alternator to provide power for the lighting system and a voltage regulator which limits the average AC voltage, allowing only the voltage needed in the system at a given time.

The lights are automatically "ON" whenever the engine is running. A brake light switch turns the brake light "ON" when the brakes are applied.

NOTE: The optional electric start kit is discussed in Group 20.

M26337/11974005B/250981

PRINCIPLE OF OPERATION
340 (Serial No. 155,094-) TRAILFIRE LX



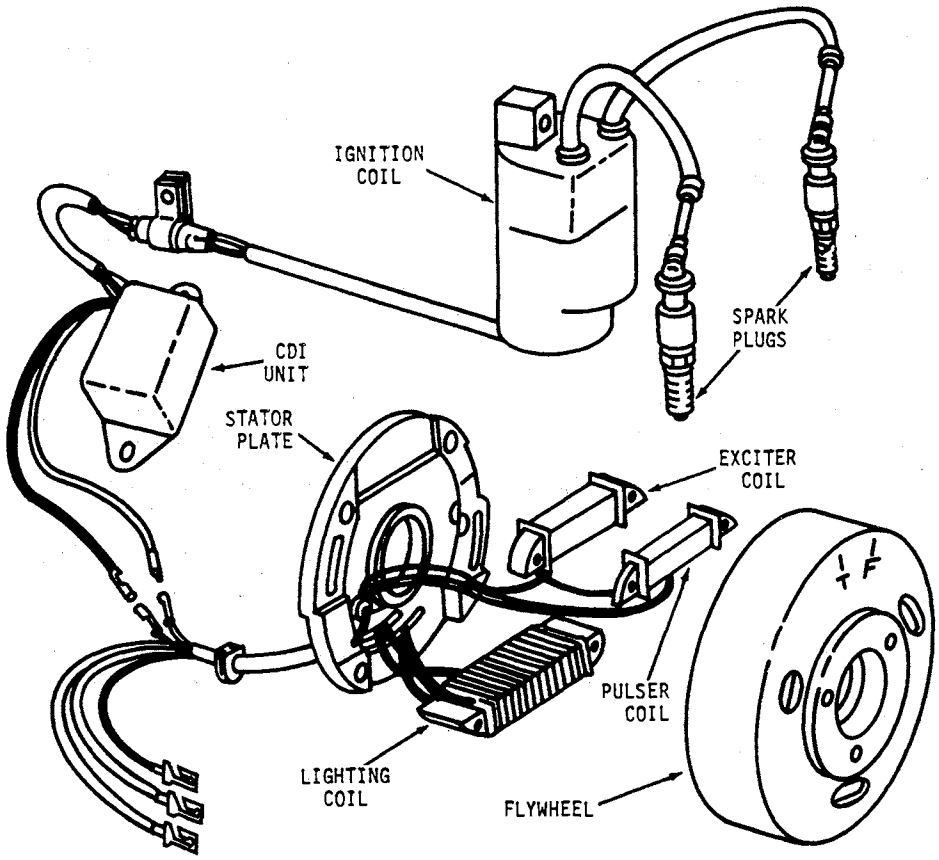
The electrical system contains two sub systems, lighting and ignition. A flywheel alternator provides power for the lighting system. A voltage regulator limits the average AC voltage to system requirements.

Lights are "ON" whenever the engine is running. A brake light switch turns the brake light "ON" whenever the brake is applied.

NOTE: The optional electric start kit is discussed in Group 20.

M29330/1197/4005B1/300981

IGNITION SYSTEM
340 (Serial No. -155,093)
440 (Serial No. -190,000)



The Capacitor Discharge Ignition (CDI), features a breakerless magneto, two capacitor charging coils, a CDI unit and one ignition coil.

As the four-pole-magnet-flywheel rotates, the magnets within the flywheel rotate past the capacitor charging coils, generating AC current within the coils. The charging coils also supply two igntiion signals per revolution to the switching circuit in the CDI unit.

The alternating current from the charging coils passes through a diode in the CDI unit which acts as a 1/2 wave rectifier to change the AC current to DC current to charge the capacitor.

When the capacitor is fully charged, a signal from the charging coils to the switching circuit triggers the gate in the SCR (Silicon Controlled Rectifier) allowing the energy stored in the capacitor to be relased to the ignition coil.

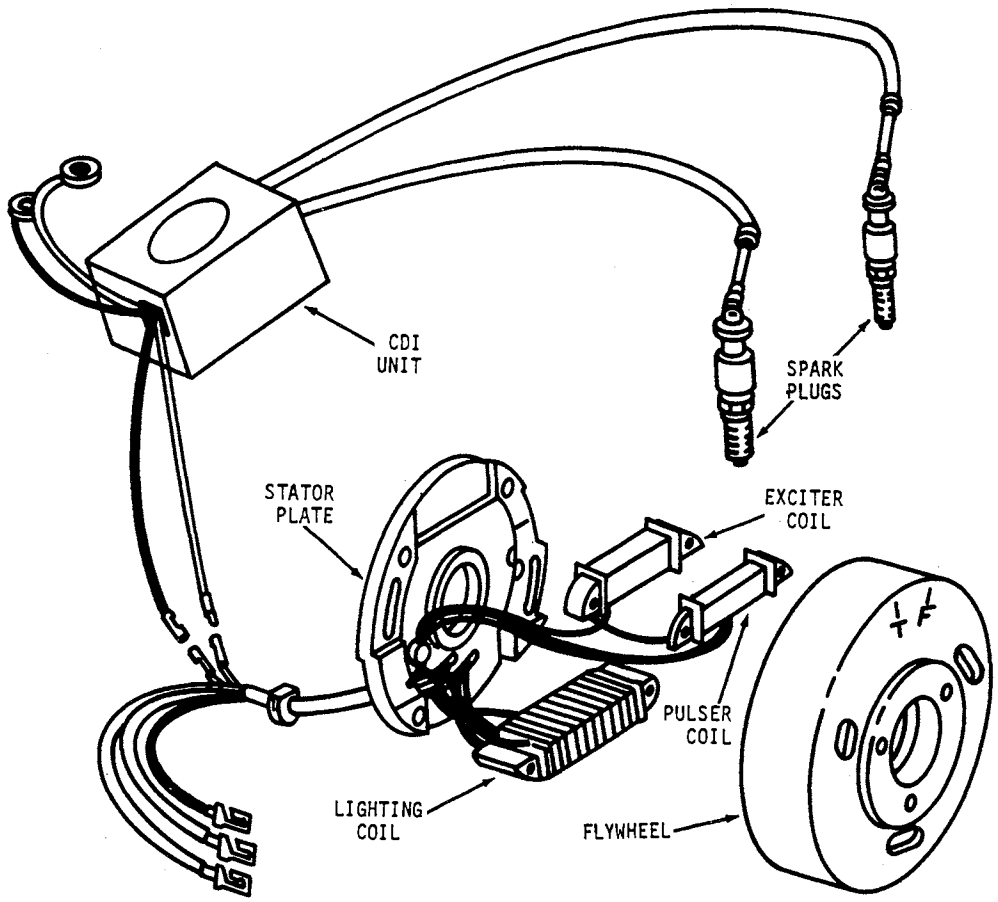
The ignition coil "steps-up" the electrical energy to a level high enough to fire the spark plugs.

The DI diode in the CDI unit is connected in parallel with the primary winding of the ignition coil to prolong arc duration time as the spark plugs fire.

Both spark plugs fire simultaneously.

M29331/11974005C/250981

IGNITION SYSTEM
340 (Serial No. 155,094-)
TRAILFIRE LX



The ignition system is a Capacitor Discharge Ignition (CDI) System consisting of a four pole magnet flywheel, exciter coil, pulser coil, CDI unit and ignition coil.

Alternating current is generated as the flywheel rotates around permanently mounted coils and is conducted to the CDI unit where it is converted to direct current and stored.

As the flywheel timing magnets pass the pulser coil an electrical signal is sent to the CDI unit to release the stored direct current to the ignition coil.

The igntion coil "steps-up" the electrical energy to a high enough level to fire the spark plugs.

Both spark plugs fire at the same time.

M29332/1197/4005C1/011081

TESTS

Instructions are provided in each group for testing components. The tests isolate the problem in the lighting or ignition systems.

High quality test equipment is a must for accurate diagnosis. Always follow the procedures outlined by the equipment manufacturer to supplement instructions contained in this manual.

NOTE: Because there are many manufacturers of test equipment, it is important to follow the manufacturer's recommendations if the procedures in this manual should contradict those of the manufacturer.

1197/4005D/300981

DIAGNOSE MALFUNCTIONS

Lights Will Not Light

Electric connections loose or wires damaged.
Alternator faulty.
Bulbs burned out.
Voltage regulator faulty.

Brake Light Will Not Light

Brake light switch faulty.
Electrical connections loose or wires damaged.
Bulb burned out.

Bulbs Burn Out Often

Wrong type bulbs used.
Voltage regulator faulty.

Lights Too Bright or Too Dim

Voltage regulator faulty.
Defective alternator.

Engine Hard To Start

Spark plugs fouled or defective.
Engine not timed properly.
Electrical connections loose or corroded.

Engine Misfires

Spark plugs fouled or defective.
Electrical connections loose or corroded.
Engine not timed properly.

Engine Overheating

Engine not timed properly.

Engine Kicks Back and Backfires

Engine not timed properly.

1197/4005E/300981

TEST CAPACITOR DISCHARGE IGNITION WITH JDM-74 TESTER

CAUTION: Capacitor discharge ignition systems can produce injurious electrical shock. Always stop engine before touching or working on any ignition components. DO NOT hold spark plugs, leads or connectors in your hand to check for spark.

IMPORTANT: Never use a 12-volt test light on CDI or the system will be destroyed.

1. Make sure all connections are clean and tight.
2. Check all wiring for damage.
3. Install new spark plugs.
4. Read and understand all test procedures.
5. Perform all tests in sequence.
6. Test ignition and kill switches before performing tests on ignition. They must be functioning properly.

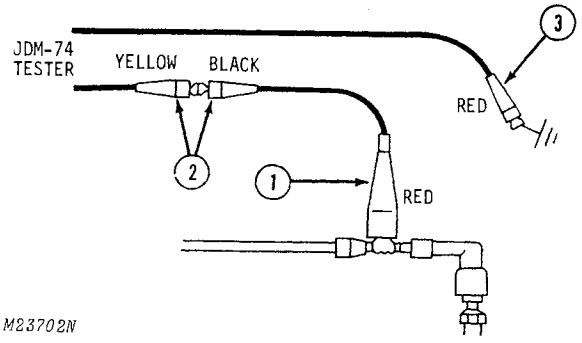
1197/4010A/280981

TEST #1 (COIL OUTPUT)

1. Connect test adaptor (red end) to either spark plug cable (as close to plug as shown).

2. Connect JDM-74 Tester yellow lead to Test Adaptor (black end).

3. Connect JDM-74 Tester red lead to ground.



M23702N

M23702/1197/4010B/250981

4. Set tester for "LOW" range.

5. Turn tester dial to "25".

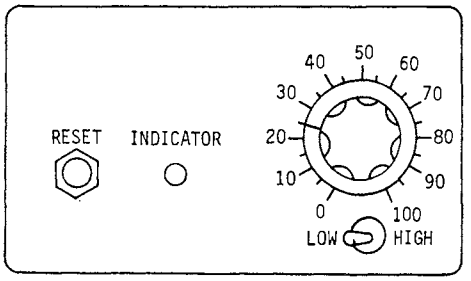
6. Turn key switch "ON" and place emergency stop switch in center position.

7. Crank engine with starter rope and observe tester indicator light.

NOTE: If engine starts, allow it to idle while observing indicator. Then, shut engine off.

8. Push reset button and repeat Step 6 twice.

9. Repeat procedure on remaining spark plug.



Test Results

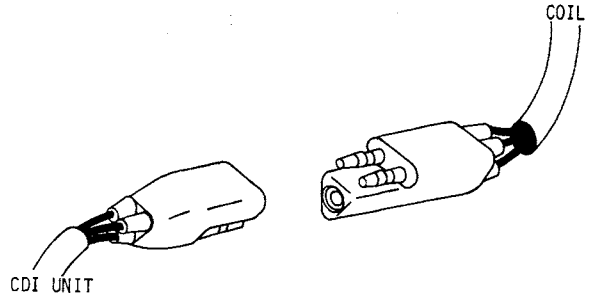
*Indicator lights on both spark plugs.
Ignition system is OK. Remove test leads and check for other causes.

*Indicator does not light on one or both spark plugs.
Remove test leads and proceed to Test #2.

M23703/1197/4010C/250981

TEST #2 (CDI UNIT OUTPUT)

1. Separate three-wire connector between coil and CDI unit.



M23704N

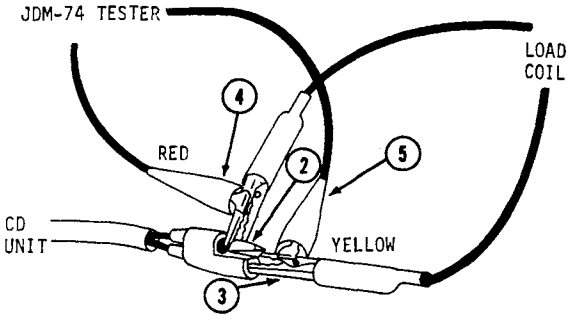
M23704/1197/4010D/250981

2. Connect either load coil lead to male terminal (brown lead) on CDI end of three-wire connector.

3. Connect remaining load coil lead to both female terminals (blue leads). Make sure contact is good on both terminals.

4. Connect JDM-74 Tester red lead to load coil lead on male terminal (brown lead).

5. Connect JDM-74 Tester yellow lead to load coil lead on female terminal (blue lead).



M23705/1197/4010D1/250981

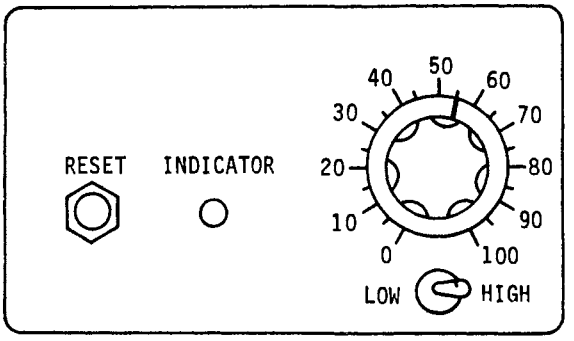
6. Set tester for "HIGH" range.

7. Turn dial to "55".

8. Turn key switch "ON" and place emergency stop switch in center position.

9. Crank engine with starter rope and observe indicator.

10. Push reset button and repeat Step 8 twice.



Test Results

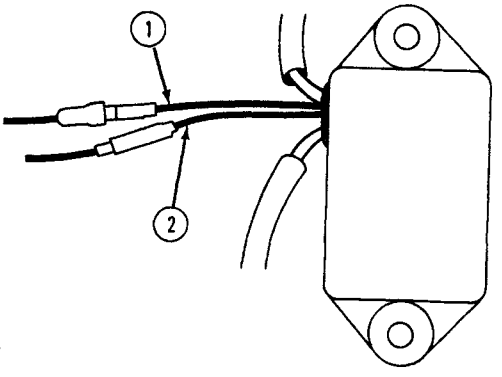
* Indicator lights.
  Remove test leads and replace coil.
* Indicator does not light.
  Remove test leads, reconnect three-wire connector and proceed to Test #3.

M23706/1197/4010E/250981

TEST #3 (EXCITER COIL OUTPUT)

1. Disconnect white CD lead from engine harness.

2. Disconnect red CD lead from engine harness.



M23707N

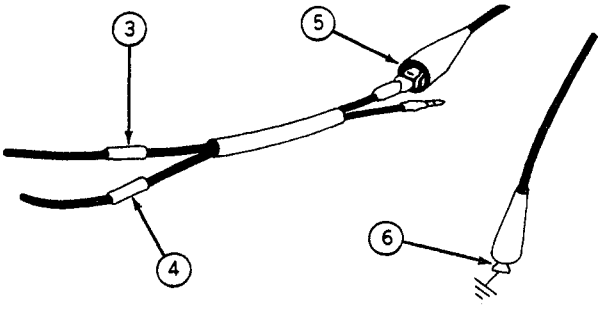
M23707/1197/4010F/250981

3. Connect JDM-74A-6 Test Harness red lead to engine harness red lead.

4. Connect JDM-74A-6 Test Harness yellow lead to engine harness white lead.

5. Connect JDM-74 Tester yellow lead to JDM-74A-6 test harness red lead.

6. Connect JDM-74 Tester red lead to engine ground.



M23708N

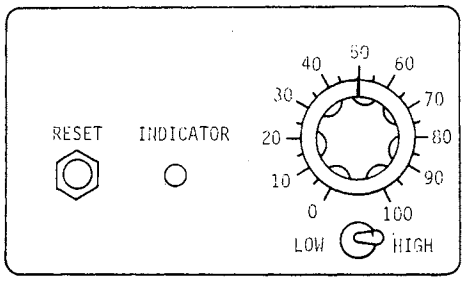
M23708/1197/4010F1/250981

7. Set tester for "HIGH" range.

8. Turn dial to "50".

9. Crank engine with starter rope and observe indicator.

10. Push reset button and repeat Step 9 twice.



M23709N

Test Results

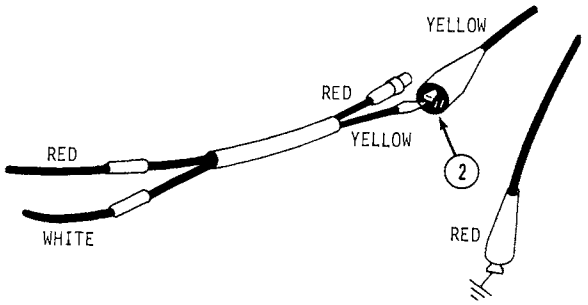
* Indicator lights.
Proceed to Test #4.
* Indicator does not light.
Remove test leads and replace exciter coil.

M23709/1197/4010G/250981

TEST #4 (Pulser Coil)

1. Disconnect JDM-74 Tester yellow lead from JDM-74A-6 test harness red lead.

2. Connect JDM-74 Tester yellow lead to JDM-74A-6 test harness yellow lead.



M23710N

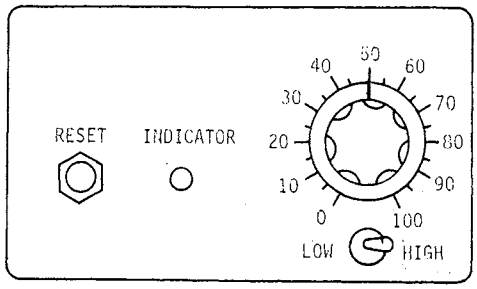
M23710/1197/4010H/250981

3. Set tester for "HIGH" range.

4. Turn dial to "50".

5. Crank engine with starter rope and observe indicator.

6. Push reset button and repeat Step 5 twice.



M23709N

Test Results

* Indicator lights.
  Remove test leads and replace CD unit.
* Indicator does not light.
  Remove test leads and replace pulser coil.

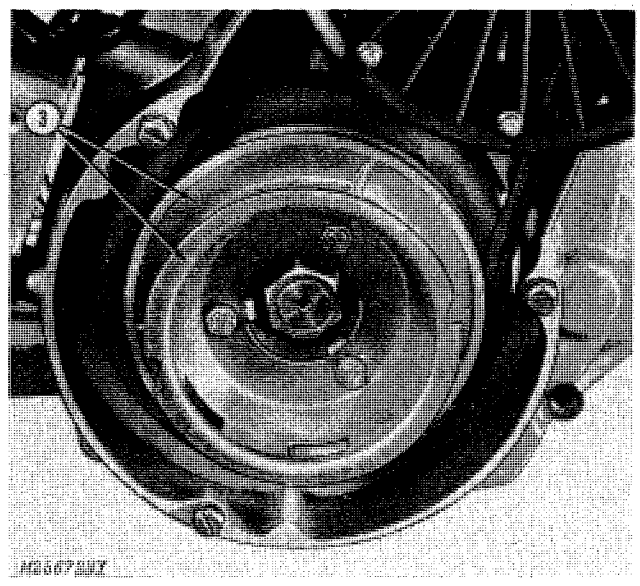
M23709/1197/4010J/250981

REMOVE FLYWHEEL AND STATOR - 340 (Serial No. 95,001-155,093) AND 440 (Serial No. 95,001-120,000)

1. Remove muffler.

2. Remove recoil starter. Set starter in tunnel. DO NOT remove rope.

3. Remove recoil starter cup and fan pulley.

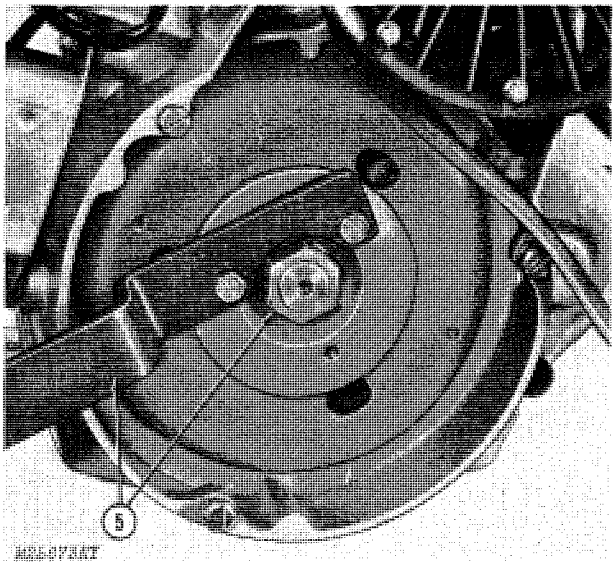


M25672/1197/4010J/250981

4. Bend up tangs on lock washer.

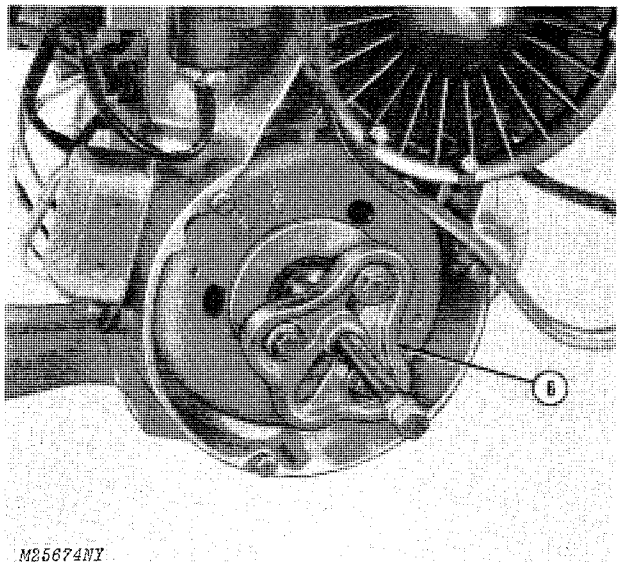
5. Use JDM-64-1 Flywheel Holding Tool to hold flywheel and remove nut and lock washer.

NOTE: Modify JDM-64-1 Flywheel Holding Tool by drilling out holes to (9.5 mm) 3/8-inch. Elongate holes to fit flywheel.



M25673/1197/4010K/250981

6. Remove flywheel with an air or electric impact wrench and JDM-9 Puller.

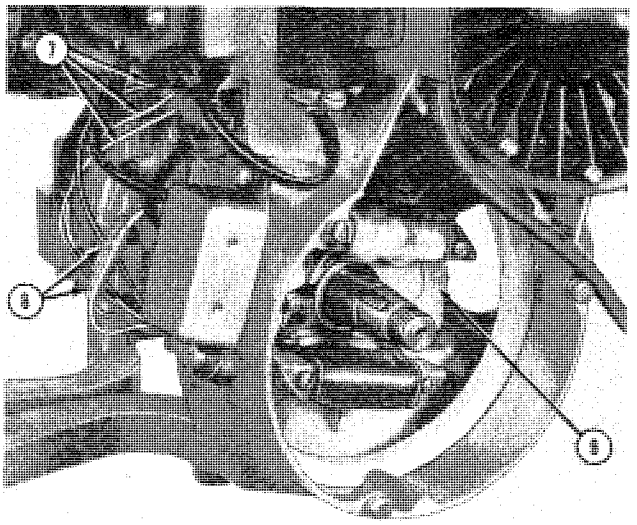


M25674/1197/4010L/250981

7. Remove two yellow leads and one brown lead from connector. Mark their locations in connector for reassembly.

8. Disconnect red lead and white lead.

9. Remove stator screws and pull leads and grommet through flywheel.



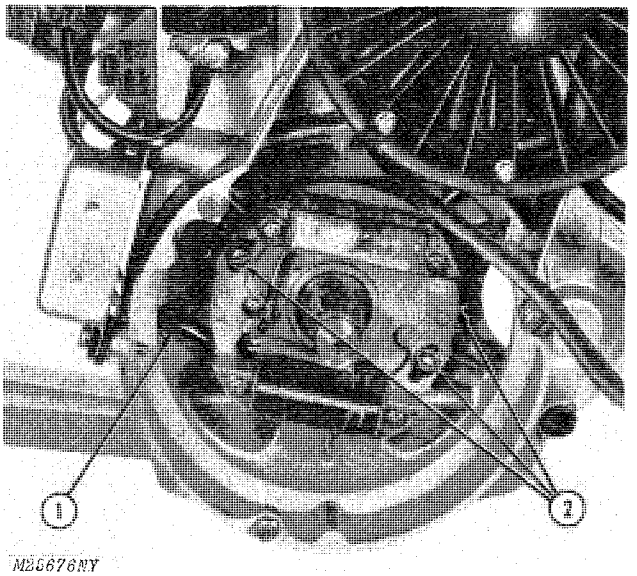
M25675NY

M25675/1197/4010M/250981

INSTALL STATOR AND FLYWHEEL - 340 (Serial No. 95,001-155,093) AND 440 (Serial No. 95,001-120,000)

1. Guide stator leads through grommet.

2. Install stator so that timing mark aligns with top of ridge on crankcase and tighten stator screws.

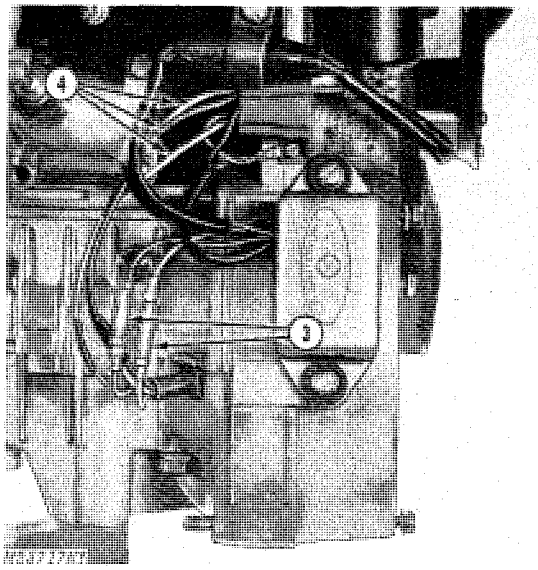


M25676NY

M25676/1197/4010N/250981

3. Connect red lead and white lead.

4. Install two yellow and one brown lead in connector.



M23717/1197/4010O/250981

5. Place flywheel key on crankshaft.

6. Install flywheel, lock washer and nut.

NOTE: Lock washer has a tang to engage keyway.

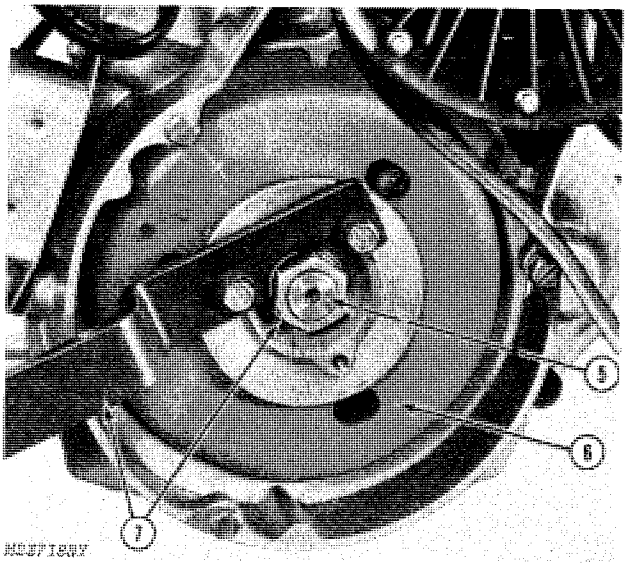
7. Hold flywheel with JDM-64-1 Flywheel Holding Tool and tighten nut to (81.3 N·m) 60 ft-lbs torque.

8. Bend up tabs on lock washer.

9. Time the engine.

10. Install recoil starter.

11. Install muffler.



M23718/1197/4010P/250981

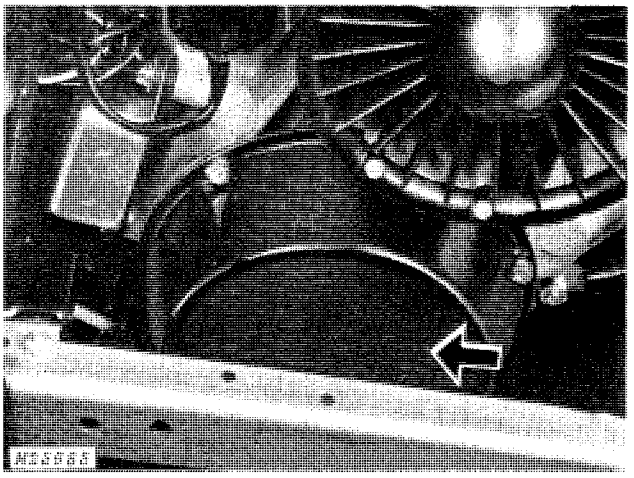
REMOVE FLYWHEEL AND STATOR - 440 (Serial No. 120,001-190,000)

1. Remove muffler.

2. Remove air intake duct.

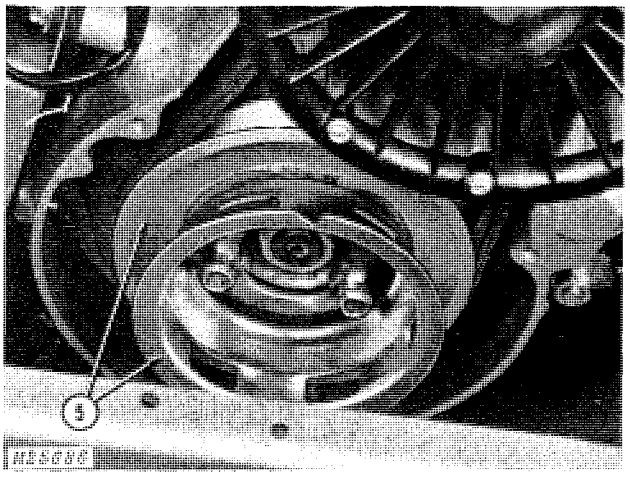
3. Disconnect spark plug leads.

4. Remove recoil starter. Set starter in tunnel. DO NOT remove rope.



M25685/1197/4010O/250981

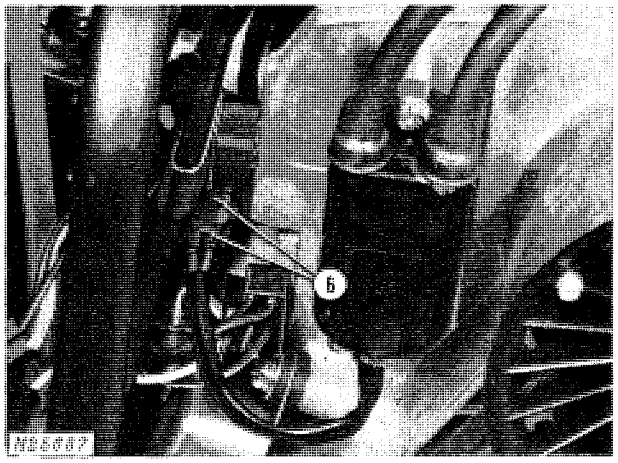
5. Remove starter pulley and fan belt pulley.



M25686/1197/4010R/250981

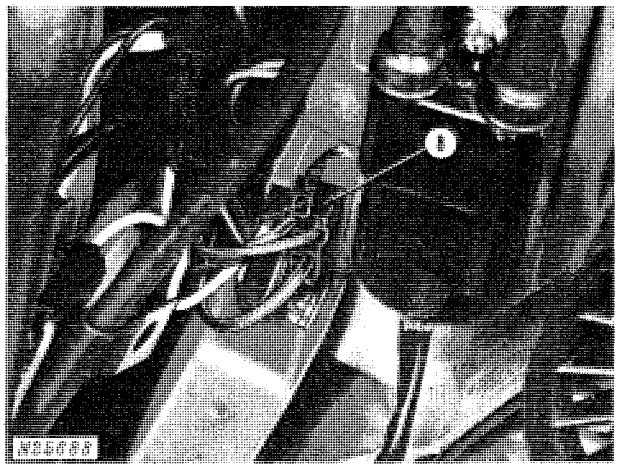
6. Disconnect harness connector and remove clamp.

7. Remove three screws securing engine shroud to fan housing.



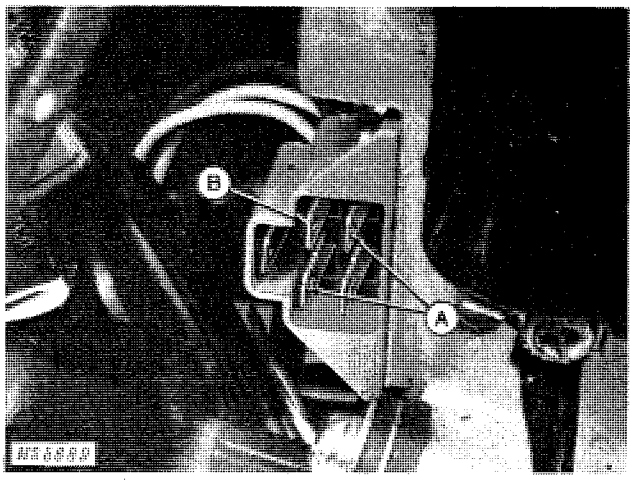
M25687/1197/4010S/250981

8. Disconnect wiring harness connector.



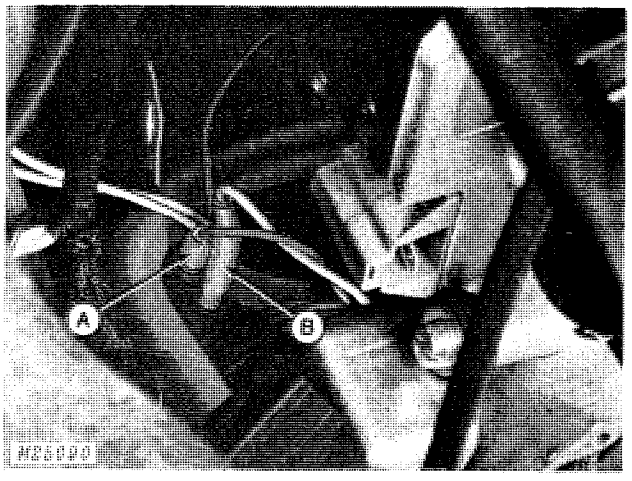
M25688/1197/4010T/250981

9. Remove two yellow leads (A) and one brown lead (B) from connector. Mark their location for reassembly.



M25689/1197/4010U/250981

10. Disconnect red lead (A) and white lead (B).

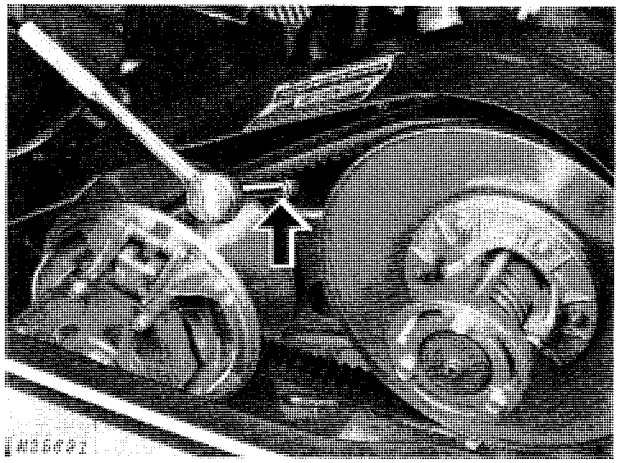


M25690/1197/4010V/250981

11. Remove five nuts from backside of fan housing. Use a long extension to remove the lower rear nut. Remove upper rear nut with a wrench.

12. Remove flywheel housing.

13. Bend up tangs on flywheel lock washer.

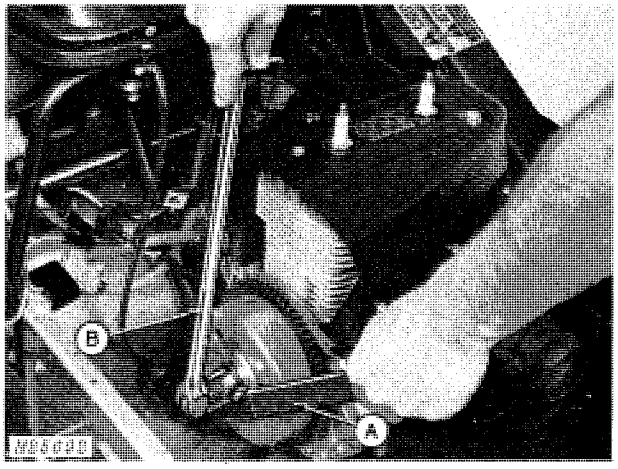


M25691/1197/4010W/250981

14. Use JDM-64-1 Flywheel Holding Tool (A) and breaker bar (B). Remove flywheel nut and lock washer.

NOTE: Use cap screws from starter pulley to install JDM-64-1 Flywheel Holding Tool.

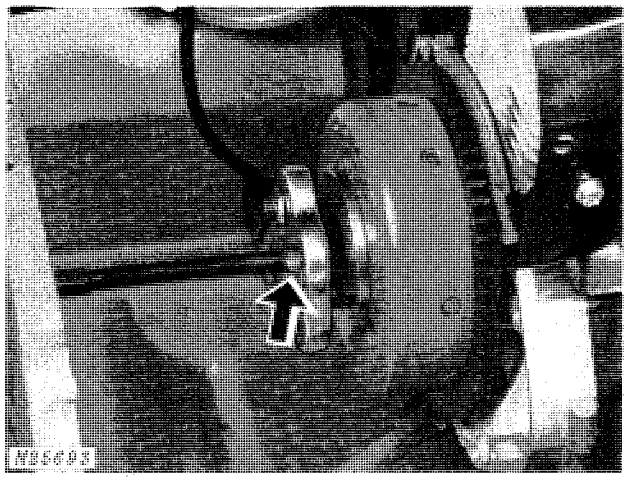
Modify JDM-64-1 Flywheel Holding Tool by drilling out holes to (9.5 mm) 3/8 inch. Elongate holes to fit flywheel.



M25692/1197/4010X/250981

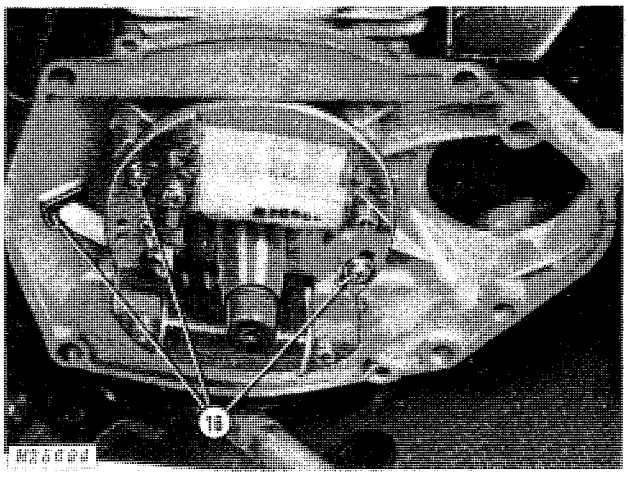
15. Remove flywheel with an air or electric impact wrench and JDM-9 Puller.

NOTE: DO NOT strike puller bolt with hammer. Strike flywheel with plastic or wood mallet in line with flywheel key.



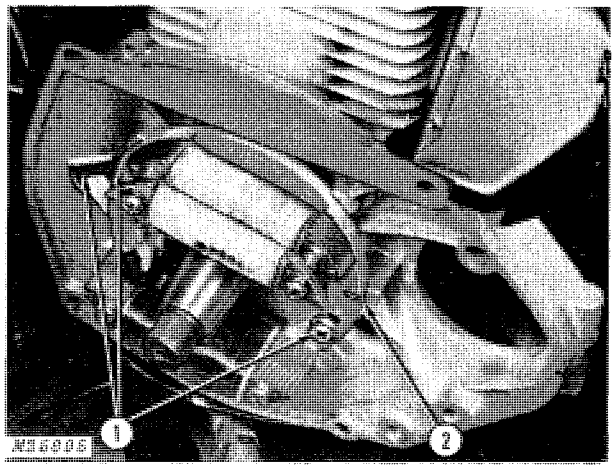
M25693/1197/4010Y/250981

16. Remove stator screws. Pull leads and grommet through crankcase.



M25694/1197/4010Z/250981

INSTALL STATOR AND FLYWHEEL - 440 (Serial No. 120,001-190,000)



1. Guide stator leads through grommet and set against crankcase.

2. Align mark on stator with top of ridge on crankcase.

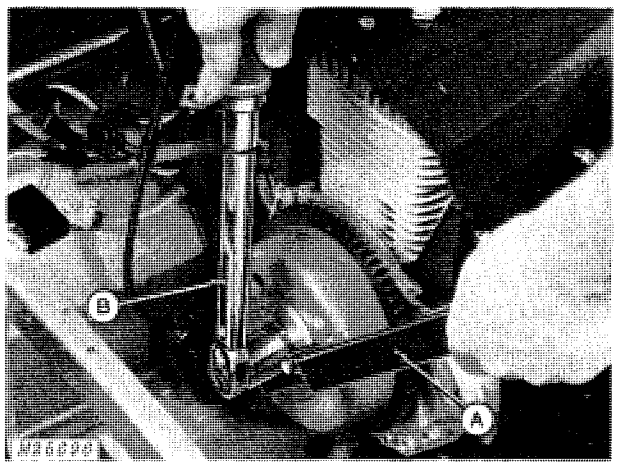
3. Tighten stator screws.

4. Install flywheel key in keyway on crankshaft.

5. Install flywheel, lock washer and nut.

NOTE: Lock washer has a tang to engage keyway.

M25695/1197/4010AA/250981



6. Hold flywheel with JDM-64-1 Flywheel Holding Tool (A), and tighten flywheel nut to (81 N·m) 60 ft-lbs torque using torque wrench (B).

7. Bend tabs on lock washer to secure nut.

8. Install flywheel housing.

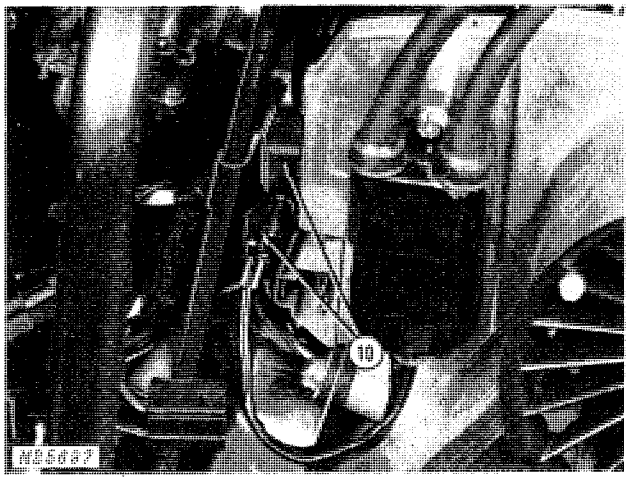
9. Install three engine shroud screws.

M25696/1197/4010AB/250981

10. Connect wiring harness connector. Install engine wiring harness clamp.

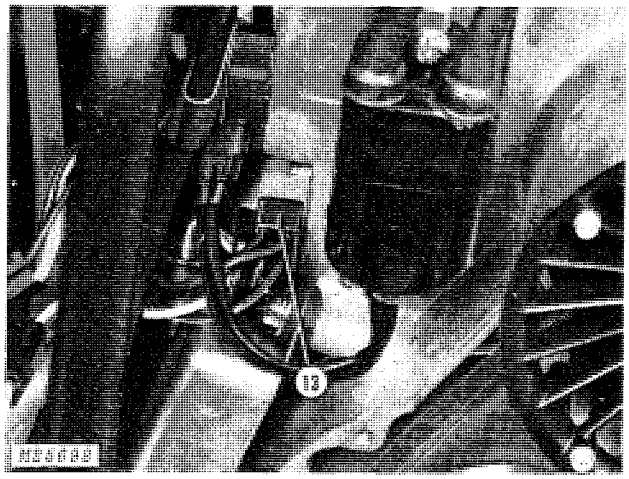
11. Connect red lead and white lead.

12. Install two yellow leads and one brown lead in connector as marked when removed.



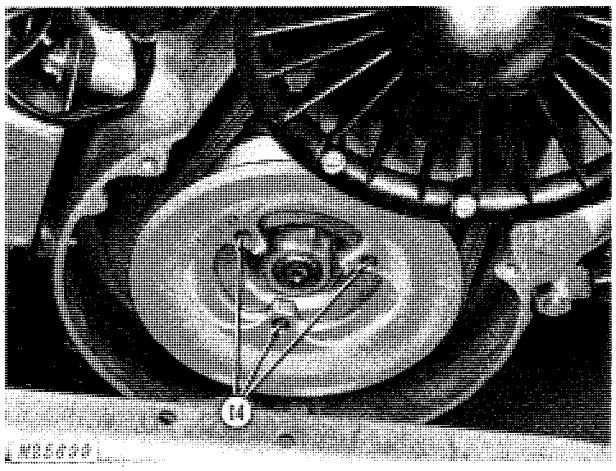
M25697/1197/4010AC/250981

13. Connect wiring harness connector.



M25698/1197/4010AD/250981

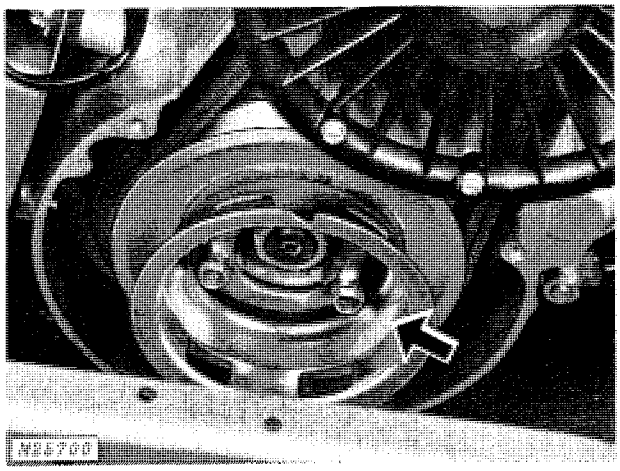
14. Set fan belt on fan pulley and install pulley. Line up mounting holes with flywheel.



M25699/1197/4010AE/250981

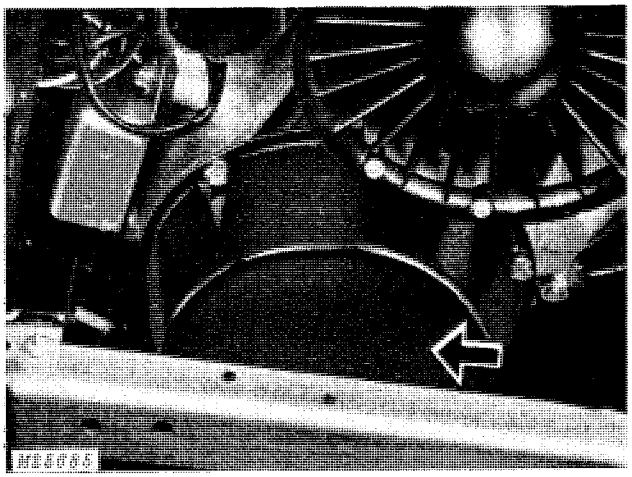
15. Install starter pulley.

16. Install spark plug leads.



M25700/1197/4010AF/250981

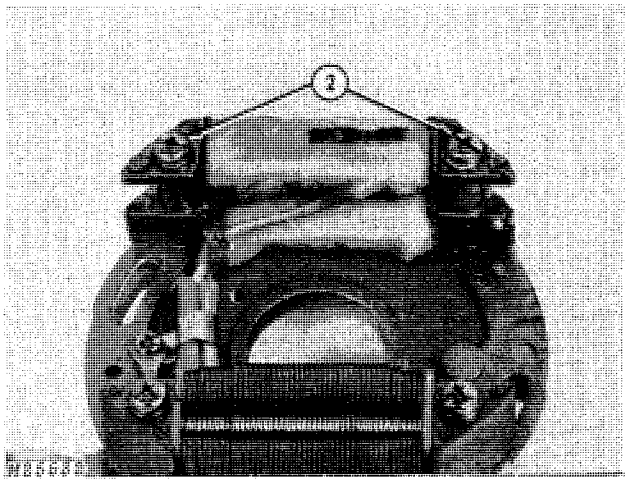
17. Install recoil starter.
18. Install muffler.
19. Install air intake duct.



M25685/1197/4010AG/250981

REPLACE PULSER AND EXCITER COILS

1. Remove flywheel. See "Remove Flywheel and Stator."
2. Remove screws.



M25532/1197/4010AH/250981

3. Chip epoxy seal from connections on coil being replaced.

4. Unsolder connections and remove coil.

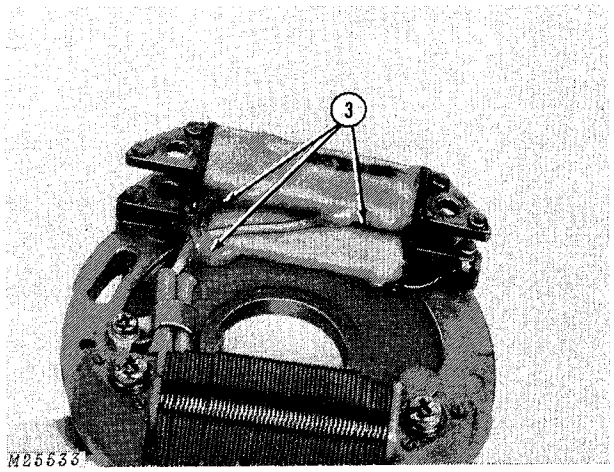
5. Solder leads to new coil with rosin core (high temperature) solder.

6. Seal connections with a two-part epoxy.

IMPORTANT: Make sure all exposed metal is covered thoroughly.

7. Mount exciter coil and pulser coil (in that order) on stator plate.

8. Make sure curvature of coils align with curvature of stator plate; then tighten screws.



M25533/1197/4010AI/250981

CHECK ENGINE TIMING

IMPORTANT: DO NOT use a timing light to time the engine. Timing is most accurately done statically. Using a timing light is not accurate because of varying electrical loads on the system, changes in engine speeds, varying engine temperatures and variance in timing lights.

1. Remove muffler and disconnect spark plugs.

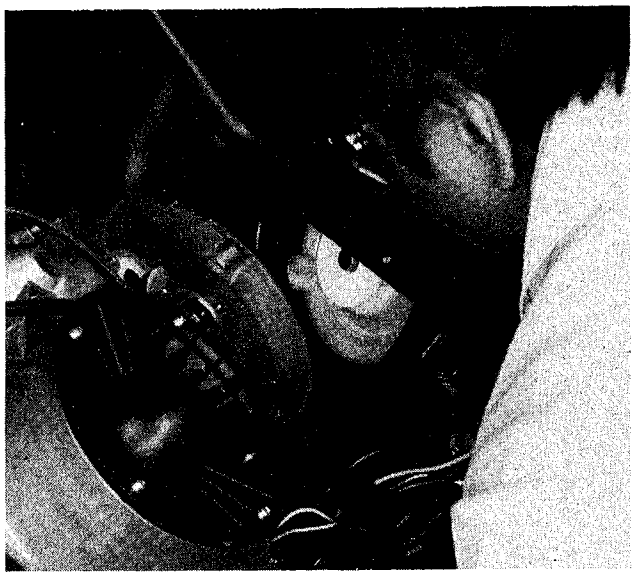
2. Remove recoil.

3. Remove starter cup.

1197/4010AJ/300981

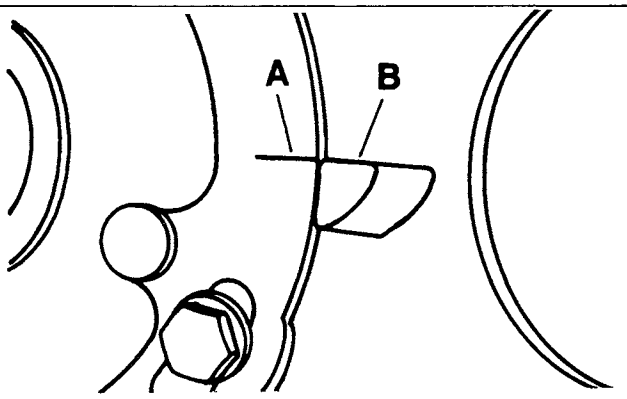
NOTE: Observing the timing marks through a hole in the flywheel is faster and more accurate than removing the flywheel.

4. Align one of the holes in the flywheel with the timing mark on the stator. Use a light to illuminate the timing marks.



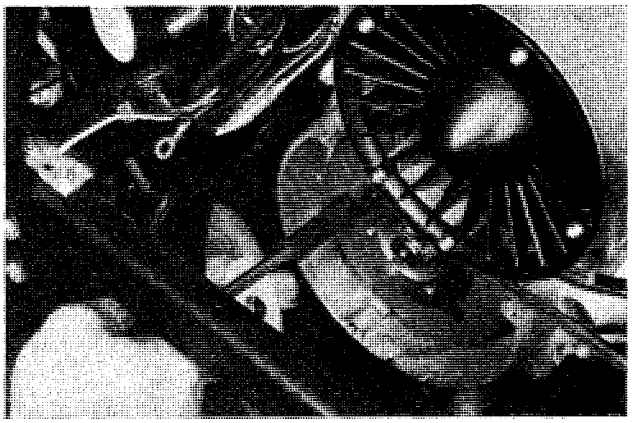
M29327/1197/4010AK/300981

5. The timing mark (A) on the stator should align exactly with the "flat" on the extended portion (B) of the bottom crankcase half when observed through the hole in the flywheel. For correct alignment of the two marks you must look "straight" through the flywheel opening at the stator timing mark and the crankcase parting line.



M29328/1197/4010AL/300981

6. If marks DO NOT align, loosen the stator mounting screws, rotate the stator with a screwdriver until the marks align and tighten the mounting screws. Cover the shank of the screwdriver with a piece of fuel line to prevent flywheel magnets from pulling on the screwdriver. Use the holes in the flywheel to gain access to the two stator mounting screws. Recheck timing after tightening the mounting screws.



M29329/1197/4010AM/300981

7. Install starter cup. Use Loctite on threads of starter cup cap screws.

8. Install recoil and muffler. Connect spark plugs.

1197/4010AN/300981

TEST IGNITION

CAUTION: Capacitor discharge ignition systems can produce injurious electrical shock. Always stop engine before touching or working on any ignition components. DO NOT hold spark plugs, leads or connectors in your hand to check for spark.

IMPORTANT: Never use a 12-volt test light on CDI or the system will be destroyed.

1. Make sure all connections are clean and tight.
2. Check all wiring for damage.
3. Install new spark plugs.
4. Read and understand all test procedures.
5. Perform all tests in sequence.
6. Test ignition and kill switches before performing tests on ignition. They must be functioning properly.

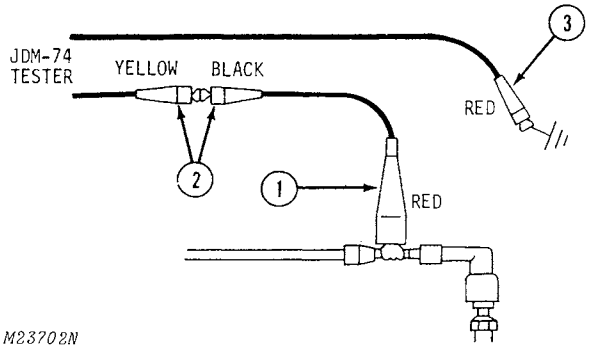
1197/4012A/300981

TEST #1 (CDI and Coil Output)

1. Connect test adaptor (red end) to either spark plug cable, close to plug.

2. Connect JDM-74 Tester yellow lead to test adaptor (black end).

3. Connect JDM-74 Tester red lead to ground.

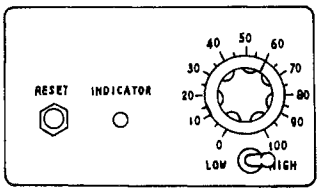


M23702/1197/4012B/300981

4. Switch tester to "HIGH" range.

5. Turn tester dial to "60".

6. Turn key switch "ON" and place emergency stop switch in center position.



7. Crank engine with starter rope and observe tester light.

NOTE: If engine starts, allow it to idle while observing indicator. Then shut engine off.

8. Push reset button and repeat Step 7 twice.

9. Repeat procedure on other spark plug.

Test Results

Indicator lights on both spark plugs:
Ignition system OK.

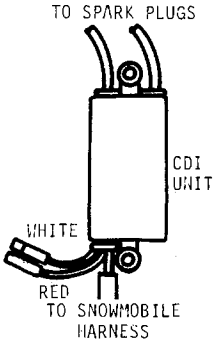
Indicator does not light on one or both spark plugs.
Remove test leads and proceed to Test No. 2.

M25593/1197/4012C/300981

TEST #2 (Exciter Coil Output)

1. Disconnect red CDI lead from engine harness.

2. Disconnect white CDI lead from engine harness.



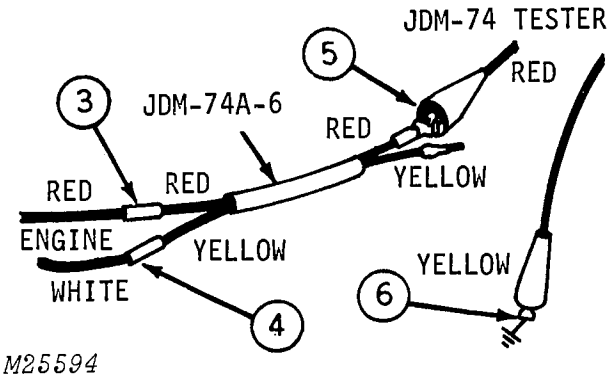
M28439/1197/4012D/300981

3. Connect JDM-74A-6 Test Harness red lead to engine harness red lead.

4. Connect JDM-74A-6 Test Harness yellow lead to engine harness white lead.

5. Connect JDM-74 Tester red lead to JDM-74A-6 Test Harness red lead.

6. Connect JDM-74 Tester yellow lead to engine ground.



M25594

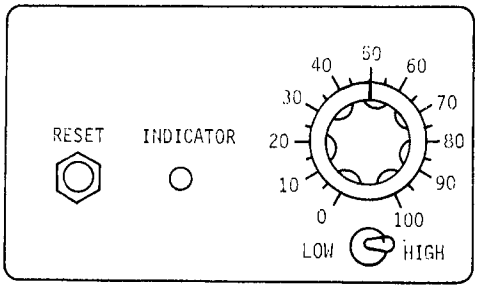
M25594/1197/4012E/300981

7. Switch tester to "High" range.

8. Turn dial to "50".

9. Crank engine with starter rope and observe indicator.

10. Push reset button and repeat Step 9 twice.



M23709N

Test results

Indicator lights

Proceed to Test No. 3

Indicator does not light

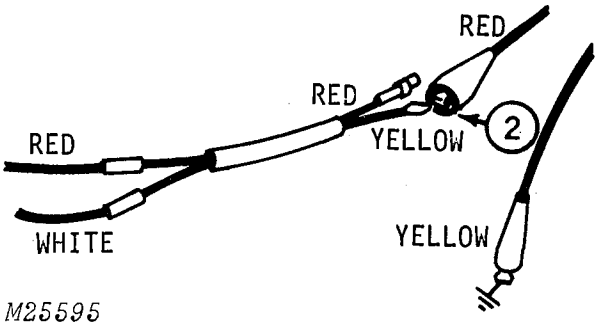
Remove test leads and replace exciter coil.

M23709/1197/4012F/300981

TEST NO. 3 (Pulser Coil)

1. Disconnect JDM-74 Tester red lead from JDM-74A-6 Test Harness red lead.

2. Connect JDM-74 Tester red lead to JDM-74A-6 Test Harness yellow lead.



M25595

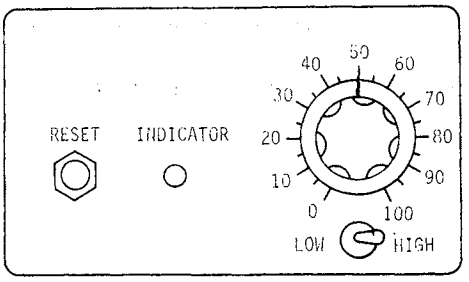
M25595/1197/4012G/300981

3. Switch Tester to "High" range.

4. Turn dial to "50".

5. Crank engine with starter rope and observe indicator.

6. Push reset button and repeat Step 5 twice.



M23709N

Test Results

Indicator lights

Replace CDI unit

Indicator does not light

Remove test leads and relace pulser coil.

M23709/1197/4012H/300981

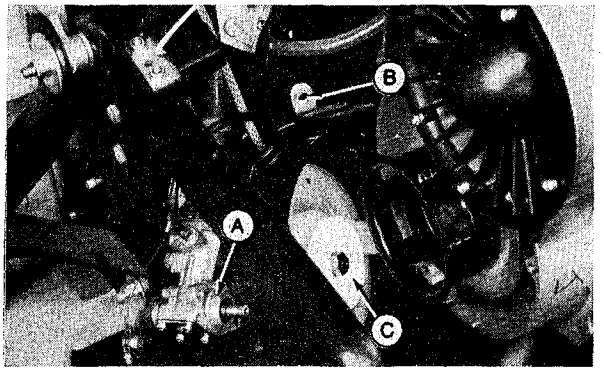
REMOVE FLYWHEEL AND STATOR

1. Remove muffler.

2. Remove air intake duct.

3. Detach oil pump (A) from starter, remove clamp (B) that holds oil lines.

4. Remove recoil starter (C). Lay starter in tunnel. DO NOT remove rope.



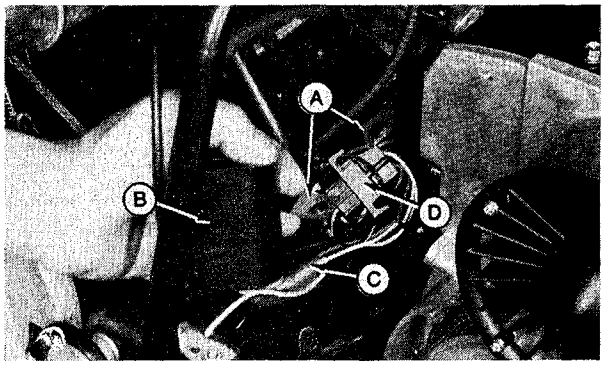
M29320/1197/4012I/300981

NOTE: Set detached components to rear of engine.

5. Remove screw that holds wiring harness and speedometer cable clamps (A).

6. Detach CD module (B) - remove spark plug cables, disconnect red wire, white wire (C), remove two screws.

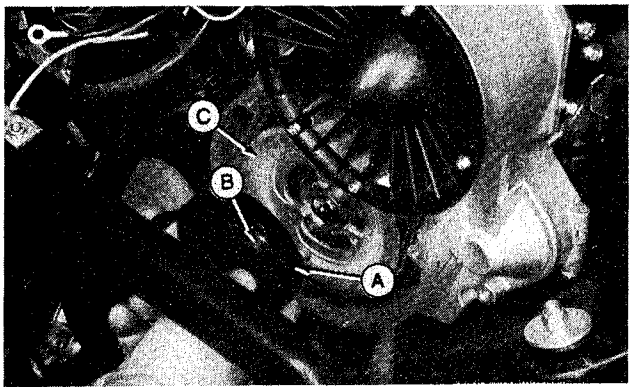
7. Detach connector (D). Loosen two screws.



M29321/1197/4012J/300981

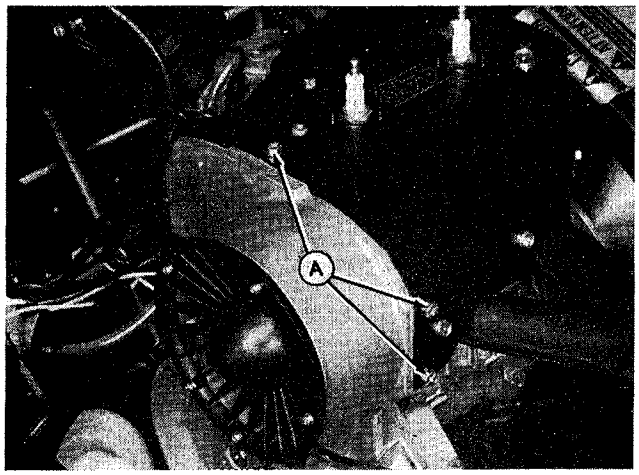
8. Remove starter cup (A) and oil pump drive plate (B).

9. Remove fan drive belt pulley (C).



M29322/1197/4012K/300981

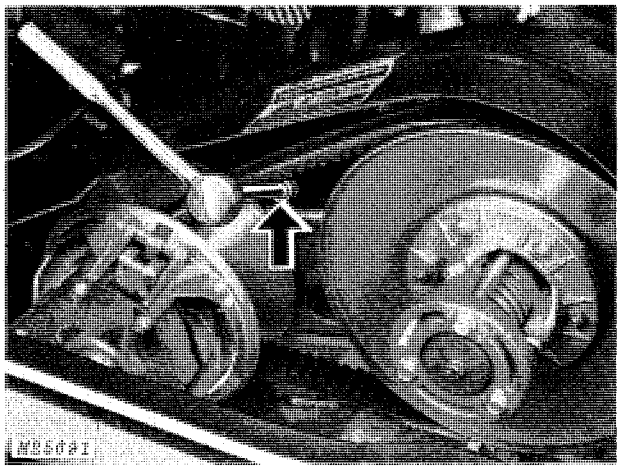
10. Remove three screws (A) - shroud to fan housing.



M29323/1197/4012L/300981

11. Remove five nuts from backside of fan housing. Use a long extension to remove the lower rear nut. Remove upper rear nut with a wrench.

12. Remove flywheel housing.



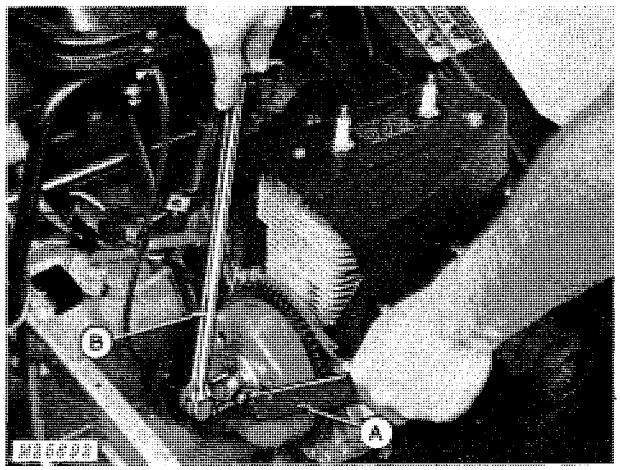
M25691/1197/4012L1/300981

13. Bend up tangs on flywheel lock washer.

14. Use JDM-64-1 Flywheel Holding Tool (A) and breaker bar (B). Remove flywheel nut and lock washer.

NOTE: Use cap screws from starter pulley to install JDM-64-1 Flywheel Holding Tool.

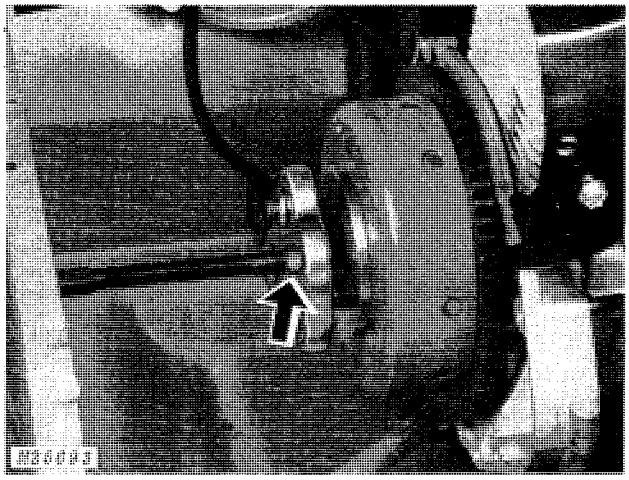
Modify JDM-64-1 Flywheel Holding Tool by drilling out holes to (9.5 mm) 3/8 inch. Elongate holes to fit flywheel.



M25692/1197/4012M/300981

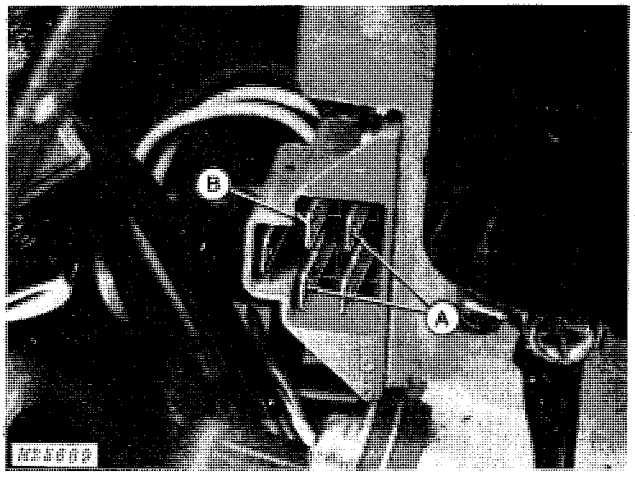
15. Remove flywheel with an air or electric impact wrench and JDM-9 Puller.

NOTE: DO NOT strike puller bolt with hammer. Strike flywheel with plastic or wood mallet in line with flywheel key.



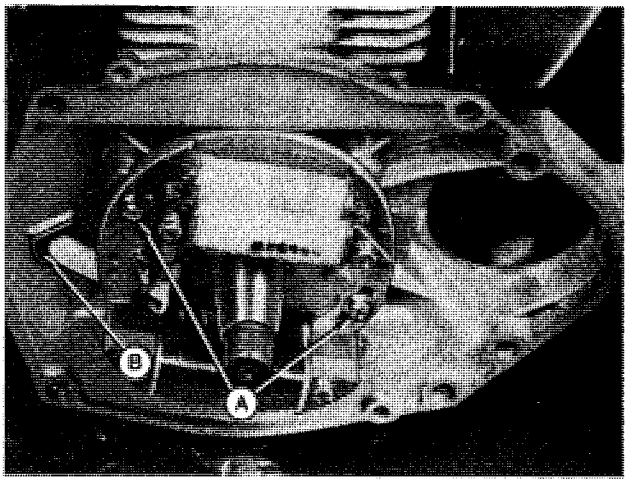
M25693/1197/4012N/300981

16. Remove two yellow leads (A) and one brown lead (B) from connector. Mark their location for reassembly.



M25689/1197/4012O/300981

17. Remove stator screws (A). Pull leads and grommet through crankcase (B).



M29319/1197/4012P/300981

INSTALL STATOR AND FLYWHEEL

1. Guide stator leads through grommet and set against crankcase.

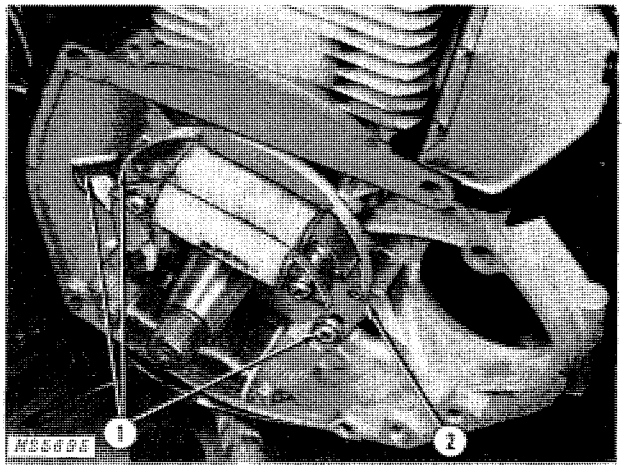
2. Align mark on stator with top of ridge on crankcase.

3. Tighten stator screws.

4. Install flywheel key in keyway on crankshaft.

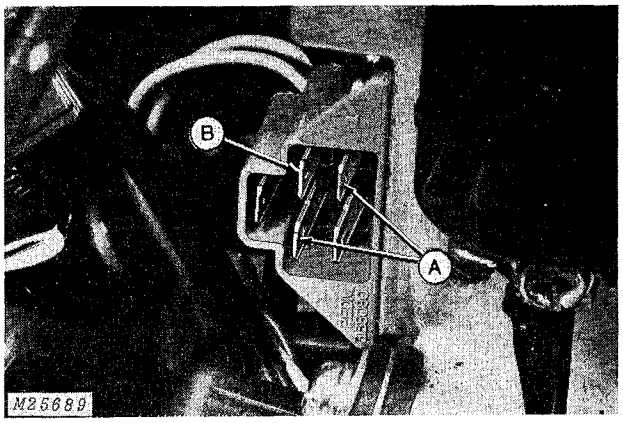
5. Install flywheel, lock washer and nut.

NOTE: Lock washer has a tang to engage keyway.



M25695/1197/4012Q/300981

6. Install two yellow leads (A), one brown lead (B).



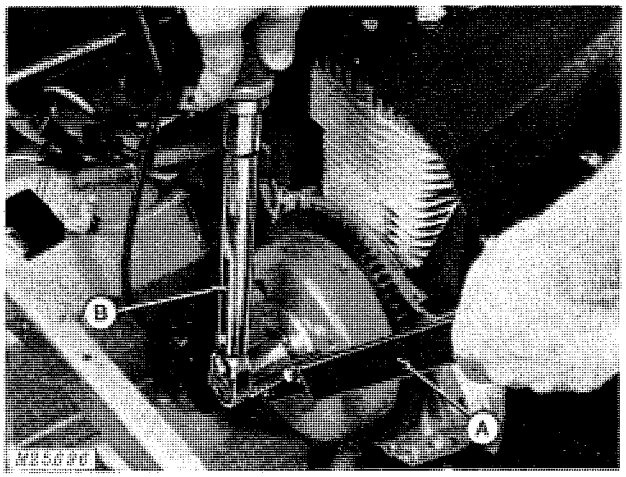
M25689/1197/4012Q1/300981

6. Hold flywheel with JDM-64-1 Flywheel Holding Tool (A), and tighten flywheel nut (81 N·m) 60 ft-lbs torque with torque wrench (B).

7. Bend tabs on lock washer to secure nut.

8. Install flywheel housing.

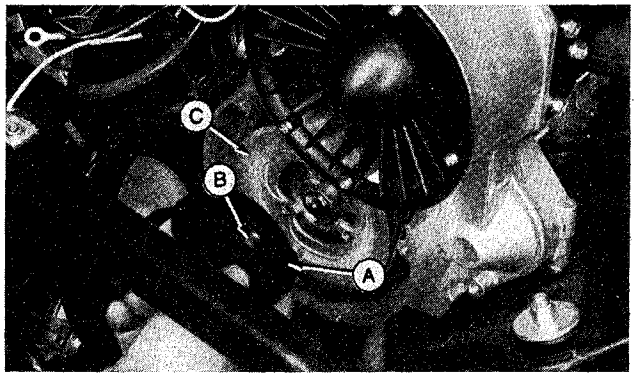
9. Install three engine shroud screws.



M25696/1197/4012R/300981

14. Set fan belt on fan pulley and install pulley (C). Line up mounting holes with flywheel.

15. Install oil pump drive plate (B) and starter cup (A).

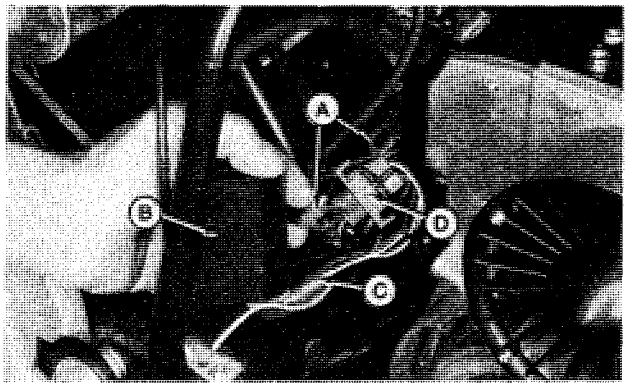


M29322/1197/4012S/300981

16. Install connector (D) - tighten screws.

17. Attach CD Module (B) - connect red wire, white wire (C), install two screws and install spark plug cables.

18. Attach wiring harness and speedometer cable clamps (A).



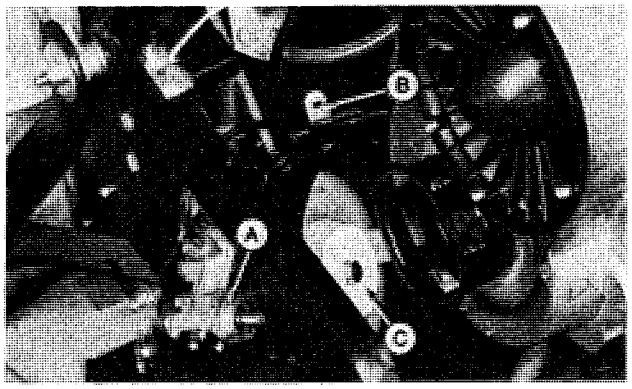
M29321/1197/4012T/300981

19. Install recoil starter (C).

20. Install oil pump (A), clamps (B).

21. Install muffler.

22. Install air intake duct.

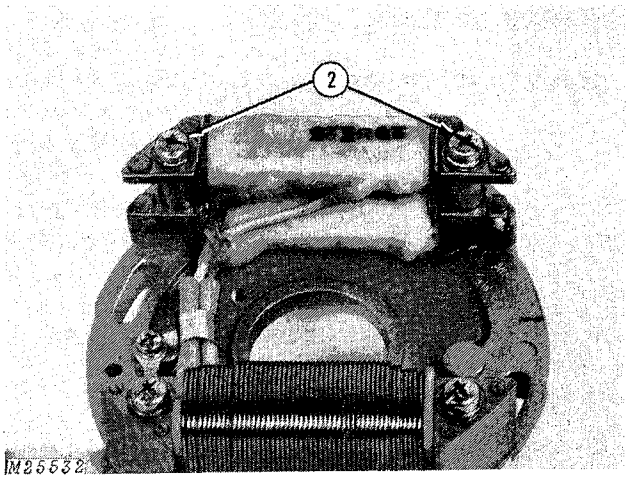


M29320/1197/4012U/300981

REPLACE PULSER AND EXCITER COILS

1. Remove flywheel as outlined in this Group.

2. Remove screws.



M25532/1197/4012V/300981

3. Chip epoxy seal from connections on coil being replaced.

4. Unsolder connections and remove coil.

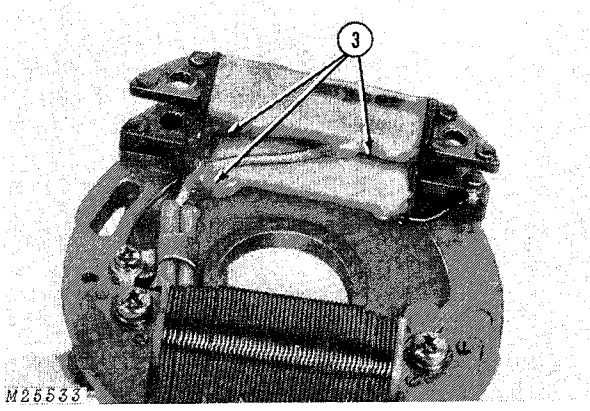
5. Solder leads to new coil with rosin core (high temperature) solder.

6. Seal connections with a two-part epoxy.

IMPORTANT: Make sure all exposed metal is covered thoroughly.

7. Mount exciter coil and pulser coil (in that order) on stator plate.

8. Make sure curvature of coils align with curvature of stator plate; then tighten screws.



M25533/1197/4012W/300981

CHECK ENGINE TIMING

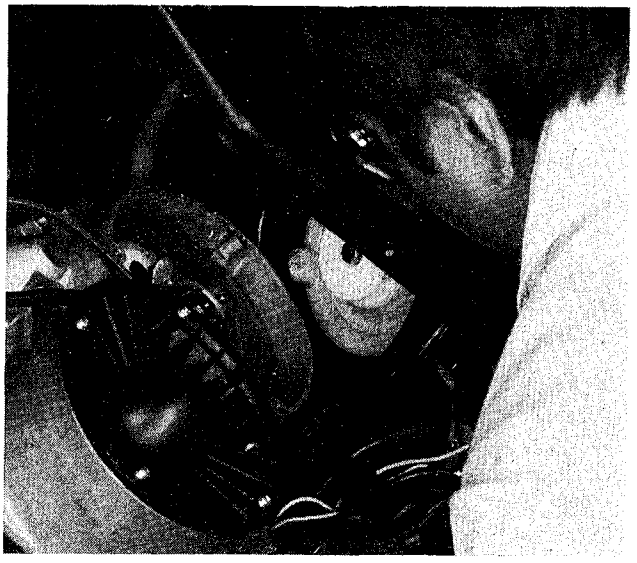
IMPORTANT: DO NOT use a timing light to time the engine. Timing is most accurately done statically. Using a timing light is not accurate because of varying electrical loads on the system, changes in engine speeds, varying engine temperatures and variance in timing lights.

1. Remove muffler and disconnect spark plugs.
2. Remove recoil.
3. Remove starter cup.

1197/4012X/300981

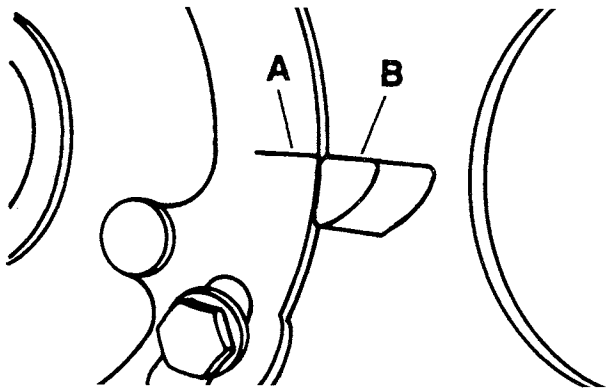
NOTE: Observing the timing marks through a hole in the flywheel is faster and more accurate than removing the flywheel.

4. Align one of the holes in the flywheel with the timing mark on the stator. Use a light to illuminate the timing marks.



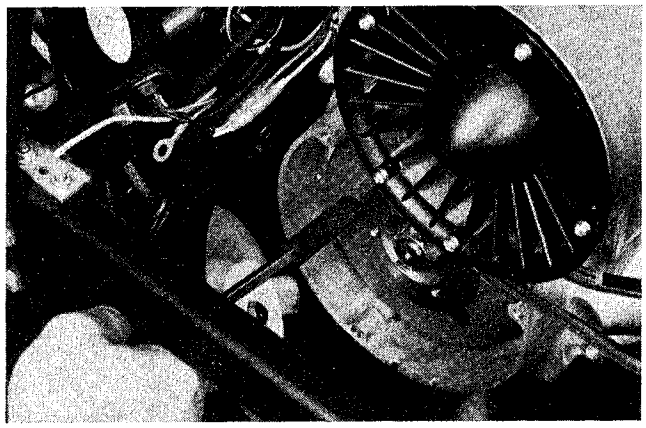
M29327/1197/4012Y/300981

5. The timing mark (A) on the stator should align exactly with the "flat" on the extended portion (B) of the bottom crankcase half when observed through the hole in the flywheel. For correct alignment of the two marks you must look "straight" through the flywheel opening at the stator timing mark and the crankcase parting line.



M29328/1197/4012Z/300981

6. If marks DO NOT align, loosen the stator mounting screws, rotate the stator with a screwdriver until the marks align and tighten the mounting screws. Cover the shank of the screwdriver with a piece of fuel line to prevent flywheel magnets from pulling on the screwdriver. Use the holes in the flywheel to gain access to the two stator mounting screws. Recheck timing after tightening the mounting screws.



M29329/1197/4012AA/300981

7. Install starter cup. Use Locktite on threads of starter cup cap screws.

8. Install recoil and muffler. Connect spark plugs.

1197/4012BB/300981

TEST ALTERNATOR

1. Disconnect five-wire coupler.

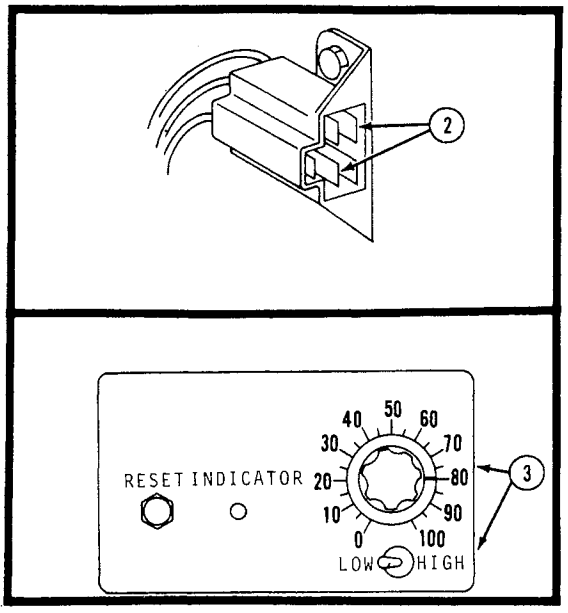
2. Connect JDM-74 Tester between the two yellow leads.

3. Set tester dial at "80" on the "LOW" circuit.

4. Crank engine with starter rope and observe tester indicator light.

5. Push reset button and repeat Step 4 twice.

Test Results
* Indicator lights.
  Alternator is OK.
* Indicator does not light.
  Alternator is defective.



M23726/1197/4015A/250981

TEST VOLTAGE REGULATOR AND LIGHTING COIL

If all the lights burn out at engine speeds above idle, the voltage regulator is defective. Replace voltage regulator.

If lights will not light at any engine speed, check the voltage regulator and lighting coil as follows:

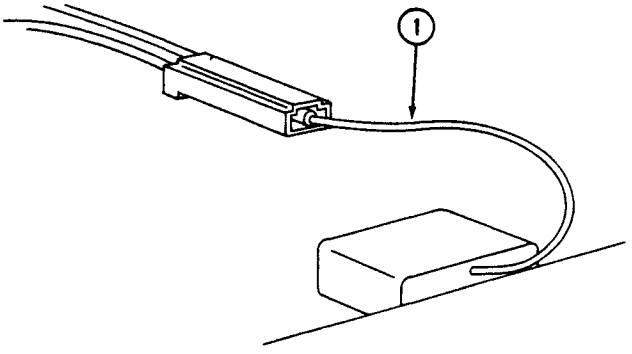
1. Disconnect yellow lead from voltage regulator.

2. Start engine and allow it to idle.

IMPORTANT: Do not run engine above idle speed or all light bulbs will burn out.

Lights Light: Replace the voltage regulator.

Lights Do Not Light: Test the alternator as shown. If alternator tests OK, replace voltage regulator.



M23727/1197/4015B/250981

TEST HEADLIGHT DIMMER SWITCH

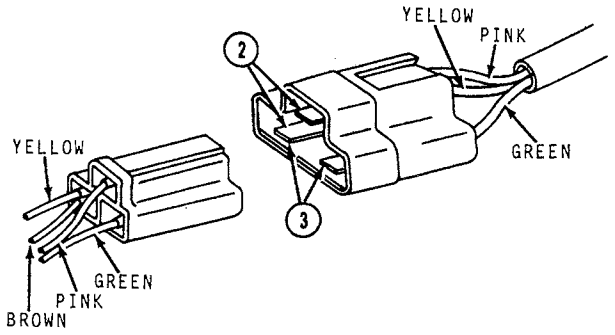
1. Disconnect headlight coupler from wiring harness.

2. Connect flashlight tester between pink and yellow leads. Actuate dimmer switch to high beam. Test light should light.

3. Connect flashlight tester between green and yellow leads. Actuate dimmer switch to low beam. Test light should light.

Test Results

If test light does not react as stated in Steps 2 and 3, the wiring or the dimmer switch is defective.



M23728

M23728/1197/4015C/250981

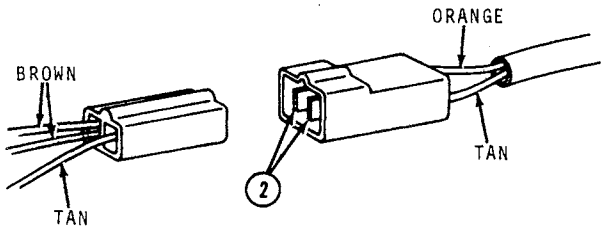
TEST BRAKE LIGHT SWITCH

1. Disconnect brake light coupler from wiring harness.

2. Connect a flashlight tester between the orange and tan leads. Test light should light when brake is applied and go off when brake is released.

Test Results

If test light does not react as stated in Step 2, the wiring or the brake light switch is defective.



M23729

M23729/1197/4015D/250981

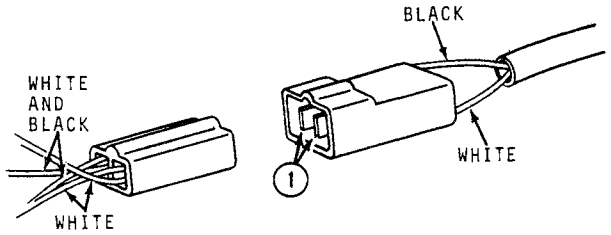
TEST ENGINE KILL SWITCH

1. Disconnect engine kill switch coupler from wiring harness.

2. Connect a flashlight tester between black lead and white lead. Tester should light when kill switch is actuated and go out when kill switch is released.

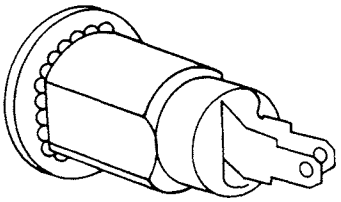
Test Results

If test light does not react as stated in Step 2, the wiring or the engine kill switch is defective.



M28476/1197/4015E/250981

TEST TWO-TERMINAL IGNITION SWITCH



1. Remove coupler from ignition switch.

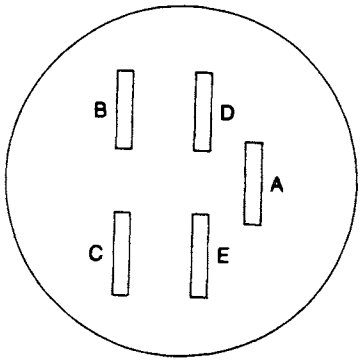
2. Connect a flashlight tester between the switch terminals. Test light should light with the key switch in the "ON" position and light should go out with key switch in the "OFF" position.

Test Results

If test light does not react as stated in Step 2, replace the ignition switch.

M23731/1197/4015F/250981

TEST FIVE-TERMINAL IGNITION SWITCH



M23732

1. Remove coupler from ignition switch.

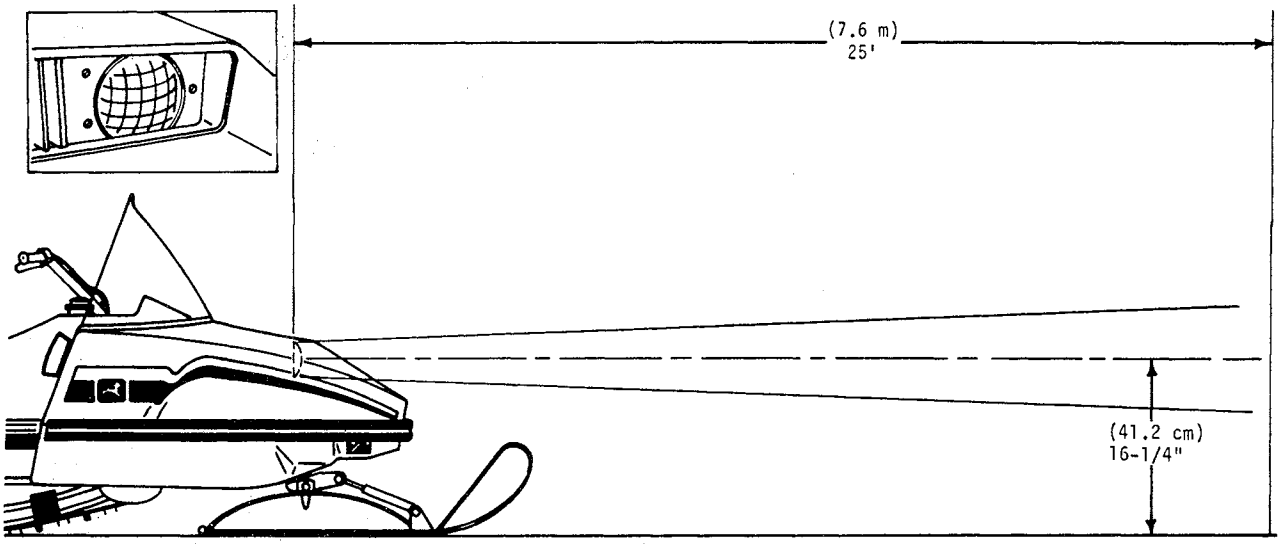
2. Connect a flashlight tester between switch terminals C and D. Test light should light when key is in the "RUN" position only.

Test Results

If test light does not react as stated in Step 2, replace the ignition switch.

M23732/1197/4015G/250981

ADJUST HEADLIGHT



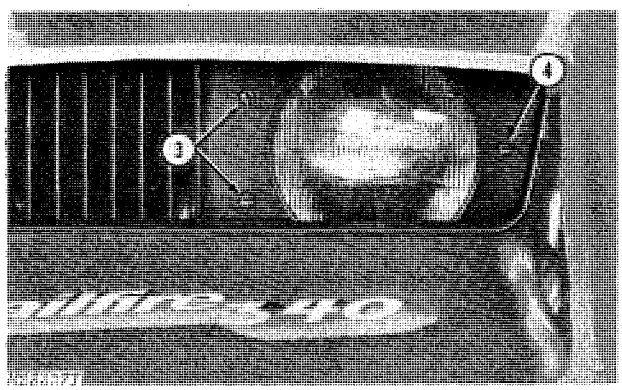
1. Position snowmobile on a flat surface with the headlight (7.6 mm) 25 feet from a vertical surface.

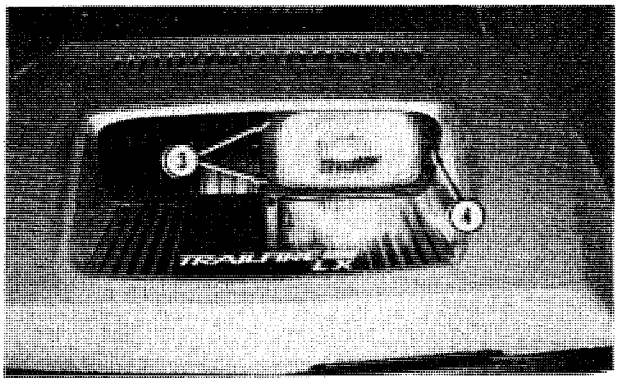
2. With operator on seat and headlight on "HIGH" beam, light beam center line should be straight ahead and (41.2 cm) 16-1/4 inches above ground level.

M23326/1197/4015H/250981

3. Loosen or tighten the two adjusting screws to raise or lower the light beam.

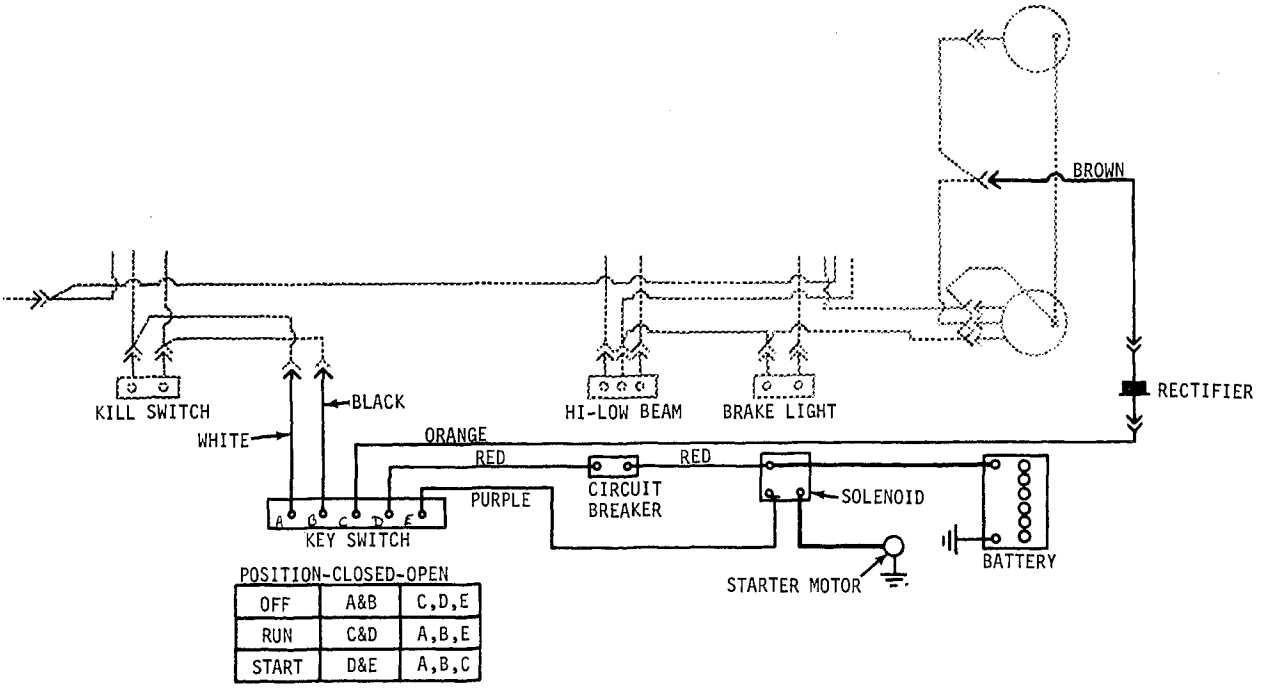
4. Loosen or tighten the adjusting screw to move the light beam right or left.





M23327 M29294/1197/4015I/250981

PRINCIPLE OF OPERATION



POSITION-CLOSED-OPEN

OFF	A&B	C,D,E
RUN	C&D	A,B,E
START	D&E	A,B,C

M23568

The electric start kit consists of a flywheel with ring gear, [340 and 440 Trailfire (Serial No. 95,001-120,000)], and 340 Trailfire (Serial No. 120,001-) starter motor, solenoid, circuit breaker, key switch and rectifier.

Note that the standard two-terminal key switch is replaced with a five-terminal key switch when the electric start kit is installed.

When the key switch is in the "START" position, battery current is directed to the solenoid which activates and connects the battery directly to the starter motor.

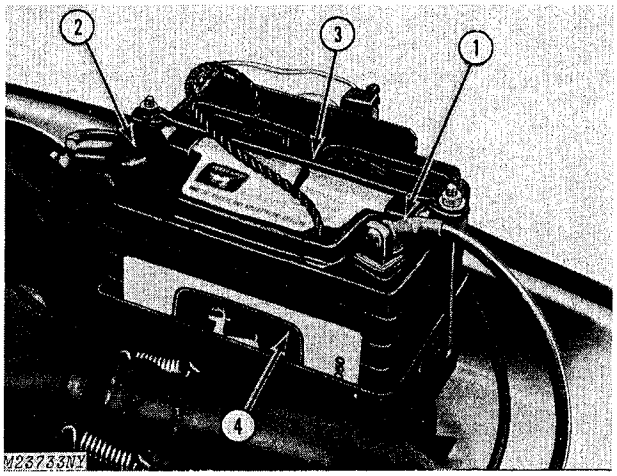
In the "RUN" position, a diode in the rectifier changes the alternating current from the engine alternator to direct current going into the battery. A circuit breaker protects the system from short circuits or electrical overloads.

In the "OFF" position the engine is grounded.

M23568/1197/4020A/250981

REMOVE BATTERY

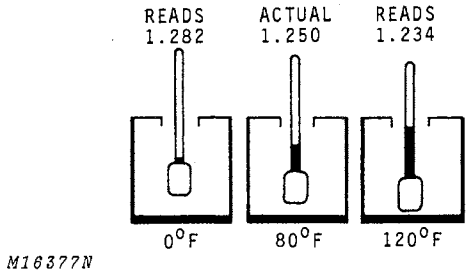
1. Disconnect negative (−) battery cable.
2. Disconnect positive (+) battery cable.
3. Remove battery hold-down.
4. Lift battery out of box.



M23733/1197/4020B/250981

TEST BATTERY SPECIFIC GRAVITY

Use a hydrometer with thermometer to test specific gravity. Specific gravity varies with changing temperatures due to expansion and contraction of electrolyte. Hydrometers are calibrated to measure specific gravity correctly at (27°C) 80°F.

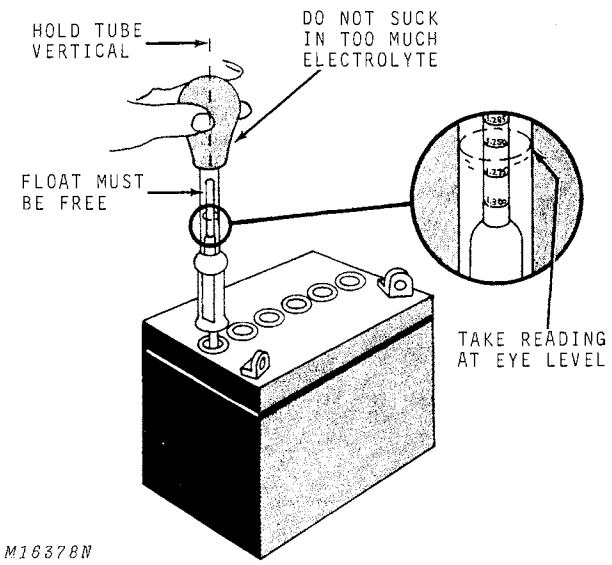


M16377/1197/4020C/250981

To determine a corrected specific gravity reading when the temperature of the electrolyte is other than (27°C) 80°F: Add to the hydrometer reading four gravity points (0.004) for each (12°C) 10° above (27°C) 80°F. Subtract four gravity points (0.004) for each (12°C) 10° below (27°C) 80°F.

Test specific gravity of each cell. Make sure hydrometer float is suspended freely in the liquid and reading is taken at eye level.

Use battery test procedure.



M16378/1197/4020D/250981

BATTERY TEST PROCEDURE

STEP-1

VISUAL INSPECTION
CHECK FOR OBVIOUS DAMAGE SUCH AS CRACKED OR BROKEN CASE THAT SHOWS LOSS OF ELECTROLYTE, TERMINAL DAMAGE

- OBVIOUS DAMAGE → REPLACE BATTERY
- NO OBVIOUS DAMAGE → CHECK ELECTROLYTE LEVEL
  - BELOW TOP OF PLATES IN ONE OR MORE CELLS → ADD WATER TO PROPER LEVEL. CHARGE FOR 30 MIN. @ 7 AMPS. INITIAL CHARGE (5 AMPS. AFTER INITIAL CHARGE) WITH VENT CAPS REMOVED. LEAVE SAFETY VENT CAPS IN PLACE—PROCEED TO STEP-2
  - ELECTROLYTE LEVEL 1/4 TO 1/2 INCH (6.35 TO 12.70 mm) ABOVE TOP OF PLATES IN ALL CELLS - PROCEED TO STEP 2.

STEP-2

HYDROMETER TEST

- 50 POINTS OR MORE VARIATION BETWEEN HIGHEST AND LOWEST CELL → RECHARGE BATTERY. IF 50 POINTS VARIATION PERSISTS, REPLACE BATTERY
- LESS THAN 50 POINTS VARIATION BETWEEN HIGHEST AND LOWEST CELL
  - SPECIFIC GRAVITY BELOW 1.225* → **CHARGE UNTIL ALL CELLS ARE AT LEAST 1.225 → PROCEED TO STEP-3
  - SPECIFIC GRAVITY 1.225 OR ABOVE → PROCEED TO STEP-3

**IF UNABLE TO OBTAIN SPECIFIC GRAVITY OF 1.225 @ 80°F (27°C) IN ALL CELLS—REPLACE BATTERY

STEP-3

LOAD TEST

1. ATTACH TESTER CLAMPS TO BATTERY TERMINALS IN CORRECT POLARITY (USUALLY RED TO POSITIVE (+) AND BLACK TO NEGATIVE (−). FOLLOW TESTER MFG. INSTRUCTIONS. ON STUD TERMINALS, BE SURE TO CONNECT TESTER LEAD TO HEAVY LUG SECTION NOT TO STUDS.
2. SET SELECTOR SWITCH ON LOAD TESTER TO 1/2 CRANKING AMP. RATING @ 0°F (−18°C) OF BATTERY.
3. APPLY LOAD FOR 15 SECONDS, AND READ LOAD TESTER JUST BEFORE RELEASING THE LOAD.

- VOLTAGE BELOW CHART VALUE → REPLACE
- VOLTAGE EQUAL TO OR ABOVE CHART VALUE—RETURN TO SERVICE

VOLTAGE CHART

ESTIMATED ELECTROLYTE TEMPERATURE		MINIMUM REQUIRED VOLTAGE UNDER 15 SEC. LOAD
70°F	(21°C) & ABOVE	9.6
60°F	(16°C)	9.5
50°F	(10°C)	9.4
40°F	(4°C)	9.3
30°F	(−1°C)	9.1
20°F	(−7°C)	8.9
10°F	(−12°C)	8.7
0°F	(−18°C)	8.5

DANGER

Batteries produce EXPLOSIVE GASES. Keep sparks, flame, cigarettes away. Ventilate when charging or using in enclosed space. Batteries contain SULFURIC ACID which causes severe burns. If acid contacts eyes, skin or clothing, flush well with water. For contact with eyes get immediate medical attention. KEEP AWAY FROM CHILDREN.

1197/4020E/000981

TEST BATTERY HIGH-RATE DISCHARGE

Test high-rate discharge to make sure the battery can deliver current under load.

Connect the high-rate discharge tester (A) to the battery (B) and follow the manufacturer's instructions.

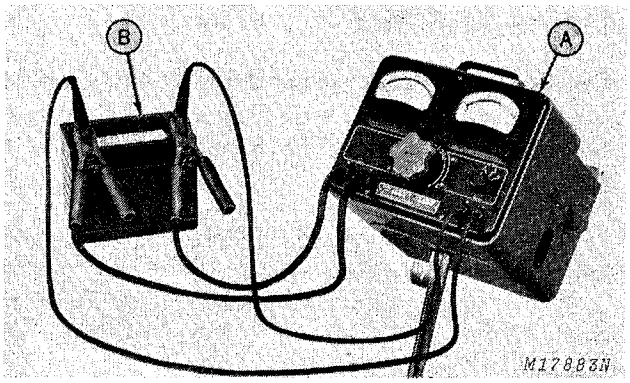
Discharge the battery under a fixed load, at three times the ampere-hour rating, for approximately 20 seconds, then read the terminal voltage.

If the battery is in satisfactory condition, the terminal voltage reading should remain above 9 volts.

If the terminal voltage falls below this value, the battery is defective or it is not fully charged.

To be sure of the battery condition, carefully charge it and repeat the test.

Replace the battery if it is defective.



A—High-RateDischarge Tester **B—Battery**

M17883/1197/4020F/250981

SERVICE BATTERY

Good battery servicing in the snowmobile should include the following 8 items.

1. Clean battery.
2. Inspect cables including ground connections.
3. Clean terminals.
4. Inspect hold-downs.
5. Inspect case for leaks.
6. Make hydrometer test.
7. Add water if necessary. Use caution to protect snowmobile from electrolyte damage.
8. Recharge battery if less than 75 percent charged.

1197/4020G/000981

CLEAN BATTERY

Corrosion around the battery terminals is normal. However, an accumulation of corrosion over a long period can shorten the life of the battery. Keep battery terminals as clean as possible.

To clean terminals, remove battery from snowmobile. Remove all corrosion using a wire brush. Wash terminals using a solution of one part ordinary baking soda to four parts water. Do not permit cleaning solution to enter battery cells. Flush battery with clear water.

Wash entire battery case, battery base, and hold-down strap with clear water. Do not get water on switches and wiring connections.

Coat terminals with petroleum jelly or a light film of oil to protect against corrosion.

When installing battery, connect cable to positive terminal first. Be sure to slide rubber boot down on cable until terminal and clamp are completely covered.

1197/4020H/000981

ACTIVATE NEW BATTERY

Activate a new battery before installing it in snowmobile. This will prevent damage to machine in case electrolyte spills.

Add electrolyte until plates are just covered. Leave cell caps off while charging. Charge at 7 amps for 30 minutes. After initial charge, do not charge battery at more than 5 amps.

Charging the battery will increase battery temperature and raise the electrolyte level. If electrolyte is still below the ring in the battery neck, add enough electrolyte to fill to the bottom of the ring.

Add water as required. A healthy battery will consume about one teaspoon of water per cell each month.

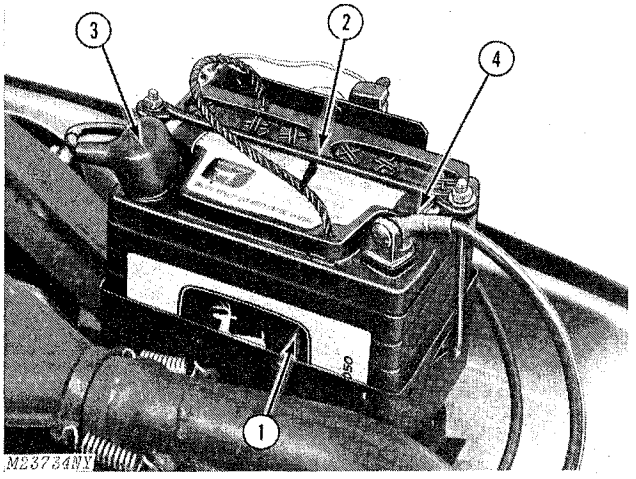
CAUTION: While charging battery, hydrogen and oxygen gases are emitted which are very explosive. Therefore, keep open flames and sparks away from battery.

CAUTION: Battery electrolyte is poisonous and can be injurious to eyes, skin and clothing. Handle it carefully.

1197/4020I/000981

INSTALL BATTERY

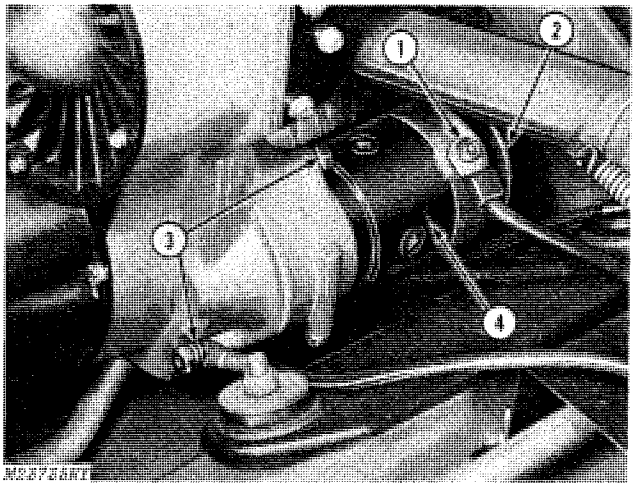
1. Set battery in box.
2. Install battery hold-down.
3. Connect positive (+) battery cable and cover terminal with boot.
4. Connect negative (−) battery cable.



M23734/1197/4020J/250981

REMOVE STARTER MOTOR

1. Disconnect starter motor cable.
2. Remove screws attaching bracket to engine.
3. Remove starter motor hardware.
4. Remove starter motor.

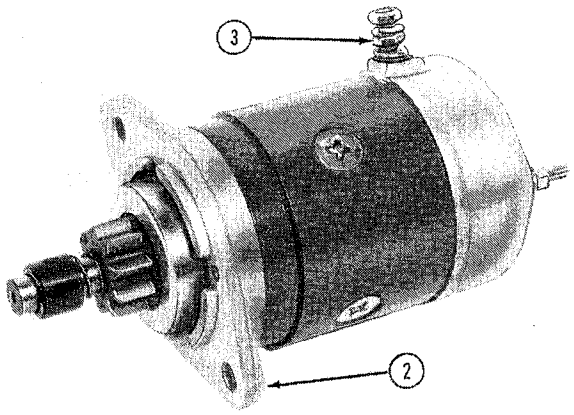


M23735/1197/4020K/250981

TEST STARTER MOTOR DRIVE

1. Connect jumper cables to a 12-volt battery.
2. Connect negative cable to starter motor housing.
3. Touch positive cable to starter motor terminal.

Starter motor pinion should move freely up the clutch and come back when positive cable is removed. If not, disassemble starter motor drive and inspect it for dirt or damage.



M23736NY

M23736/1197/4020L/250981

TEST ARMATURE ROTATION

Rotate armature by hand. If it does not rotate freely, disassemble and inspect starter motor for a bent armature or badly worn bearings.

1197/4020M/000981

REPAIR STARTER MOTOR DRIVE

1. Use a socket of the proper size and tap the collar down below retaining ring.

2. Remove retaining ring.

3. Remove collar and spring.

4. Thread pinion off the shaft.

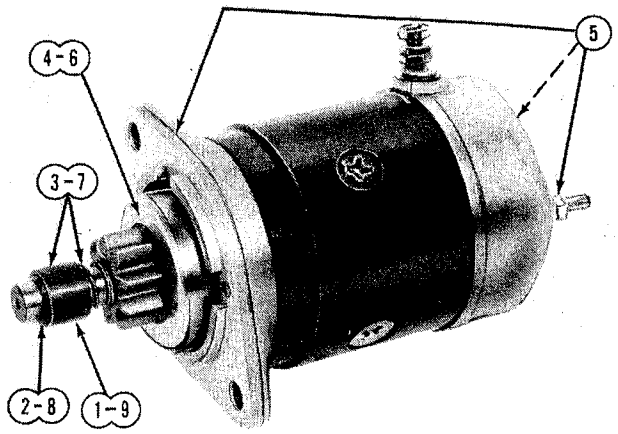
5. Front cover can be replaced by removing the thru-bolts.

6. Thread pinion onto shaft.

7. Install spring and collar.

8. Install retaining ring.

9. Place an adjustable wrench under collar and tap armature shaft lightly with a plastic mallet to lock collar over ring.



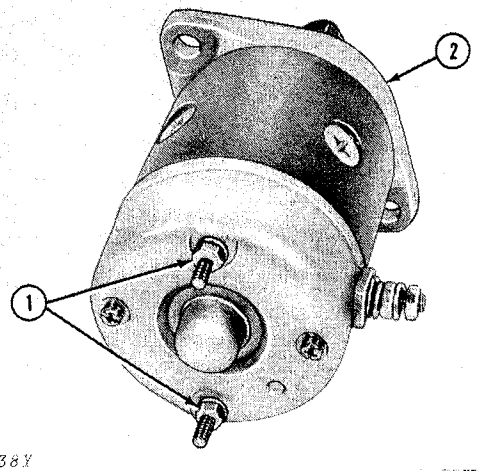
M23737NY

M23737/1197/4020N/250981

REPAIR STARTER MOTOR

1. Remove thru-bolts.

2. Pull armature out of housing.



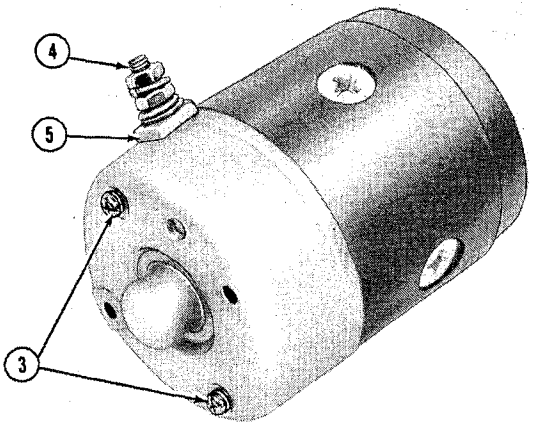
M23738Y

M23738/1197/4020O/250981

3. Remove rear cover screws.

4. Remove hardware from stud and sealer from plastic holder.

5. Hold the plastic holder while you remove gear cover.



M23739Y

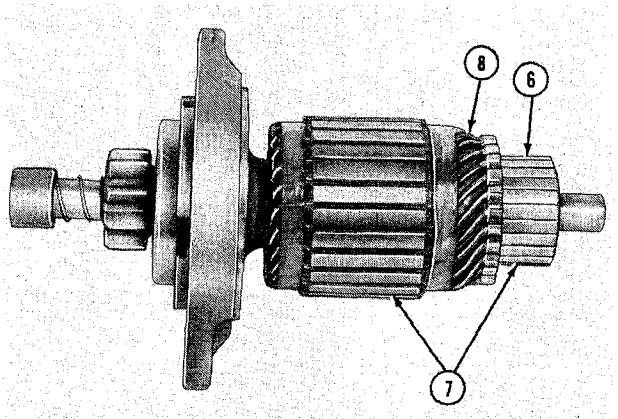
M23739/1197/4020P/250981

6. Inspect armature commutator bar for burned spots and brush dirt or copper between the bars which would indicate a short.

7. Connect a test light between commutator and conductor. If the test light lights, the armature is grounded.

8. Inspect all leads between the conductor and commutator for damage. Bad connections can cause the armature to arc and burn.

If armature is defective, replace starter motor.

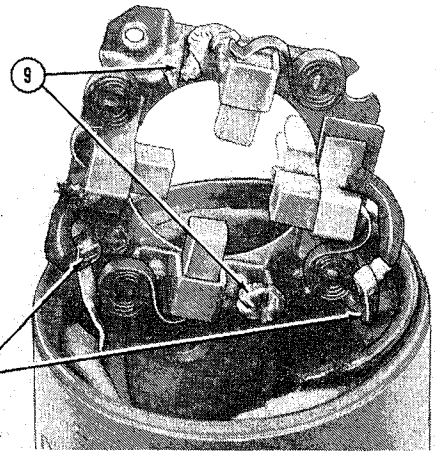


M23740Y

M23740/1197/4020Q/250981

9. Replace negative brushes by heating the connection to disconnect the lead. Solder a new brush to the holder.

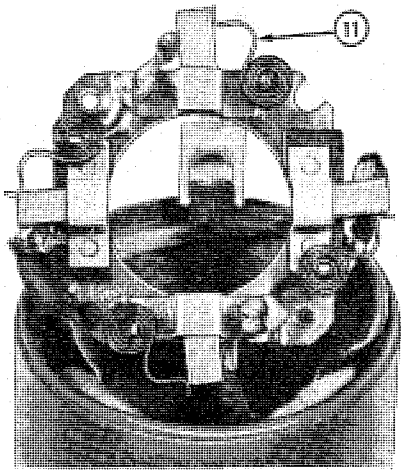
10. Replace positive brushes by heating the connection and uncrimping the field lead. Crimp and solder the new brush lead to the field lead.



M23741Y

M23741/1197/4020R/250981

11. Position brushes in holder so that the springs hold them out as shown.



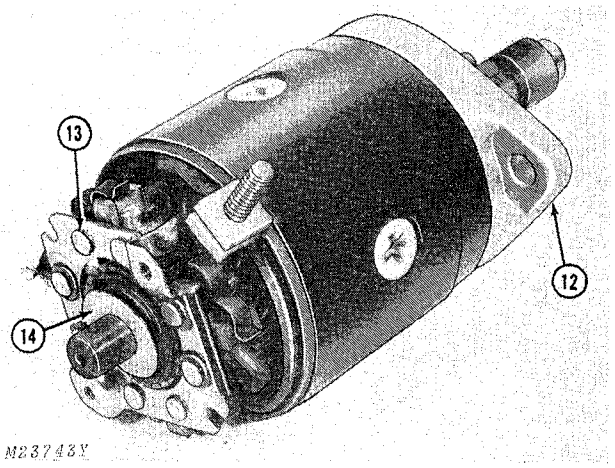
M23742Y

M23742/1197/4020S/250981

12. Install armature in housing and rotate front cover until it snaps into position.

13. Position brush holder over armature core and release brush springs.

14. Place washers over armature shaft.

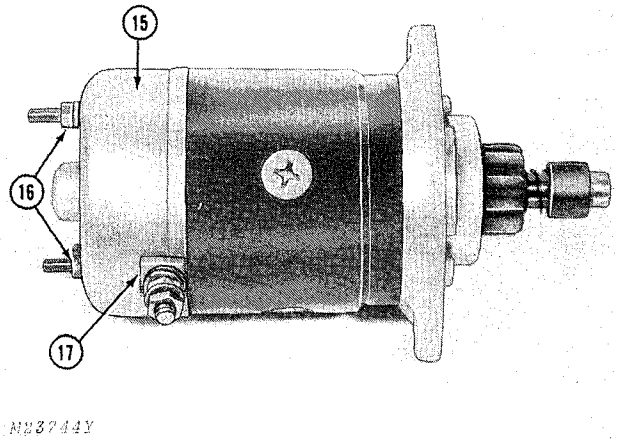


M23743/1197/4020T/250981

15. Install rear cover and screws.

16. Install thru-bolts.

17. Seal plastic holder with epoxy and install hardware.



M23744/1197/4020U/250981

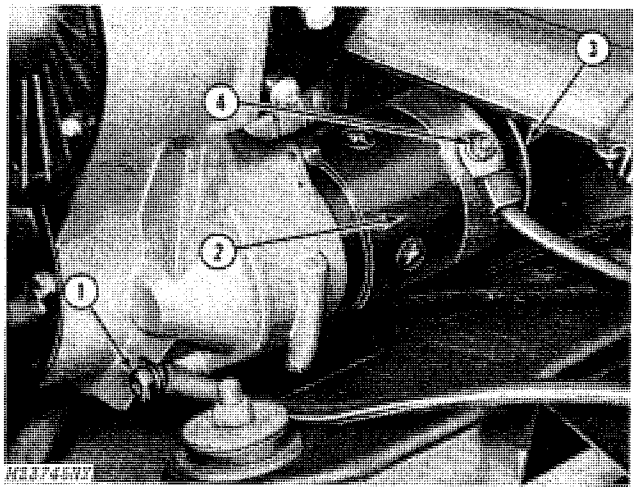
INSTALL STARTER MOTOR

1. Install motor on upper stud. Install flat washer and lock nut but do not tighten.

2. Install lower bolt with head of bolt to the inside. Install ground lead on lower bolt. Secure with flat washer, lock washer and lock nut. Do not tighten.

3. Secure starter motor bracket to engine with cap screws, flat washers and lock washers. Tighten all hardware in Steps 1 thru 3.

4. Connect starter motor cable to starter motor.



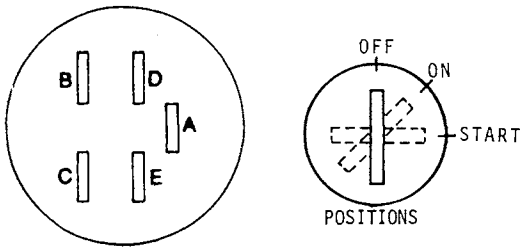
M23745/1197/4020V/250981

5. Remove connector from key switch.

6. Connect test light between terminals as shown in chart below. Test light should light on the closed terminals in the position called out.

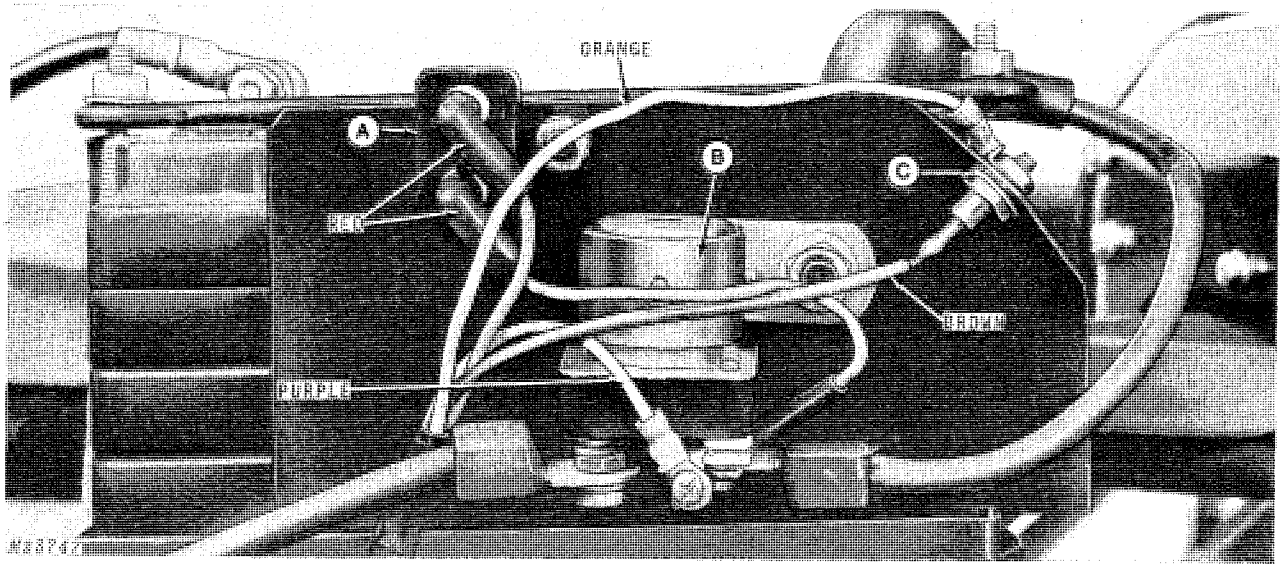
POSITION	CLOSED	OPEN
OFF	A & B	D,C,E
RUN	C & D	A,B,E
START	D & E	A,C,B

If test light shows incorrectly, replace the key switch following the wiring diagram.

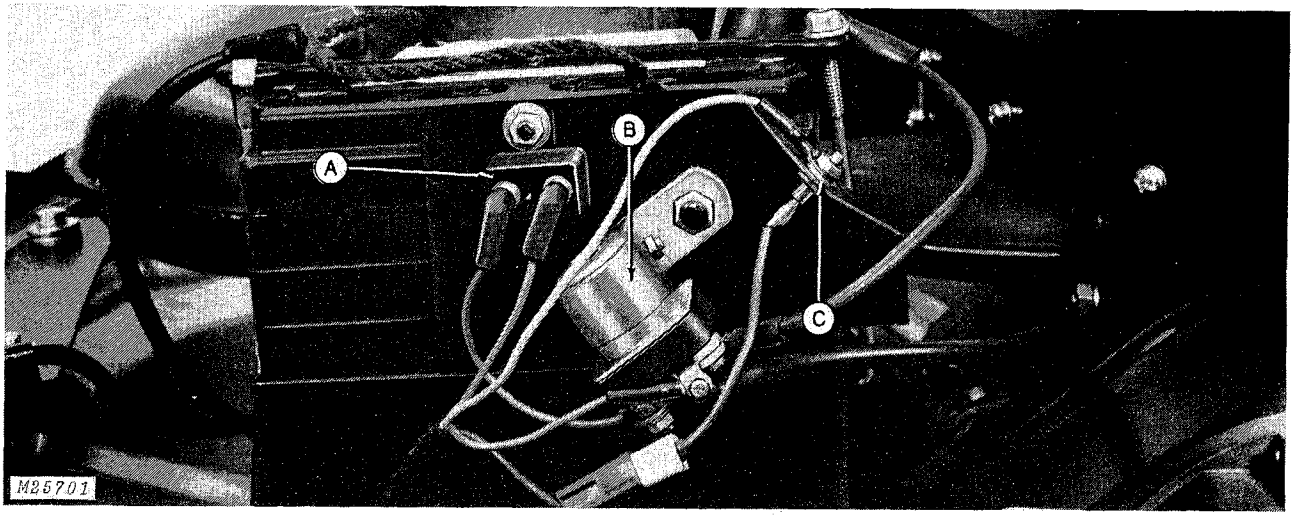


M23746

M23746/1197/4020W/250981



Serial No. (95,001-120,000)



Serial No. (120,001-)

A—Circuit Breaker **B—Solenoid** **C—Rectifier**

TESTS

1. Connect a flashlight tester between terminals of circuit breaker (A). Test light should light. If not, replace the circuit breaker.

IMPORTANT: Circuit breakers must be installed so that the "BAT" terminal is connected to the lead coming from the solenoid.

2. Remove starter motor cable from solenoid (B).

3. Connect a flashlight tester between the two large solenoid terminals.

4. Connect a jumper cable between battery positive (+) terminal and solenoid small terminal. Solenoid should snap and light the test light until jumper cable is removed. If not, replace the solenoid.

5. Connect the black flashlight tester lead to the brown lead side of rectifier and the red tester lead to the orange lead side of rectifier (C). Test light should light in this position and not light if leads are reversed. If not, replace the rectifier.

M23747 M25701/1197/4020X/250981

ELECTRICAL SYSTEM SPECIFICATIONS

Item	Specification
Spark Plug*	QN-3
Ignition	Kokusan CDI
Timing	Align Timing Marks

*Spark plugs are gapped at (0.635 mm) 0.025 inch at the factory. Do not regap plugs. When plug gap reaches (1.143 mm) 0.045 inch, replace the plugs.

1197/4025A/300981

12-VOLT LIGHT BULB CHART

Location	John Deere Part Number
Head Light	
Serial No. (-190,000)	AM52959
Serial No. (190,001-)	AM53887
Brake-Taillight	AM52619
Speedometer	AM52847
Tachometer	AM52847

1197/4025B/300981

TORQUE SPECIFICATIONS

Item	Torque
Flywheel Nut	(81.3 N·m) 60 ft-lbs

1197/4025C/300981

Section 50
POWER TRAIN

CONTENTS

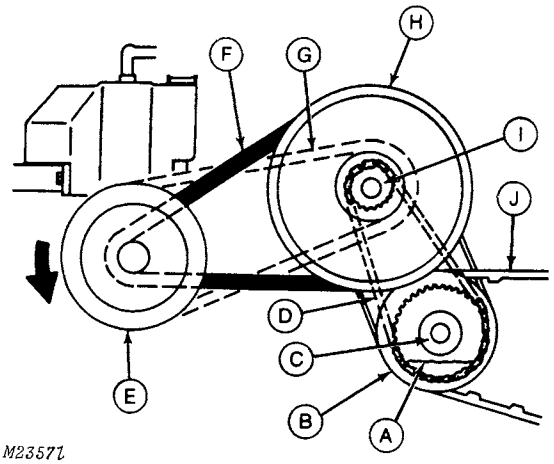
1197/5005A/240981

PRINCIPLE OF OPERATION

The power train for 340 and 440 Trailfire Snowmobiles consists of a drive sheave (E), drive belt (F), driven sheave (H), disk brake, secondary shaft (I), chain case (B), sprockets, drive chain (D), and drive shaft (C).

The drive sheave is mounted on the engine crankshaft and functions as a centrifugally-operated clutch and variator.

When stopped or at idle speed, the sides of the sheave do not contact the drive belt, thus providing a de-clutched position.



M23571

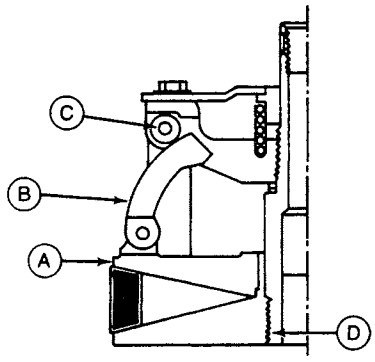
A—Oil Level
B—Chain Case
C—Track Drive Shaft
D—Drive Chain
E—Drive Sheave
F—Drive Belt (Low-Speed Position)
G—Drive Belt (High-Speed Position)
H—Driven Sheave
I —Secondary Shaft
J —Track

M23571/1197/5005B/240981

JOHN DEERE (COMET)
102C DRIVE SHEAVE

Increasing engine speed causes the centrifugally-actuated arms (B) in the movable face (A) to swing out against the spider rollers (C) on the fixed face (D). This action forces the sheave halves together, engaging the drive belt with the sheave and starts the snowmobile moving.

A—Movable Face
B—Arms
C—Spider Rollers
D—Fixed Face



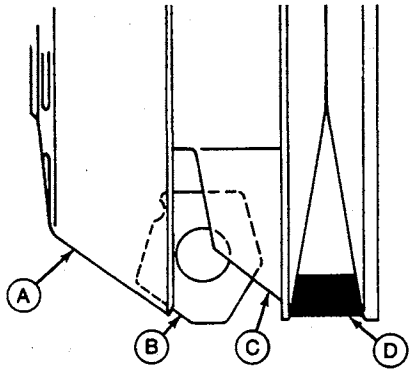
M23572

M23572/1197/5005C/240981

JOHN DEERE (COMET)
94C DRIVE SHEAVE

Increasing engine speed causes the centrifugally-actuated wedges (B) in the movable face (C) to move out against the cover (A). This action forces the sheave halves together, engaging the drive belt (D) with the sheave.

When the engine reaches top rpm, the 102C and 94C sheave halves are as close together as possible. The drive belt continues to ride out as engine speed increases and the sheave halves come together. This action provides a smooth transition from slow to fast snowmobile travel speed.



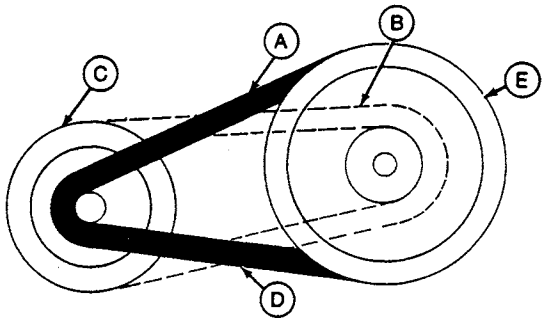
M22571

A—Cover
B—Wedges
C—Movable Face
D—Drive Belt

M22571/1197/5005D/240981

JOHN DEERE DRIVEN SHEAVE

The drive sheave (C) is spring-loaded in the low-speed position (A). Increased speed causes the drive belt (D) to ride out on the drive sheave (C). The driven sheave (E) opens against spring tension, allowing the drive belt to ride deeper in the driven sheave (E).



A—Low-Speed Position
B—High-Speed Position
C—Drive Sheave
D—Drive Belt
E—Driven Sheave

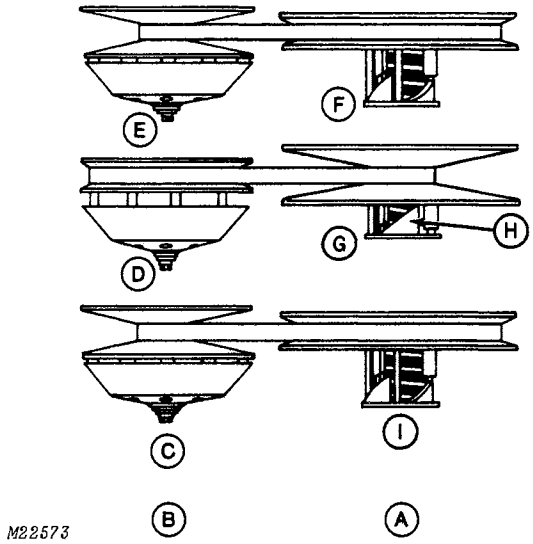
M19245/1197/5005E/240981

The driven sheave (A) does more than act as a take-up for the action of the drive sheave. The driven sheave is also "torque-sensitive". The driven sheave rides on the cam bracket (H) as it opens to obtain high-speed position.

Normal rotational force on the cam bracket (H) works to keep the driven sheave in the low speed position (F).

If an increased load or high torque requirement occurs (such as climbing a steep hill) after the snowmobile is up to speed, the cam bracket (H) in the driven sheave forces the sheave halves together, obtaining a slower travel speed (I) while maintaining high engine rpm (C) for increased torque.

The top and bottom drawings have the same drive belt position. Increased speed of the engine in the lower drawing, causes a difference in the output speed of the driven sheave.



M22573

A—Driven Sheave
B—Drive Sheave
C—High Engine rpm
D—High Engine rpm
E—Low Engine rpm
F—Low Speed Position
G—High Output Speed
H—Cam Bracket
I —Medium Output Speed

M22573/1197/5005F/240981

CHAIN CASE AND DRIVE CHAIN

The fully-enclosed chain case consists of a silent chain, two sprockets and spring-loaded tensioner. The chain and sprockets are oil-bath lubricated.

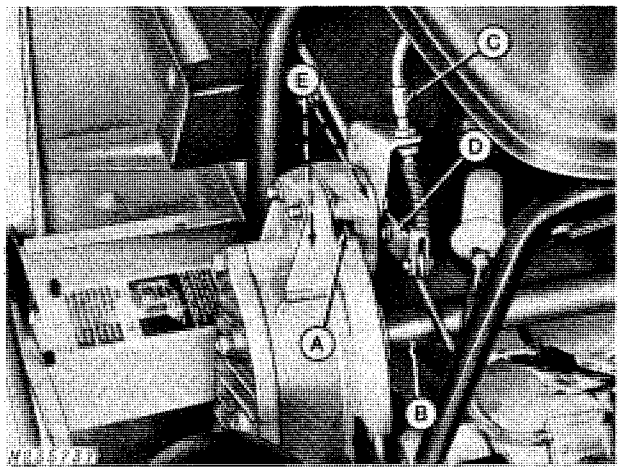
The spring-loaded tensioner maintains proper chain tension when both accelerating and decelerating. No chain tension adjustment is necessary.

1197/5005G/240981

BRAKES

The mechanical disk brake (A) operates on the drive shaft (B) and is actuated by the brake cable (C). When the brake is applied, the cam on the brake arm (D) moves two pins in against the brake puck (E). The puck moves the brake disk (A) against a second puck for braking.

A—Disk Brake
B—Drive Shaft
C—Brake Cable
D—Brake Arm
E—Brake Puck



M23573/1197/5005H/240981

DIAGNOSE MALFUNCTIONS

Drive Sheave Clutching at Too Low rpm

Spring weak or broken.
Inspect clutch wedges (94C).
Inspect roller arm weights (102C).

Drive Sheave Clutching at Too High rpm

Wrong spring (102C or 94C).
Drive sheave dirty internally.
Worn spider buttons (102C).

Drive Clutch Sticking

Belt mold builds up on center post and movable face cannot slide properly.

Erratic Shifting

Oil or grease on drive or driven sheaves.

Drive Belt Not Operating Smoothly in Drive Sheave

Sheave faces rough, grooved, pitted or scored.
Drive belt defective.

Driven Sheave Not Opening Properly

Ramp buttons worn.
Ramp on movable face damaged.
Movable sheave half binding on fixed half.
Incorrect spring.
Spring tensioned improperly.

Driven Sheave Opening Too Easily

Spring weak or broken.
Spring pretensioned improperly.

Uneven Belt Wear

Sheaves misaligned.
Engine mounts loose.

Drive Belt Glazed

Excessive slippage.
Oil on sheave surfaces.

Belt Worn Narrow in One Section

Excessive slippage caused by stuck track.

Belt Too Tight at Idle Speed

Engine idle set too fast.
Incorrect distance between sheaves.
Incorrect belt length.

Belt Edge Cord Breakage

Sheaves misaligned.

Brake Not Holding Properly

Brake cable out of adjustment.
Brake pucks worn.
Brake pucks oil-saturated.
Key sheared on brake disk.

Brake Not Releasing Properly

Return spring weak or broken.
Brake lever bent or damaged causing binding.

Chain Case Leaking

Gaskets on drive shaft bearing flangettes or secondary shaft bearing flangettes damaged.
O-ring on drive shaft or secondary shaft bearings damaged.
Chain case cracked or broken.

Rapid Chain and Sprocket Wear

Insufficient oil in chain case.
Sprockets out of alignment due to improper assembly.
Chain tension spring broken.

1197/5005I/240981

LOW AND HIGH ELEVATION APPLICATIONS

To obtain and provide proper governed engine speed proceed as follows:

1. Be sure correct clutching is used for altitude at which the snowmobile will operate.

2. Change carburetor jets and settings as required. See Section 30, Group 10.

1197/5005J

CLUTCHING RECOMMENDATIONS - 340 TRAILFIRE (SERIAL NO. 95,001-120,000) - 94C CLUTCH (BLACK COVER)*

			Primary Clutch			Secondary Clutch		Chain Case	
Altitude	Clutch Engagement (rpm)	Governed Speed (rpm)	Number of Weights	Hole Size	Spring	Spring Position	Cam	Gearing Sprockets	Chain (Pitch)
Sea Level to (0 to 914 m) 3000 Ft	4000 to 4300	6000 to 6500	9	7/8″	White	No. 2	44°	21 Tooth** 39 Tooth**	66
(914 to 1 828 m) 3000 to 6000 Ft.	4000 to 4300	6000 to 6500	6 3	7/8″ 1″	White	No. 2	44°	17 Tooth 35 Tooth	62
Above (1 828 m) 6000 Ft.	4000 to 4300	6000 to 6500	3 6	7/8″ 1″	White	No. 2	44°	17 Tooth 35 Tooth	62

**Some 340 Trailfire Snowmobiles (Serial No. 95,001-120,000) have been changed to either a 94C Clutch with a silver cover or a 102C Clutch under Modification Program M906. The factory installed clutch was a 94C with a black cover.*

***Factory Installed*

1197/5005K/240981

CLUTCHING RECOMMENDATIONS - 340 TRAILFIRE (SERIAL NO. 95,001-120,000) - 94C CLUTCH (SILVER COVER)

			Primary Clutch			Secondary Clutch		Chain Case	
Altitude	Clutch Engagement (rpm)	Governed Speed (rpm)	Number of Weights	Hole Size	Spring	Spring Position	Cam	Gearing Sprockets	Chain (Pitch)
Sea Level to (0 to 914 m) 3000 Ft.	3200 to 3500	6000 to 6500	9	3/4″	White	No. 2	44°	21 Tooth* 39 Tooth*	66
(914 to 1 828 m) 3000 to 6000 Ft.	3300 to 3600	6000 to 6500	6 3	3/4″ 7/8″	White	No. 2	44°	17 Tooth 35 Tooth	62
Above (1 828 m) 6000 Ft.	3400 to 3700	6000 to 6500	9	7/8″	White	No. 2	44°	17 Tooth 35 Tooth	62

**Factory Installed*

GEARS

17 Tooth Gear - M66302
21 Tooth Gear - M66121
35 Tooth Gear - M65809
39 Tooth Gear - M65693

GEAR RATIOS

1.86:1 with 21 and 39 Tooth Gears and 66 Pitch Chain
2.06:1 with 17 and 35 Tooth Gears and 62 Pitch Chain

CHAIN

62 Pitch Chain - M66123
66 Pitch Chain - M66122

PRIMARY CLUTCH KITS (WEDGES)

AM54937 Kit - contains nine 7/8-inch wedges.

NOTE: Use wedges from each kit to obtain the correct combination for altitudes of (914 to 1 828 m) 3000 to 6000 feet.

1197/5005L/000981

CLUTCHING RECOMMENDATIONS - 340 TRAILFIRE - 102C CLUTCH

			Primary Clutch			Secondary Clutch		Chain Case	
Altitude	Clutch Engagement (rpm)	Governed Speed (rpm)	Spacers in Clutch	Clutch Spring	Arm Kit	Spring Position	Cam	Gearing Sprockets	Chain (Pitch)
Sea Level to (0 to 1 219 m) 4000 Ft.	3600 to 3800	6200 to 6700	2	Silver	AM55159	No. 2	38°	17 Tooth* 35 Tooth*	62
(1 219 m) 4000 Ft. and Up	4300 to 4500	6200 to 6700	2	Silver	AM54287	No. 2	Compound AM55127	17 Tooth 35 Tooth	62

**Factory Installed*

CLUTCHING RECOMMENDATIONS - 440 TRAILFIRE AND TRAILFIRE LX - 102C CLUTCH

			Primary Clutch			Secondary Clutch		Chain Case	
Altitude	Clutch Engagement (Rpm)	Governed Speed (rpm)	Spacers in Clutch	Clutch Spring	Arm Kit	Spring Position	Cam	Gearing Sprockets	Chain (Pitch)
Sea Level to (0 to 1 219 m) 4000 Ft.	3600 to 3800	6200 to 6700	2	Silver	Am54281	No. 2	44°	21 Tooth* 39 Tooth*	66
(1 219 mm) 4000 Ft. and Up	3700 to 3900	6200 to 6700	2	Silver	AM54920	No. 2	44°	21 Tooth 39 Tooth	66

**Factory Installed*

1197/5005M/000981

GEARS

17 Tooth Gear - M66302
21 Tooth Gear - M66121
22 Tooth Gear - M67665
24 Tooth Gear - M66322
25 Tooth Gear - M67970
35 Tooth Gear - M65809
38 Tooth Gear - M67898
39 Tooth Gear - M65693
40 Tooth Gear - M66323
42 Tooth Gear - M65810

GEAR RATIOS

1.56:1 with 25 and 39 Tooth Gears and 68 Pitch Chain
1.67:1 with 24 and 40 Tooth Gears and 68 Pitch Chain
1.72:1 with 22 and 38 Tooth Gears and 66 Pitch Chain
1.86:1 with 21 and 39 Tooth Gears and 66 Pitch Chain
2.06:1 with 17 and 35 Tooth Gears and 62 Pitch Chain
2.47:1 with 17 and 42 Tooth Gears and 66 Pitch Chain

CHAIN

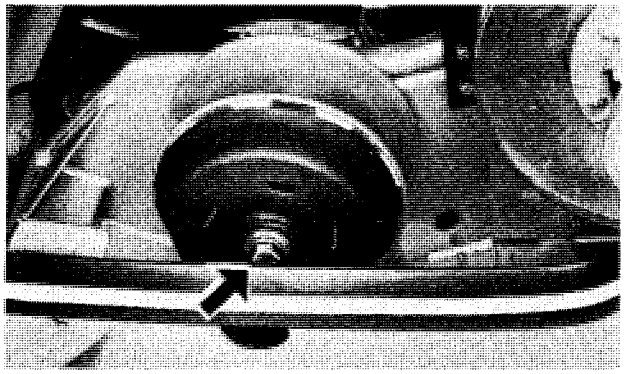
62 Pitch Chain - M66123
66 Pitch Chian - M66122
68 Pitch Chain - M66321

1197/5005N/000981

REMOVE DRIVE SHEAVE

1. Remove drive belt.

2. Remove retaining screw and washer.

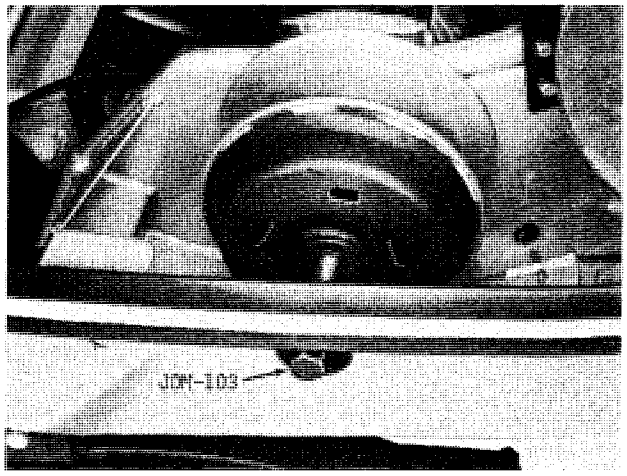


M23574/1197/5010A/000981

3. Screw JDM-103 Puller into sheave hub until sheave comes loose from the crankshaft.

NOTE: Use an impact wrench or 1/2-inch socket wrench with long handle to remove retaining screw and to install JDM-103 Puller.

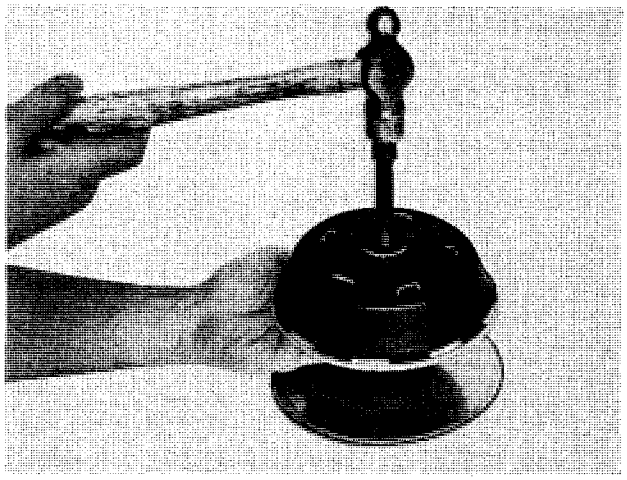
4. Remove JDM-103 Puller from drive sheave and remove sheave.



M23575/1197/5010B/000981

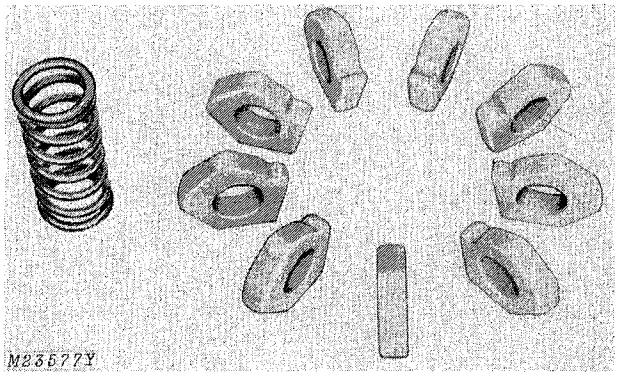
DISASSEMBLE DRIVE SHEAVE

1. Install JDM-103 Puller in drive sheave.
2. Hold the sheave as shown and strike puller with a hammer.
3. Remove JDM-103 Puller.



M23576/1197/5010C/000981

4. Remove spring and 9 wedges.



M23577/1197/5010D/000981

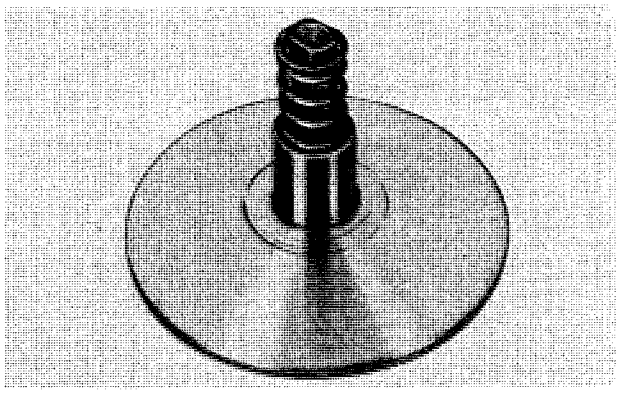
INSPECT AND REPAIR DRIVE SHEAVE

1. If bushings in movable face are worn or damaged, replace movable face. Bushings are not serviceable.
2. Check sheave faces for pitting or wear and replace as necessary.
3. Check spring and wedges for wear and replace as necessary.

1197/5010E/000981

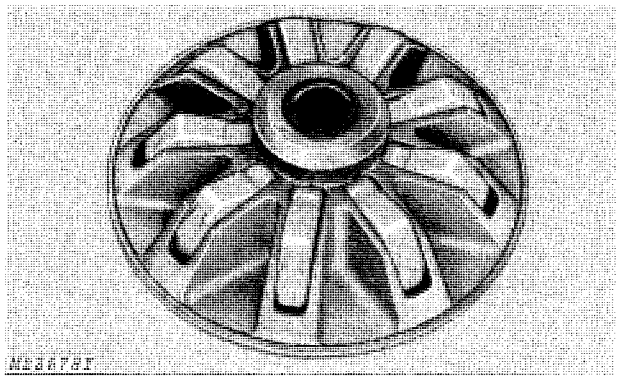
ASSEMBLE DRIVE SHEAVE

1. Install spring over hub of fixed face.



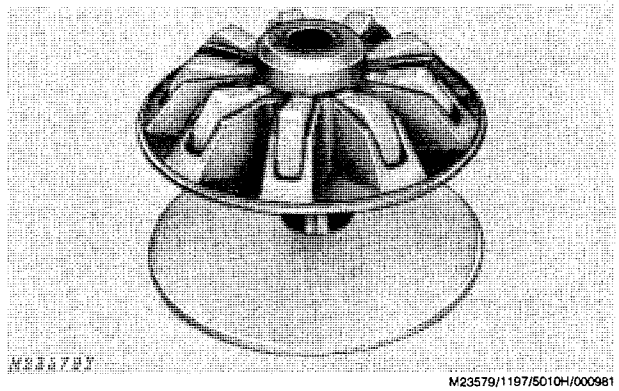
M22579/1197/5010F/000981

2. Install wedges in movable face with notch on wedge up toward the center.



M23578/1197/5010G/000981

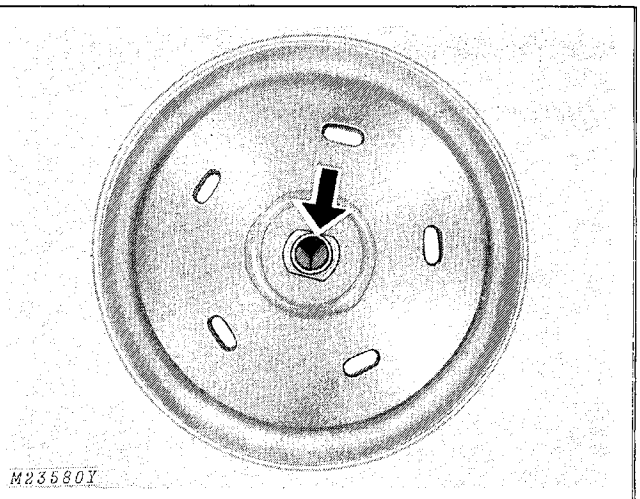
3. Place movable face over fixed face hub and spring.



M23579/1197/5010H/000981

4. Place cover over movable face. Line up flats of the cover with flats of the post. Use your hands and press down on cover until it is retained on the post.

NOTE: Cover will be forced into place by the retaining bolt when clutch is installed on crankshaft.



M23580/1197/5010I/000981

INSTALL DRIVE SHEAVE

1. Install drive sheave on crankshaft.

2. Install retaining cap screw and washer. Torque retaining cap screw to (68 N·m) 50 ft-lbs.

NOTE: Pull on recoil start rope until dogs engage. Hold rope firmly while torquing retaining cap screw.

3. Install drive belt.

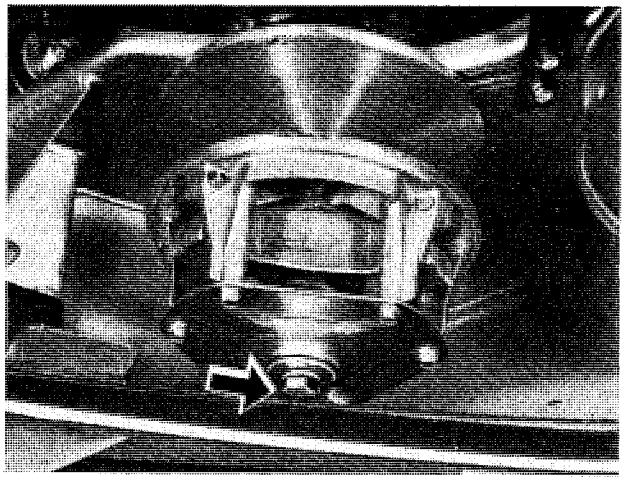
NOTE: Always install drive belt so number on belt can be read when viewed from the left side.

1197/5010J/000981

REMOVE DRIVE SHEAVE

1. Remove drive belt and knock-out plug from side of pan.

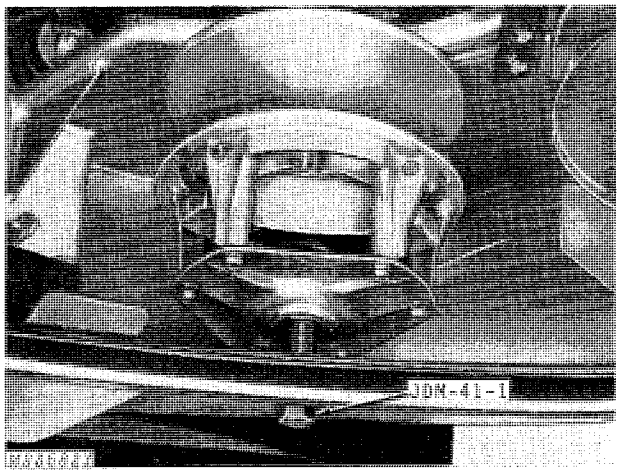
2. Remove retaining screw and washer.



M23581/1197/5015A/000981

3. Screw JDM-41-1 Puller into sheave hub until sheave comes loose from the crankshaft.

NOTE: Use an impact wrench or 1/2-inch socket wrench with long handle to remove retaining screw and to install JDM-41-1 Puller.



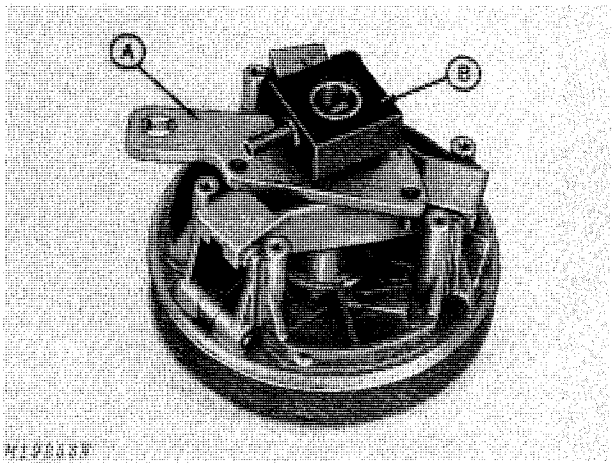
M23582/1197/5015B/000981

DISASSEMBLE DRIVE SHEAVE

1. Remove every other screw from cover plate.
2. Remove three remaining cap screws equally.
3. Remove cover plate and spring.

1197/5015C/000981

4. Install JDM-41-3 Spider Tool (A) over hub.
5. Install JDM-41-5 Hub Lock Tool (B) over hub with pin of tool through cross hole in hub.

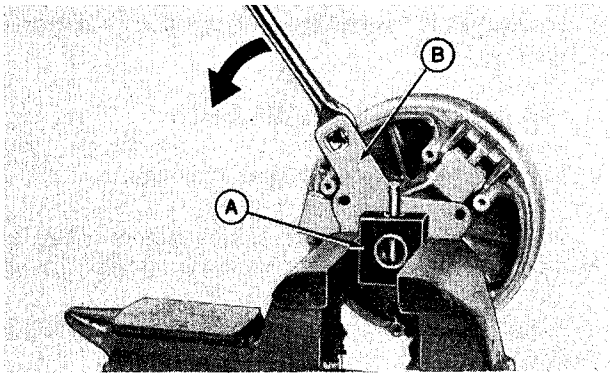


M19253/1197/5015D/000981

6. Clamp assembly securely in vise. Install 1/2-inch socket wrench with long handle in Spider Tool (B). Turn counter-clockwise to loosen spider from hub.

7. Remove Hub Lock Tool (A) and Spider Tool (B). Turn spider off hub.

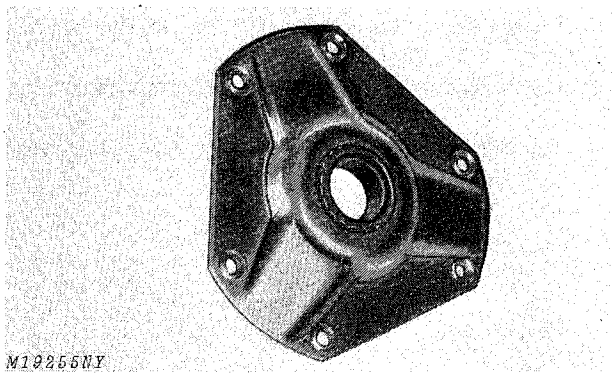
NOTE: Remove spacer rings and movable face. Note spacers for reassembly.



M19254/1197/5015E/000981

INSPECT AND REPAIR DRIVE SHEAVE

1. If bushing in cover plate, is worn or damaged, replace cover plate. Bushing is not serviceable.



M19255/1197/5015F/000981

2. Inspect guide buttons (A) and rollers (E) in spider. Replace if necessary.

3. Use pliers to remove guide buttons.

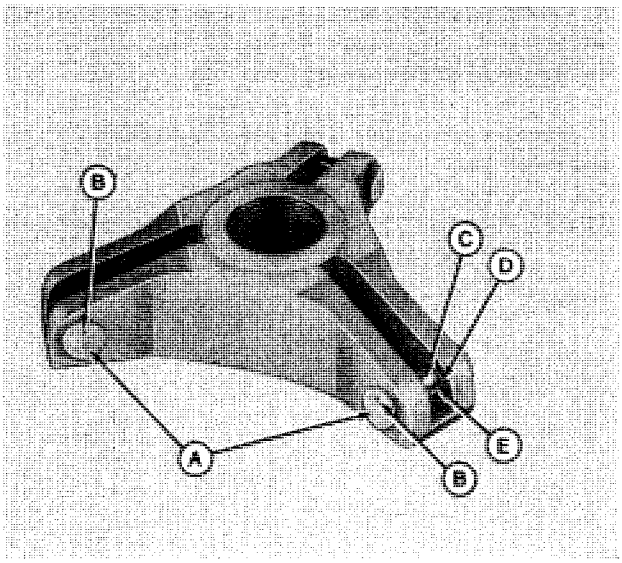
4. Remove pin, roller and three washers.

5. Install roller in spider with a steel washer (C) on each side of roller. Fiber washer (D) should be installed as shown.

6. Install pin and guide buttons (A). Tap buttons gently until seated.

IMPORTANT: Position small dot (B) on guide buttons (A) straight up or straight down. This matches bearing surface of guide button to bearing surface of movable face.

A—Guide Button
B—Dot
C—Steel Washers
D—Fiber Washer
E—Roller

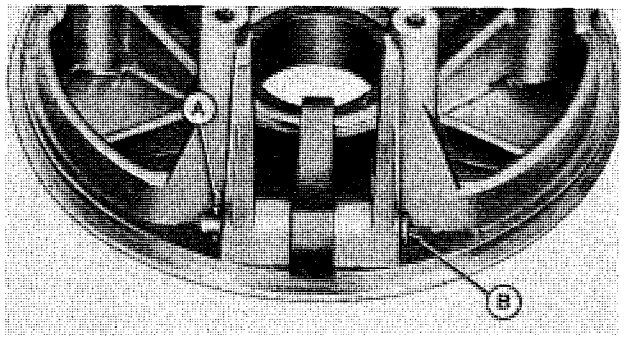


M29506/1197/5015G/000981

7. Inspect roller arms for wear and replace as necessary.

8. Use side cutters to remove spring pin (A).

9. Remove pivot pin (B), roller and three steel washers.

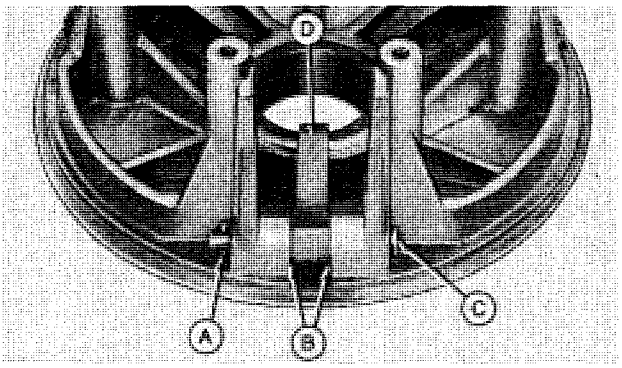


M23583/1197/5015H/000981

10. Install roller arm (D) in movable face with a steel washer (B) on each side of arm.

11. Install pivot pin (C) from right to left. Install steel washer and NEW spring pin (A).

A—Spring Pin
B—Steel Washer
C—Pivot Pin
D—Roller Arm



M23584/1197/5015I/000981

12. Check sheave faces for pitting or wear. Replace as necessary.

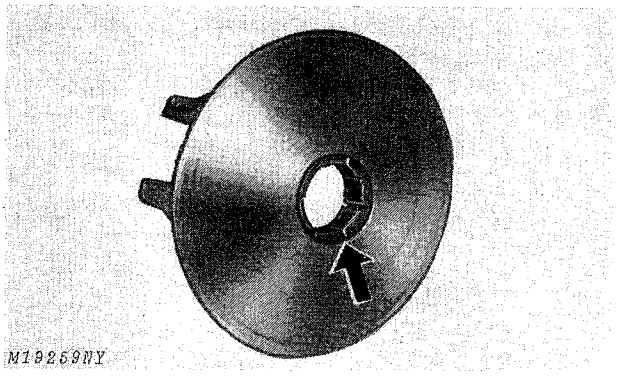
13. Inspect bushing of movable face and hub of fixed face for damage or wear.

14. Measure outside diameter of fixed face hub and inside diameter of movable face bushing. Allowable clearance should not exceed (0.762 mm) 0.030 inch. If clearance is greater, replace movable face bushing.

15. Use a hacksaw blade to carefully cut through the movable face bushing in several places.

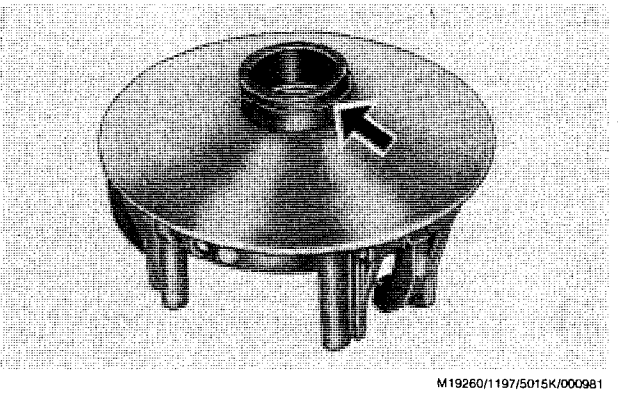
IMPORTANT: DO NOT saw into metal of movable face.

16. Remove bushing with a small cold chisel and hammer.



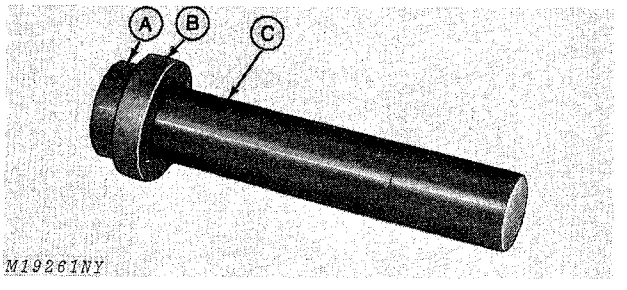
M19259/1197/5015J/000981

17. Install new bushing with snap ring up.



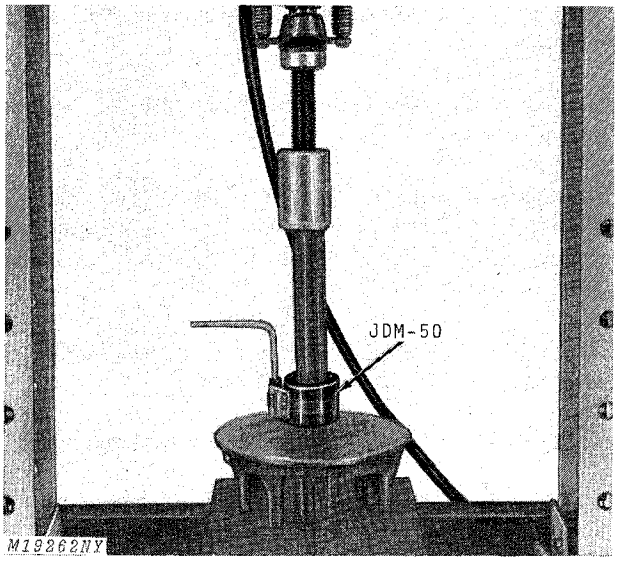
M19260/1197/5015K/000981

18. Use Owatonna Tool Company, Bushing, Bearing and Seal Driver Set. Install 27516 Disk (B) and 27509 Disk (A) to 27488 Handle (C).



M19261/1197/5015L/000981

19. Use a press and JDM-50 Ring Compressor to install bushing flush with movable face.



M19262/1197/5015M/000981

ASSEMBLE DRIVE SHEAVE

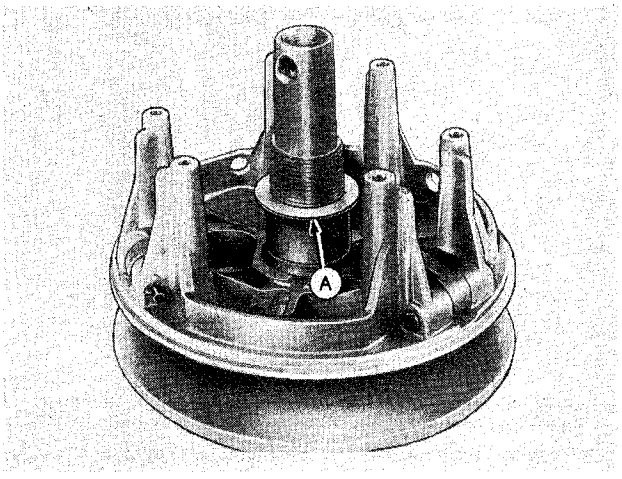
Use Never-Seez Lubricant (PT569) or its equivalent on the following:

1. Roller arms and pins in movable face.

2. Guide buttons in spider and mating surface of movable face.

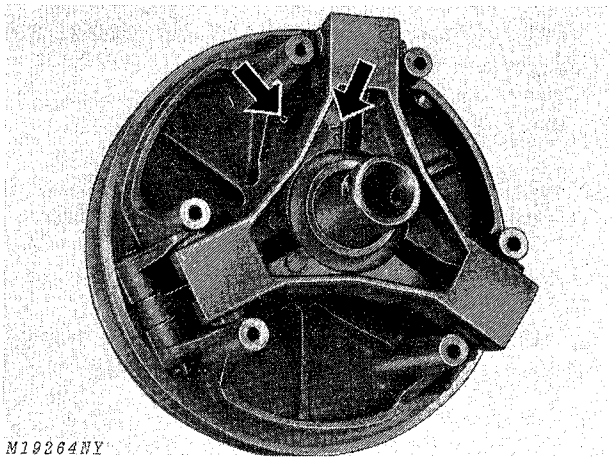
NOTE: Use Loctite on spider-to-hub threads.

3. Install movable face over fixed face hub with required number of spacer rings (A).



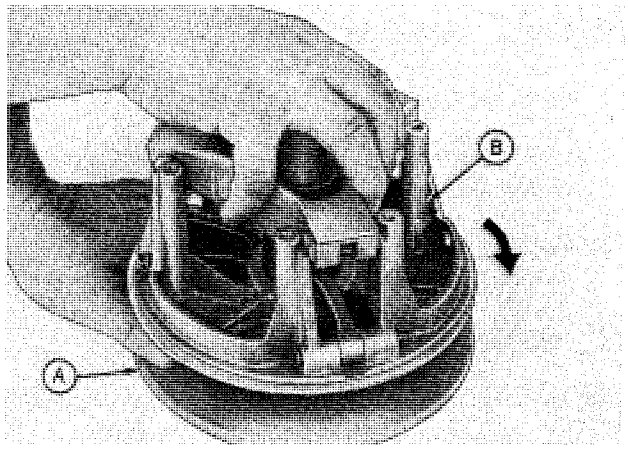
M29304/1197/5015N/250981

4. Install spider on movable face. Align identification marks on spider with identification marks on movable face. This is necessary for proper balance of drive sheave.



M19264/1197/5015O/250981

5. Hold fixed sheave (A) and turn the spider and movable sheave (B) clockwise. Tighten the assembly as far as possible by hand.



M19265/1197/5015P/250981

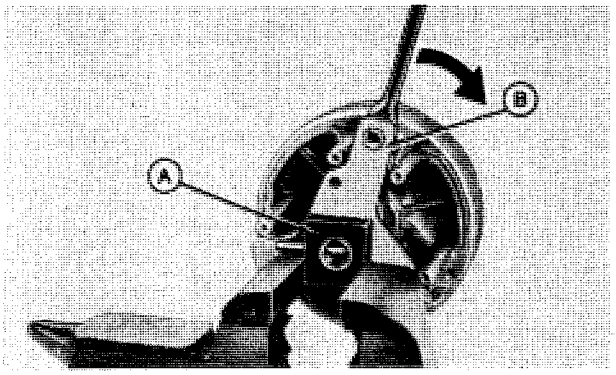
6. Install JDM-41-3 Spider Tool (B) and JDM-41-5 Hub Lock Tool (A) over fixed face hub.

7. Securely clamp assembly in vise.

8. Install a 1/2-inch socket wrench with long handle in Spider Tool and turn clockwise to tighten spider to hub.

9. Remove Hub Lock and Spider Tools.

10. Install spring and cover plate. Tighten the six screws evenly to (13.6 to 16.3 N·m) 10 to 12 ft-lbs.



M19266/1197/5015Q/250981

INSTALL DRIVE SHEAVE

1. Install drive sheave on crankshaft.

2. Install retaining cap screw and washer. Torque retaining cap screw (68 N·m) 50 ft-lbs.

NOTE: Pull on recoil start rope until dogs engage. Hold rope firmly while torquing retaining cap screw.

3. Install drive belt and knock-out plug.

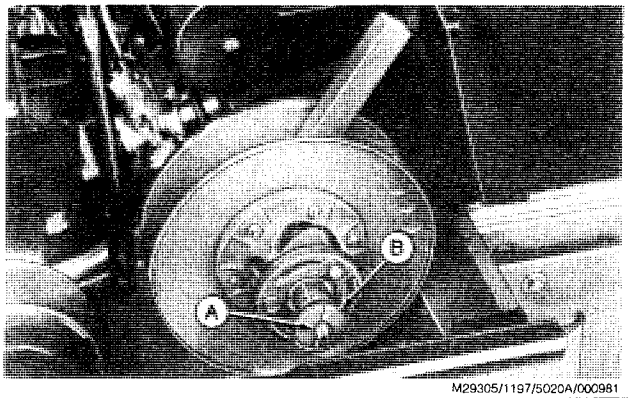
NOTE: Always install drive belt so number on belt can be read when viewed from the left side.

1197/5015R/250981

REMOVE DRIVEN SHEAVE

1. Remove belt guard and drive belt.

2. Remove cap screw (A), washer (B) and spacers. Remove driven sheave and key.



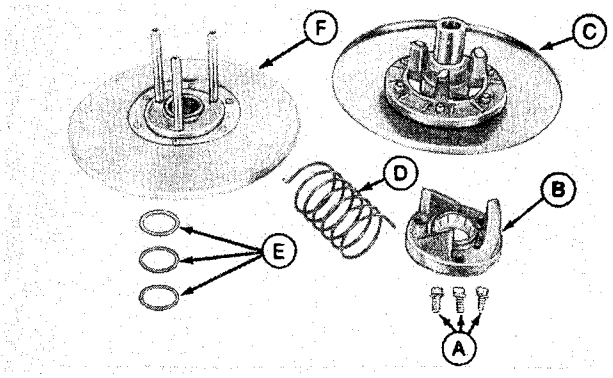
M29305/1197/5020A/000981

DISASSEMBLE DRIVEN SHEAVE

1. Remove cap screws (A) and cam (B) from movable face (F).

2. Remove spring (D) and fixed face (C) with insert buttons.

A—Cap Screws
B—Cam
C—Fixed Face
D—Spring
E—Spacers
F—Movable Face

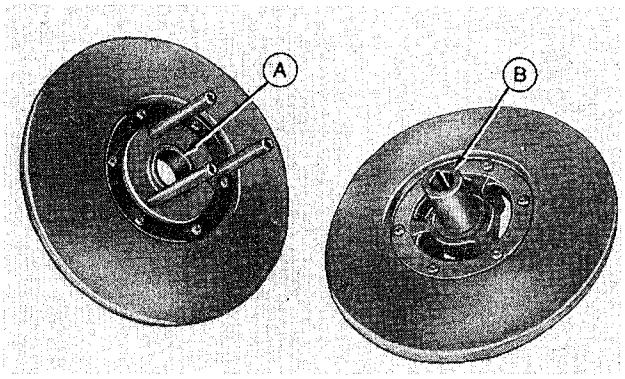


M28445/1197/5020B/000981

INSPECT AND REPAIR DRIVEN SHEAVE

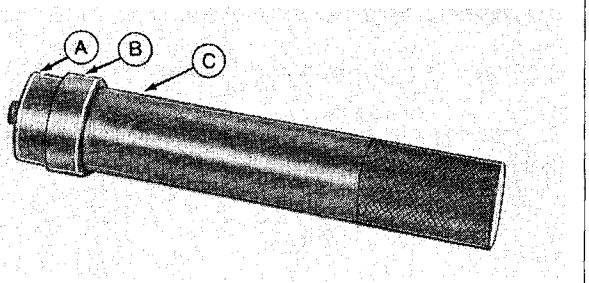
1. Clean all components in solvent.

2. Check movable face bushing (A) and fixed face hub (B) for wear. Replace parts as necessary. Excessive looseness could cause binding.



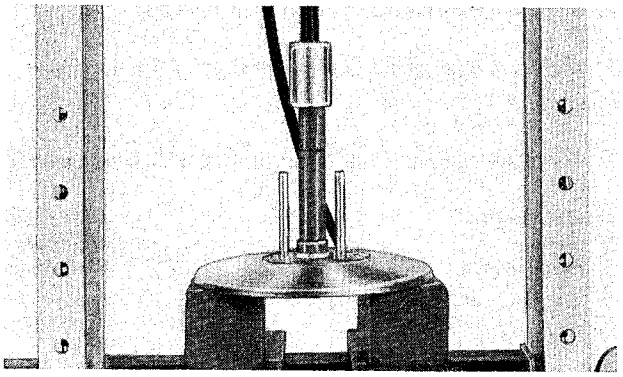
M19272/1197/5020C/000981

3. Use Owatonna Tool Company Bushing, Bearing and Seal Driver Sets. Install 27507 Disk (B) and 27505 Disk (A) on 27488 Handle (C).



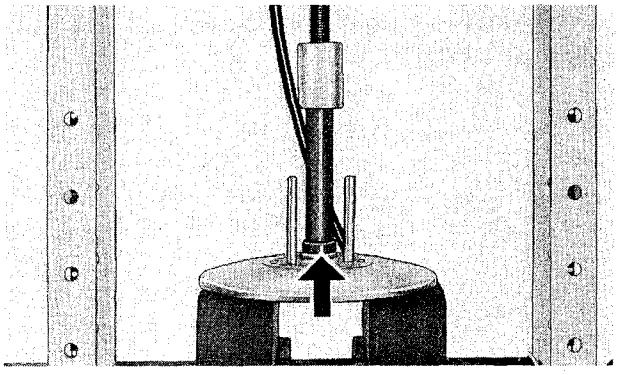
M19273/1197/5020D/000981

4. Use a press to remove old bushing.



M19274/1197/5020E/000981

5. Use a press to install new bushing flush with the hub.

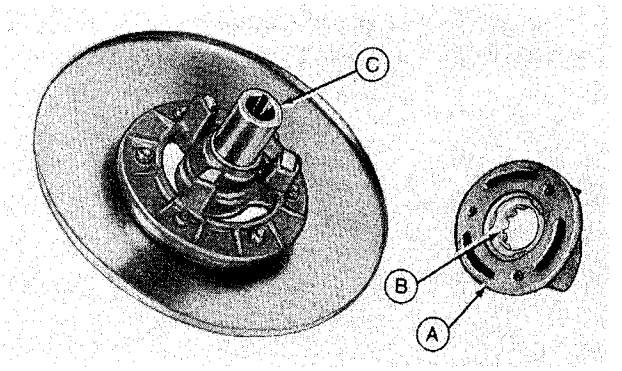


M19275/1197/5020F/000981

6. Inspect spring for cracks or pits. Replace as necessary.

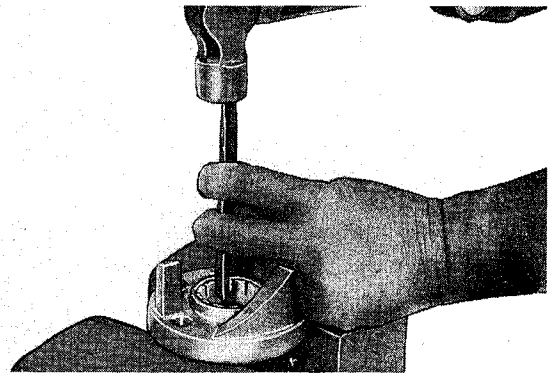
7. Check sheave faces with a straight-edge. Replace if worn, grooved, scored or pitted.

8. Check bushing (B) in cam (A) and fixed face hub (C) for wear. Replace as necessary.



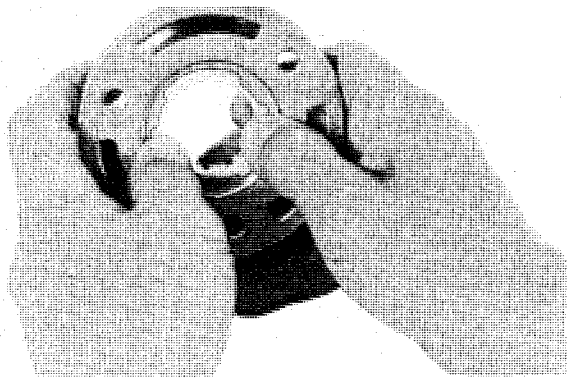
M19276/1197/5020G/000981

9. Place cam on two wooden blocks and use a cold chisel to remove bushing.



M19277/1197/5020H/000981

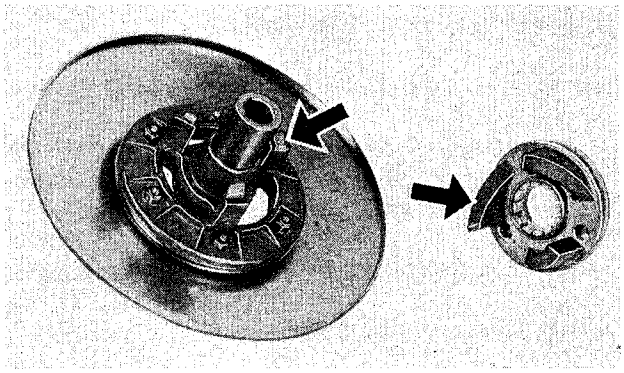
10. Install new bushing by pushing it in place with your thumbs. Be sure bushing is aligned properly when installing.



M19278/1197/5020I/000981

11. Inspect insert buttons for wear. Buttons and mating surface on cam must be smooth.

NOTE: To remove worn buttons, heat tower slightly with a hand torch. Grasp button with a vise grip and pull button out.



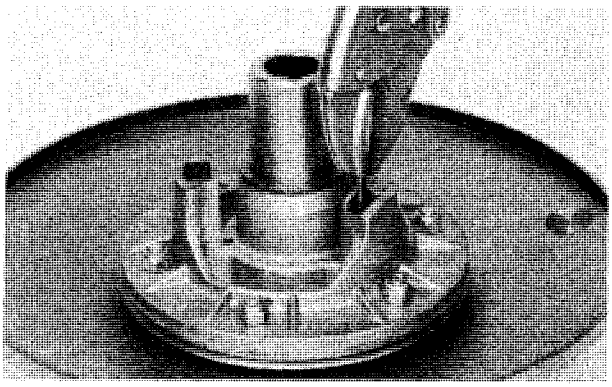
M19279/1197/5020J/000981

12. Replace broken insert buttons as follows: Clamp a steel shank (not aluminum shank) pop rivet securely with a vise grip and heat end red hot with a hand torch. Push steel shank into center of broken insert button. Allow pop rivet to cool slightly and remove insert button shank.

NOTE: Repeat process until insert button shank is completely removed from bore.

13. Clean all glue out of bore.

14. Use a plastic or wood mallet to tap button into bore until it is seated flush. DO NOT tap too hard. Buttons are easily broken if hit too hard.



M28535/1197/5020K/071081

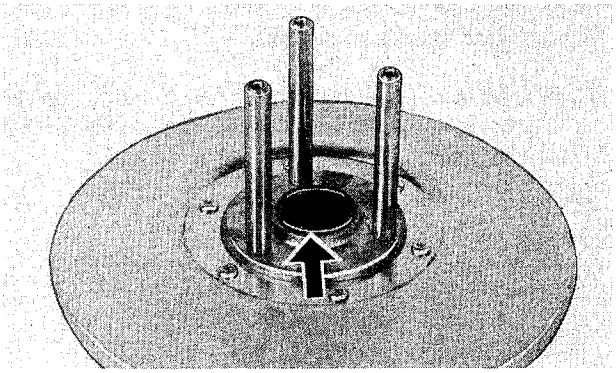
ASSEMBLE DRIVEN SHEAVE

NOTE: The spring should be pretensioned in the No. 2 hole.

As temperature or altitude increases, the drive sheave, driven sheave and carburetor must be modified to obtain proper governed speed.

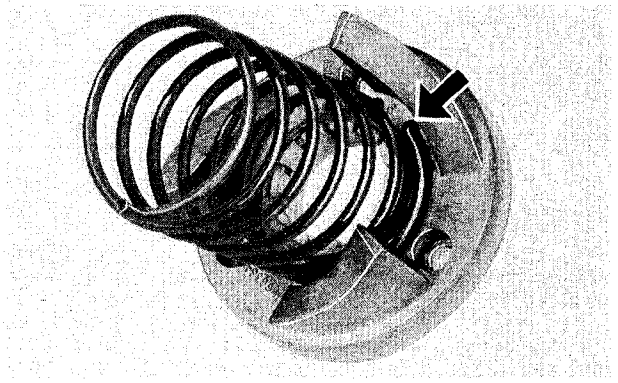
See Section 50 for governed engine speed.

1. Lay movable sheave flat.



M19281/1197/5020L/000981

2. Install fixed sheave hub through movable sheave.
3. Install spring in No. 2 hole in cam.

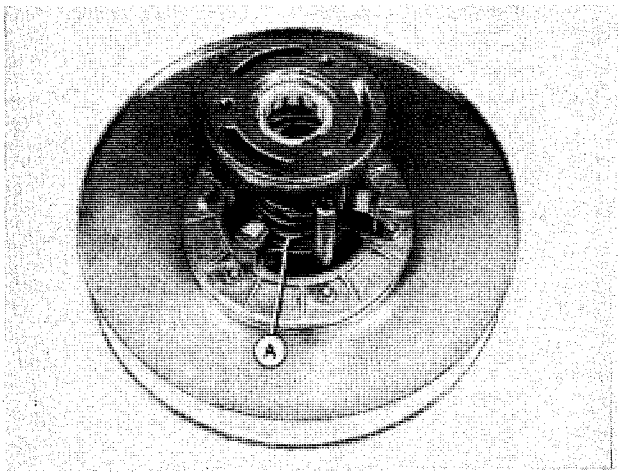


M19282/1197/5020M/000981

4. Install cam with spring over post of fixed face with tang of spring in hole in fixed face (A).

5. Rotate cam past the proper ramp. Push down on cam, making sure posts of movable face fit in recesses in cam.

6. Install and tighten cap screws.



M29306/1197/5020N/000981

INSTALL DRIVEN SHEAVE

1. Lubricate drive shaft and inside of hub with Never-Seez Lubricant (PT569).

2. Install spacers and shims on shaft.

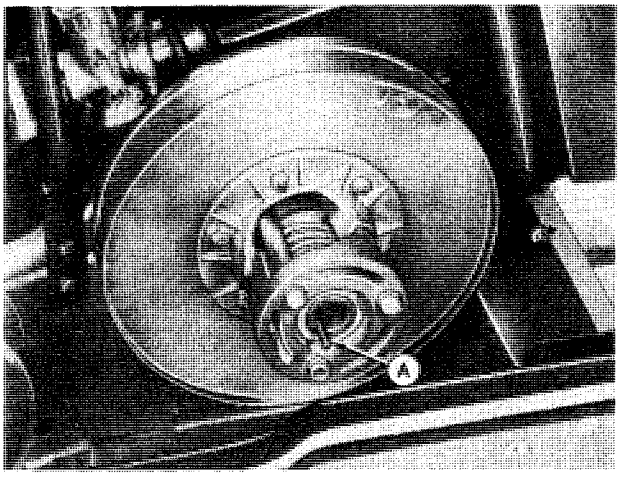
3. Place sheave in line with shaft and back key (A) out of sheave.

4. Slide sheave on shaft and push key in to secure sheave to shaft.

5. Install spacers, washer and cap screw. Torque cap screw to (27 N·m) 20 ft-lbs. Recheck alignment.

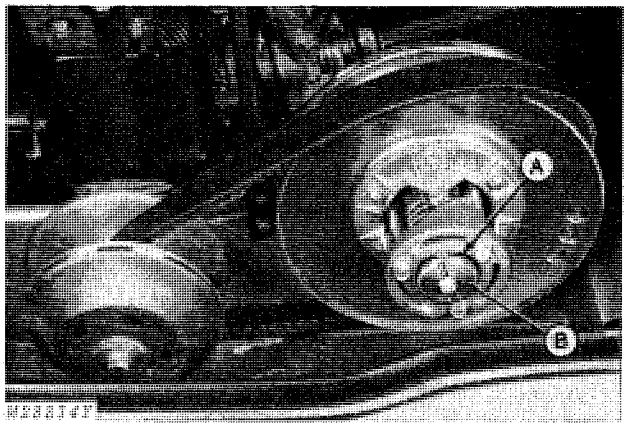
6. Install drive belt so that number on belt can be read when viewed from left side of snowmobile.

7. Install belt guard.



M29307/1197/5020O/000981

REMOVE AND INSTALL DRIVE BELT



IMPORTANT: If there is a loss of snowmobile performance or if the belt appears too loose, remove "anti-creep" shims (A) from the outside of the driven sheave. Remove shims until the snowmobile just starts to "creep" at idle speed and then add back one shim. After this adjustment, if snowmobile performance is not satisfactory, realign drive and driven sheaves and install a new drive belt.

If snowmobile has a tendency to "creep", at idle speed, after installing a new belt, add "anti-creep" shims (A) to the outside of the driven sheave, as necessary, to stop "creep" at idle speed.

1. Push in on center of driven sheave and lift belt over sheave half.

2. Remove belt from drive sheave.

IMPORTANT: Never pry belt over sheaves. No prying is necessary if driven sheave is opened correctly.

CAUTION: Keep fingers out of area between center of driven sheave halves when sheave is opened.

3. Install belt in opposite sequence. Install belt so number on belt can be read when viewed from the left side.

NOTE: The drive belt should be replaced when its width is reduced by (3.175 mm) 1/8 inch. Correct drive belt width is (31.75 mm) 1-1/4 inches.

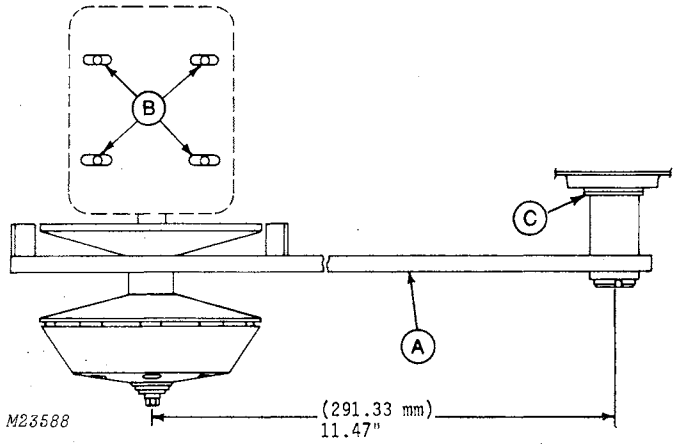
M23314/1197/5025A/000981

DRIVE BELT FUNCTIONS

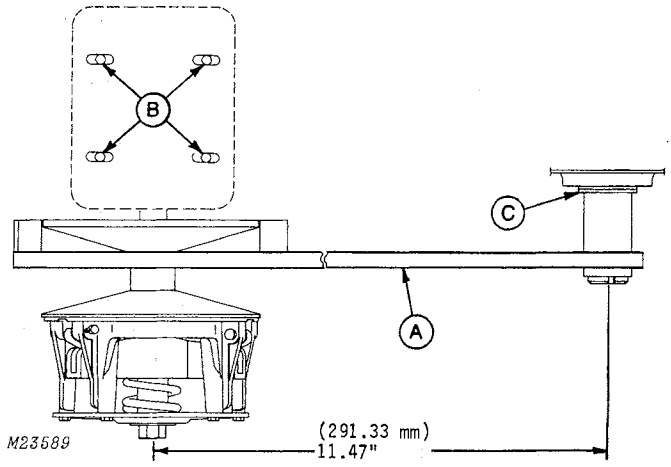
Problem	Cause	Solution
Uneven belt wear on one side only.	Sheave misalignment. Loose engine base.	Align sheaves. Replace or tighten base.
Belt glazed or has baked appearance.	Insufficient pressure on belt sides. Excessive horsepower for belt and clutch. Oil on sheave surfaces.	Check drive sheave for worn flyweights or clutch arms. Be sure correct clutch is being used. Clean sheave surfaces.
Belt worn excessively in top width.	Excessive slippage. Rough or scratched sheave surfaces. Improper belt angle.	Check drive sheave for smooth operation. Replace or repair sheaves. Check alignment.
Belt worn narrow in one section.	Excess slippage due to frozen track or clutch not functioning properly.	Rotate track by hand until free. Repair or replace clutch.
Belt too tight at engine idle.	Idle speed too high. Incorrect belt length. Incorrect shims in secondary.	Reduce speed. Check belt. Add a shim.
Belt disentegration.	Excessive belt speed.	Check engine speed at wide open throttle.
Belt worn concave on sides.	Excessive ride-out on drive sheave.	Repair or replace sheave. Belt too long.
Belt "flip-over" at high speed.	Sheave misalignment. Excessive belt speed. Excessive ride-out on drive sheave.	Align sheaves. Reduce engine rpm. Belt too long.
Belt edge cord breakage.	Sheave misalignment. Improper belt.	Align sheaves. Check drive belt.
Flex cracks between cogs.	Belt worn out.	Replace belt.
Sheared cogs, compression section fractured or torn.	Improper belt. Belt rubbing stationary object.	Check belt. Check drive sheave.

1197/5025B/000981

ALIGN DRIVE BELT (Serial No. 95,001-120,000)



94C Clutch



102C Clutch

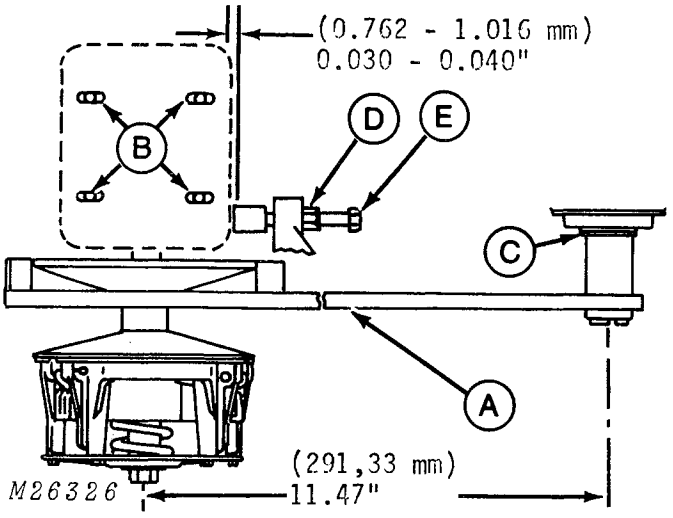
1. Remove drive belt.
2. Remove driven sheave and shims.
3. Install JDM-81 Clutch Aligning Tool (A).
4. For side-to-side adjustment, add shims (C) between the tool (A) and secondary shaft bearing. Shims are available in (0.457 or 1.524 mm) 0.018 or 0.060-inch thicknesses.
5. For forward or rearward adjustment, loosen engine mounting bolts (B) and move engine.

IMPORTANT: Always rotate the drive sheave 120 degrees and recheck alignment.

6. Install drive belt so number on belt can be read when viewed from the left side.

M23588 M23589/1197/5025C/000981

ALIGN DRIVE BELT (Serial No. 120,001-)



A—JDM-81 Clutch Aligning Tool
B—Engine Mounting Bolts
C—Shims (0.018 or 0.060 inch)
D—Snubber Lock Nut
E—Snubber Cap Screw

1. Remove drive belt.

2. Remove driven sheave and shims.

3. Loosen engine snubber lock nut (D). Back off snubber cap screw (E).

4. Install JDM-81 Clutch Aligning Tool (A).

NOTE: JDM-81 Clutch Aligning Tool will fit snug on the primary sheave shaft. If necessary, tap the tool into place by hand over the primary sheave shaft.

5. For side-to-side adjustment, add shims (C) between the tool (A) and secondary shaft bearing. Shims are available in (0.457 or 1.524 mm) 0.018 or 0.060-inch thicknesses.

6. For forward or rearward adjustment, loosen engine mounting bolts (B) and move engine.

IMPORTANT: Always rotate the drive sheave 120 degrees and recheck alignment.

7. Thread snubber cap screw (E) against engine crankcase. Back off snubber to give (0.762 to 1.016 mm) 0.030 to 0.040-inch clearance between the engine crankcase and snubber. Tighten lock nut (D).

IMPORTANT: The (0.762 to 1.016 mm) 0.030 to 0.040-inch clearance must be maintained between the engine crankcase and snubber. DO NOT use the snubber as a jackscrew to align the engine.

8. Install drive belt so number on belt can be read when viewed from the left side.

M26326/1197/5025D/250981

CHAIN CASE FINAL DRIVE RATIOS (Serial No. 95,001-120,000)

Snowmobile	Upper Sprocket (No. of Teeth)	Lower Sprocket (No. of Teeth)	Chain Length (No. of Pitches)	Ratio
340 Trailfire	17*	35*	62	2.06:1
440 Trailfire	21*	39*	66	1.86:1
All Machines	25	39	62	1.56:1
All Machines	17	42	66	2.47:1
All Machines	24	40	68	1.67:1
All Machines	22	38	66	1.72:1

**Factory Installed*

CHAIN CASE FINAL DRIVE RATIOS (Serial No. 120,001-)

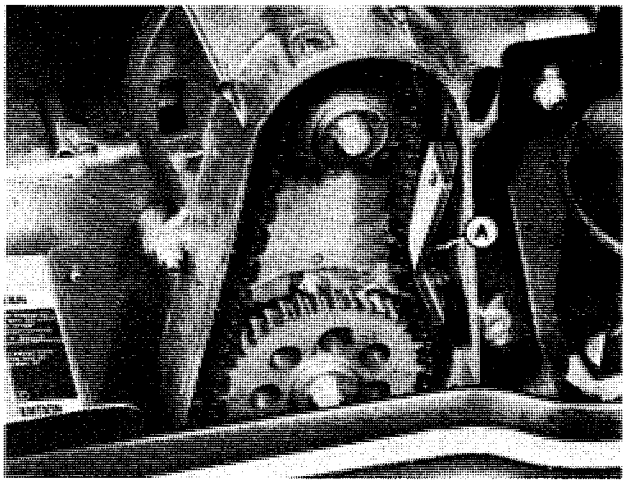
Snowmobile	Upper Sprocket (No. of Teeth)	Lower Sprocket (No. of Teeth)	Chain Length (No. of Pitches)	Ratio
340 Trailfire	21*	39*	66	1.86:1
440 Trailfire and Trailfire LX	25*	39*	68	1.56:1
All Machines	17	35	62	2.06:1
All Machines	17	42	66	2.47:1
All Machines	24	40	68	1.67:1
All Machines	22	38	66	1.72:1

**Factory Installed*

NOTE: Factory installed sprockets on the 340 Trailfire Snowmobile are optional on the 440 Trailfire and Trailfire LX Snowmobile and vice versa.

1197/5030A/000981

REMOVE DRIVE CHAIN AND SPROCKETS

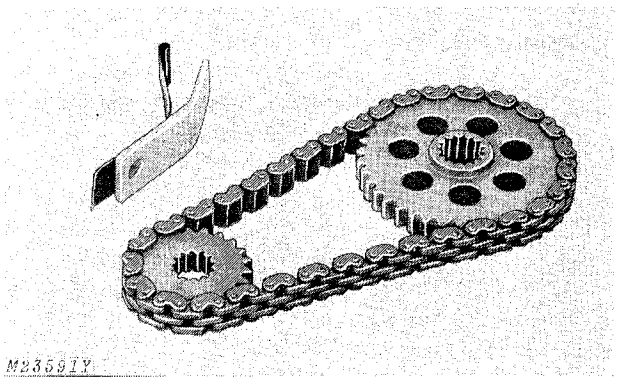


1. Loosen chain case cover to drain oil. Remove cover.
2. Remove chain tensioner (A).
3. Remove sprockets and drive chain.

IMPORTANT: Record the number of shims between sprockets and bearings for reassembly.

M29308/1197/5030B/000981

INSPECT CHAIN AND SPROCKETS



1. Inspect drive chain for wear. Replace chain if worn or broken.

NOTE: Drive chain is an endless chain and cannot be repaired.

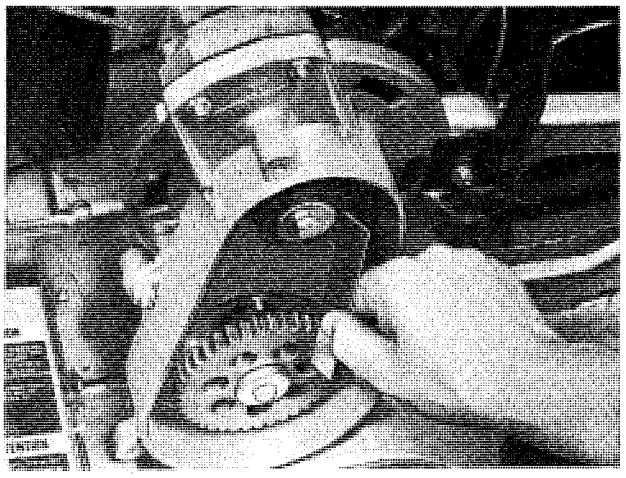
2. If new chain is installed, replace sprockets. New chain will not properly match worn sprockets.

NOTE: Rapid chain and sprocket wear is caused by misalignment or lack of lubrication.

3. Replace chain tensioner if contact surface is worn until only (1.588 mm) 1/16 inch of material remains.

M23591/1197/5030C/000981

ALIGN DRIVE SPROCKETS



1. Install spacer and four (0.254 mm) 0.010-inch shims and sprocket on lower shaft. Tighten cap screw.

2. Install two (0.457 mm) 0.018-inch shims and upper sprocket. Tighten cap screw.

3. Place straight-edge on flat surface of lower sprocket and slide toward upper sprocket to check alignment. If sprockets do not align, add or deduct shims as necessary.

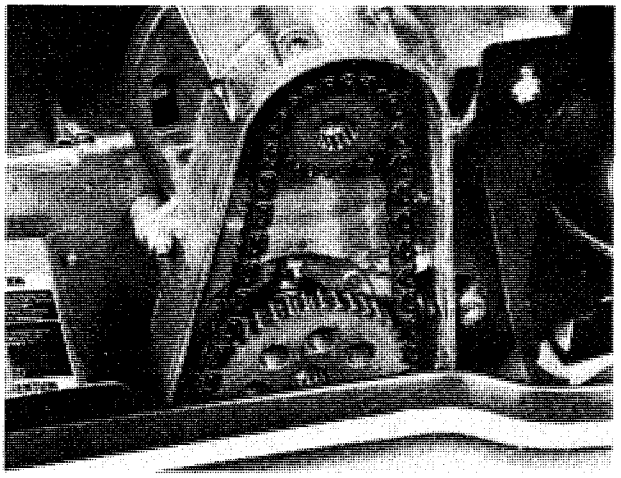
IMPORTANT: Use a maximum of three (0.457 mm) 0.018-inch shims behind upper sprocket and ten (0.254 mm) 0.010-inch shims behind lower sprocket. When sprockets are shimmed correctly, the shafts should be recessed into the sprockets. DO NOT allow shafts to protrude beyond the sprockets.

NOTE: Upper and lower sprockets must be aligned within (0.254 mm) 0.010 inch of each other.

4. Remove sprockets and leave spacer and shims in place.

M23592/1197/5030D/000981

INSTALL DRIVE CHAIN AND SPROCKETS



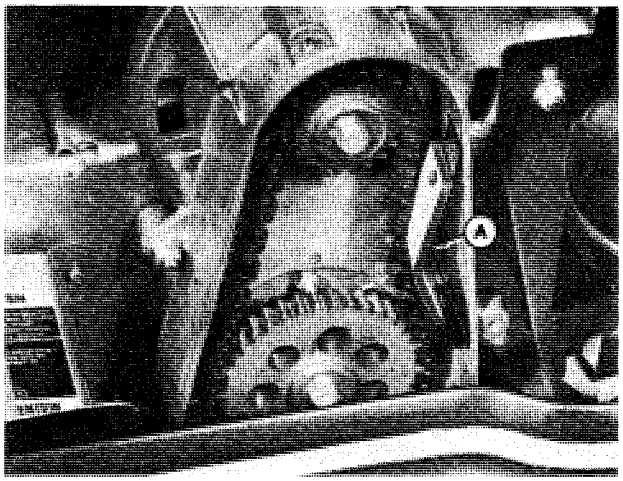
1. Place drive chain around both sprockets.

2. Install sprockets and chain as an assembly.

3. Apply Loctite to cap screws and tighten securely.

M23593/1197/5030E/250981

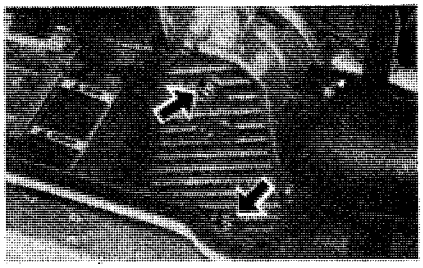
4. Install chain tensioner (A).



M29308/1197/5030F/000981

5. Install chain case cover.

6. Remove upper and lower plugs. Add SAE 90 oil in the upper hole until it starts to run out lower hole. Replace plugs.



M29317/1197/5030G/000981

REMOVE SECONDARY SHAFT

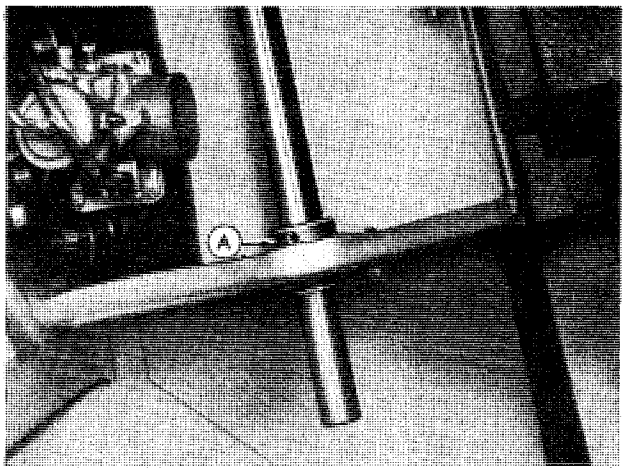
1. Remove drive belt and driven sheave.

IMPORTANT: Record shims between retaining washer and driven sheave and driven sheave and bearing. These shims tension and align the driven sheave.

2. Remove air intake silencer.

3. Remove locking collar set screw (A).

4. Loosen collar by driving it clockwise.



M29309/1197/5030H/000981

5. Remove left-hand bearing (A).

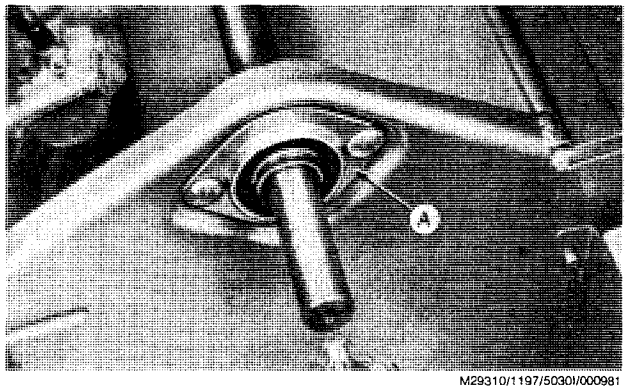
6. Remove chain case cover, sprockets and chain.

IMPORTANT: Record shims between sprockets and bearings for reassembly.

7. Loosen right-hand bearing.

8. Slide secondary shaft to the left to remove.

NOTE: DO NOT lose spring inside hub of brake disk.



M29310/1197/5030I/000981

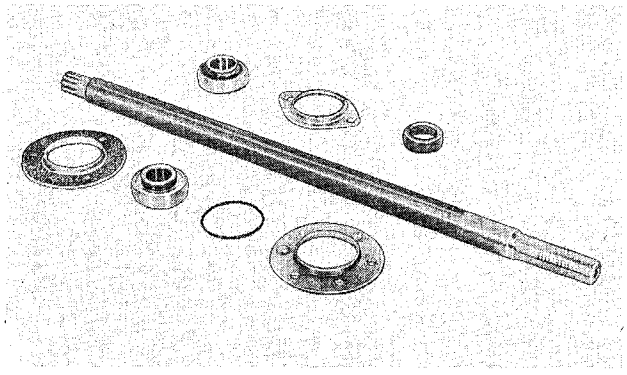
INSPECT SECONDARY SHAFT

1. Check shaft bearing surfaces for evidence of bearings turning on shaft.

2. Inspect splined end.

3. Replace shaft if defective.

4. Check bearing and flangettes.



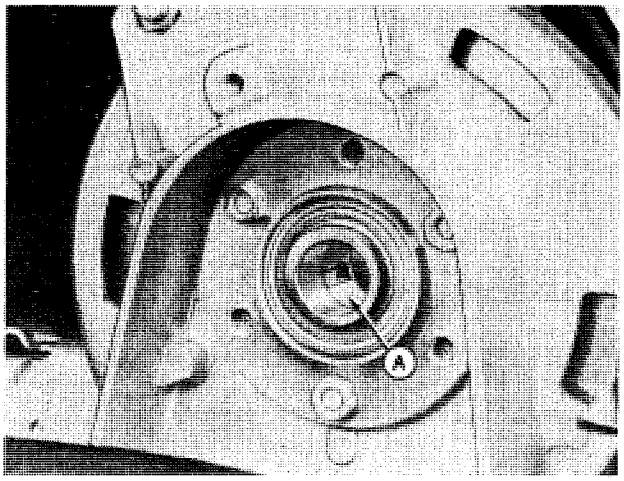
M23596/1197/5030J/000981

INSTALL SECONDARY SHAFT

1. Install flat spring in brake disk (A).

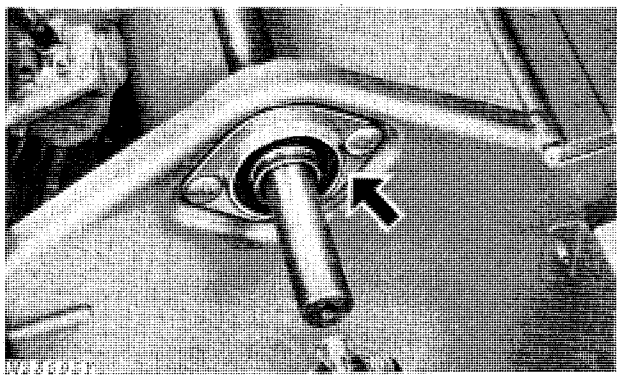
2. Position brake disk and install secondary shaft through brake disk and chain case bearing.

IMPORTANT: Use Never-Seez on secondary shaft in area of brake disk. DO NOT allow Never-Seez to get on face of brake disk.



M29311/1197/5030K/000981

3. Install locking collar, bearing and flangettes on shaft and secure to left side of tunnel.



M23595/1197/5030L/000981

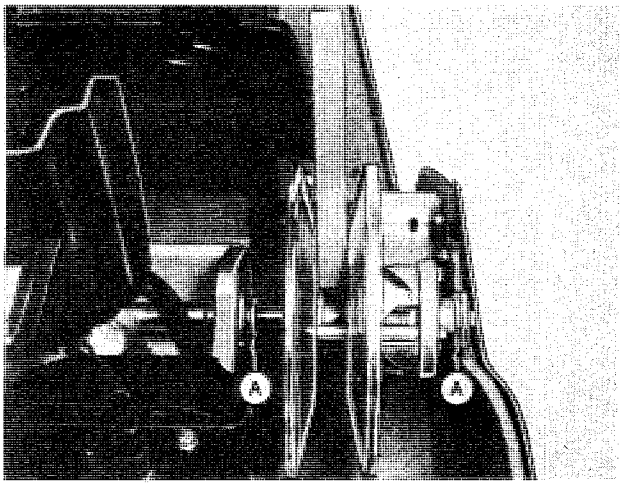
4. Install spacer, shims, sprockets and drive chain. Add chain case oil.

5. Install spacer, shims (A) and driven sheave.

6. Install air intake silencer.

7. Recheck belt alignment.

8. Install drive belt.



M29312/1197/5030M/000981

REMOVE DRIVE SHAFT

1. Siphon fuel from tank and drain chain case oil.

2. Remove drive belt, driven sheave and shims.

3. Remove chain case cover, tensioner, sprockets and drive chain.

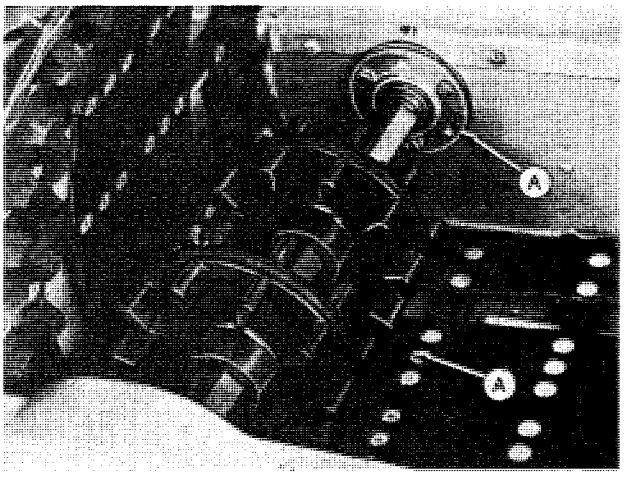
NOTE: Use JDST-24 Lift and Repair Stand. If stand is not available, turn snowmobile on its side.

4. Remove slide suspension. See Section 60.

5. Remove bolts securing drive wheels to drive shaft.

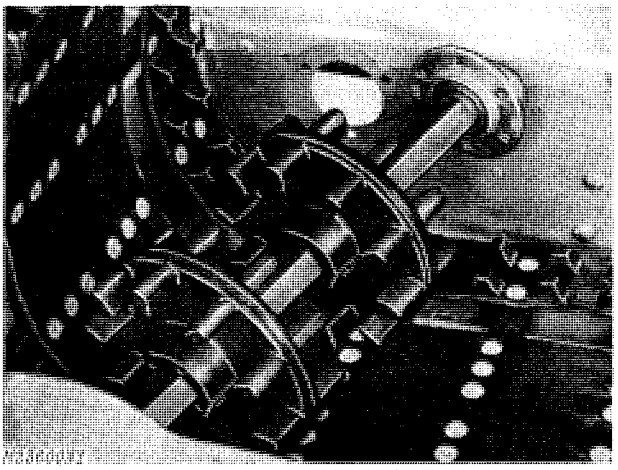
6. Move drive wheels toward center of shaft (A).

7. Remove cap screws securing bearing flangettes to tunnel.



M29313/1197/5030N/000981

8. Move drive shaft toward chain case side. Lift end with spacer to remove shaft.



M23600/1197/5030O/000981

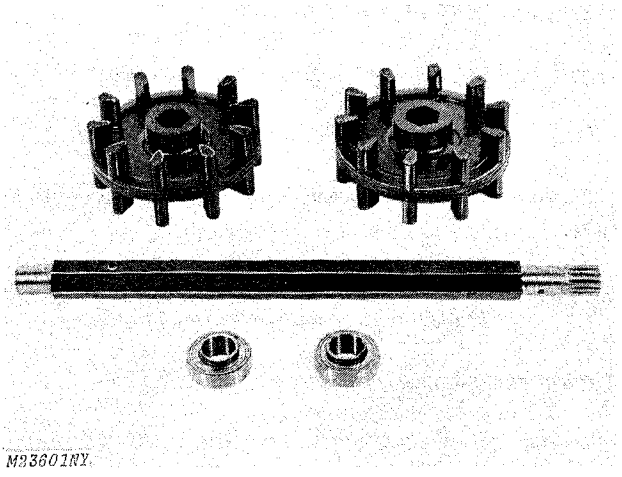
INSPECT DRIVE SHAFT

1. Check shaft bearing surfaces for evidence of bearings turning on shaft.

2. Inspect drive shaft bearings. Replace them if they are binding, worn or noisy. Use a NEW O-ring on chain case bearing.

3. Inspect drive wheels and replace them if lugs are worn down to metal center.

NOTE: Rapid wear on leading edge of drive lugs indicates snowmobile was run without proper snow lubrication. Wear on trailing edge is normal after many hours of operation.

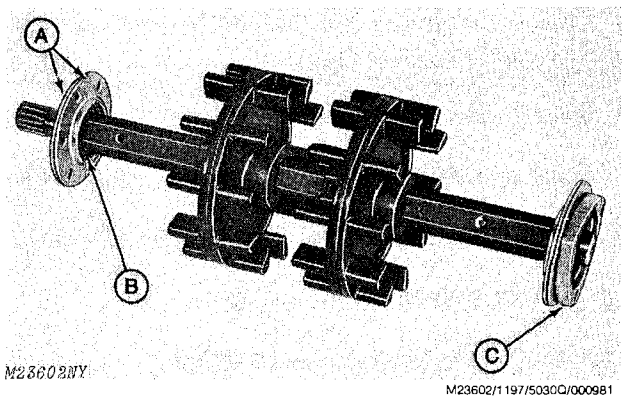


M23601NY

M23601/1197/5030P/000981

INSTALL DRIVE SHAFT

1. Assemble bearing flangettes (A), bearing (B) and spacer (C) on drive shaft.

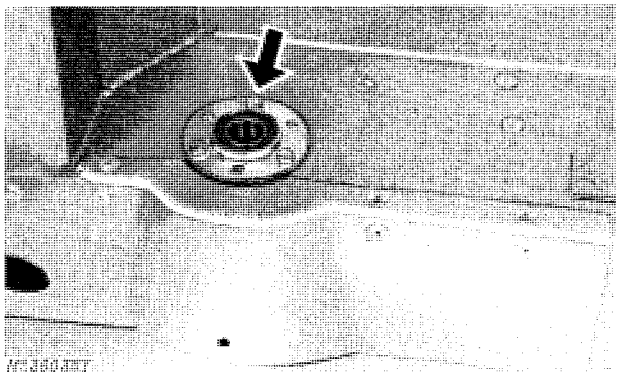


M23602/1197/5030Q/000981

2. Lubricate and install O-ring on chain case bearing. Install bearing and flangettes in tunnel on chain case side. DO NOT tighten nuts.

NOTE: Install new gasket on flangette side facing chain case. Gasket sticks to flangette and is between flangette and chain case.

IMPORTANT: Bearing locking flanges must face splined end of drive shaft.



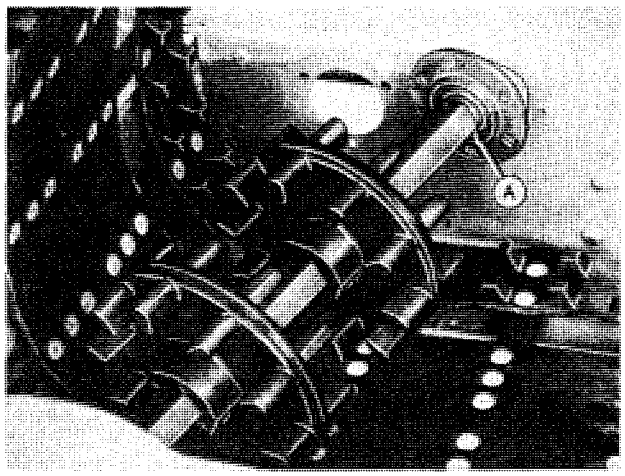
M23603/1197/5030R/000981

3. Position splined end of drive shaft (A) through bearing in tunnel.

IMPORTANT: Be sure chain case bearing O-ring is in correct position, or oil leakage will occur.

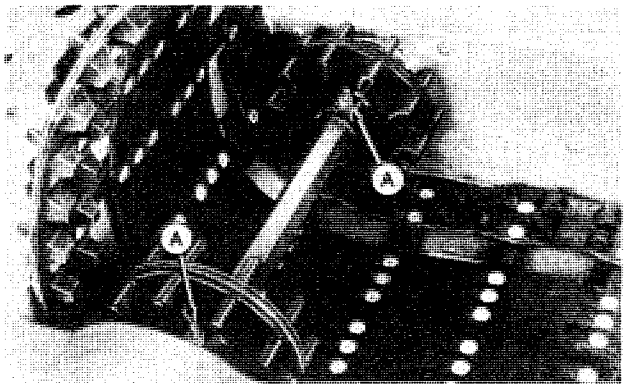
4. Position drive shaft and spacer. Install and tighten cap screws and nuts securing bearing flangettes.

5. Tighten bearing flangette nuts on chain case side.



M29314/1197/5030S/000981

6. Move drive wheels into position and secure with bolts, washers and lock nuts (A).



7. Install slide suspension.

8. Install sprockets, chain and tensioner in chain case.

8. Install driven sheave and drive belt. Align sheave.

10. Add SAE 90 oil to chain case.

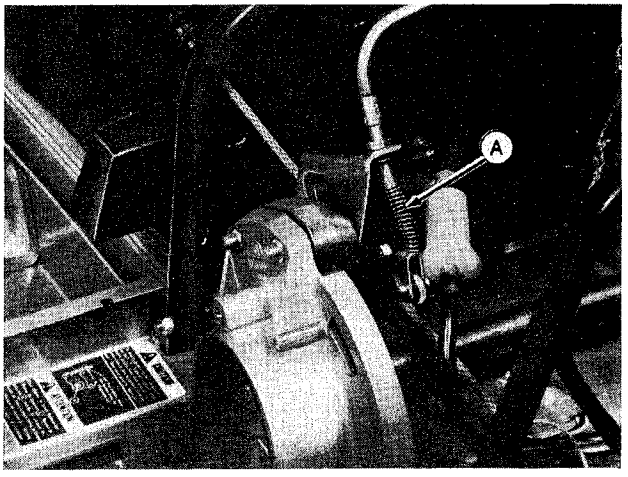
11. Adjust track tension. See Section 60.

12. Fill fuel tank.

M29315/1197/5030T/000981

REMOVE CHAIN CASE

1. Relieve track tension.



2. Remove engine muffler and bracket.

3. Loosen chain case cover screws to drain oil.

4. Remove chain case cover, tensioner, sprockets and drive chain.

5. Remove upper and lower flangette nuts.

6. Remove air intake silencer.

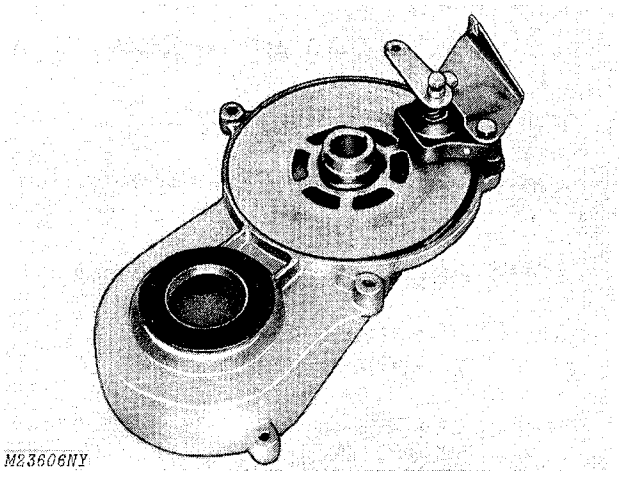
7. Remove drive belt, drive sheave and secondary shaft.

8. Remove brake cable (A) from brake arm and bracket.

M29316/1197/5030U/000981

9. Remove chain case with brake assembly.

10. Remove brake disk, body, retainer, pucks and brake cable bracket from chain case.

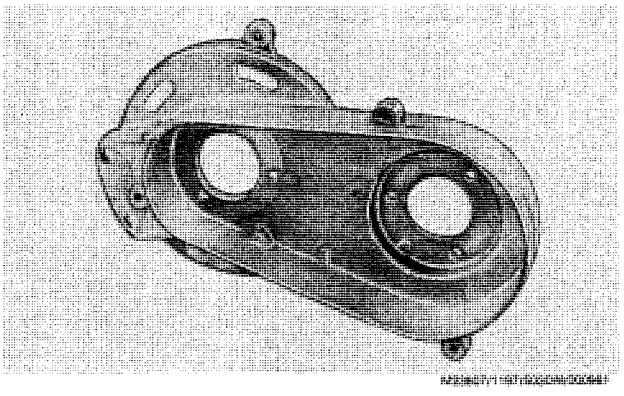


M23606/1197/5030V/000981

INSPECT CHAIN CASE

1. Inspect chain case for cracks or other damage that could cause chain and sprocket misalignment or oil leakage.

2. Install new rubber gasket when installing chain case cover.



INSTALL CHAIN CASE

1. Install chain case and muffler bracket to the tunnel.

2. Install upper bearing and flangettes.

3. Place brake disk in chain case. Install flat spring in brake disk hub.

4. Install secondary shaft through brake disk and upper bearing.

5. Install secondary shaft left-hand bearing.

6. Install sprockets and drive chain, tensioner and cover. Use new gasket. Add SAE 90 oil to chain case.

7. Install brake puck body and puck, retainer and brake cable. Adjust brakes.

8. Install engine muffler and air intake silencer.

9. Install driven sheave and drive belt.

10. Adjust track tension. See Section 60.

1197/5030X/000981

REMOVE DISK BRAKE

1. Remove drive belt and driven sheave.

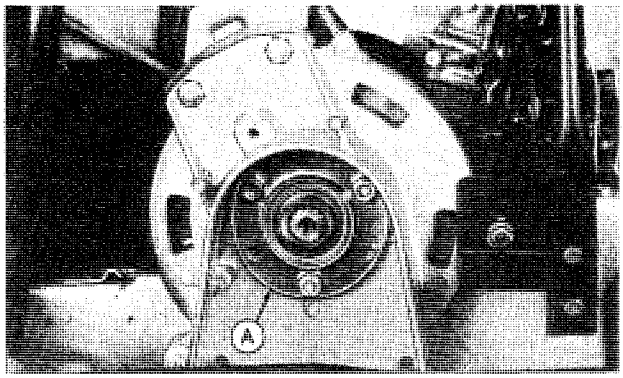
2. Remove air intake silencer.

3. Remove secondary shaft left-hand bearing.

4. Remove chain case cover, chain tensioner, drive chain and sprockets.

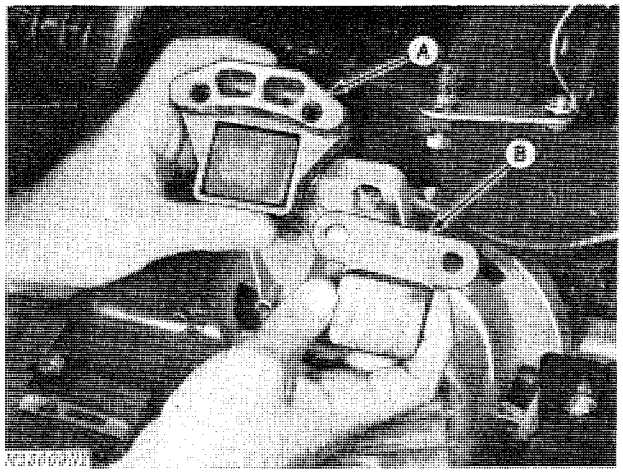
5. Loosen secondary shaft bearing assembly (A) in the chain case.

6. Slide secondary shaft to the left to free it from the brake disk.



M29317/1197/5035A/000981

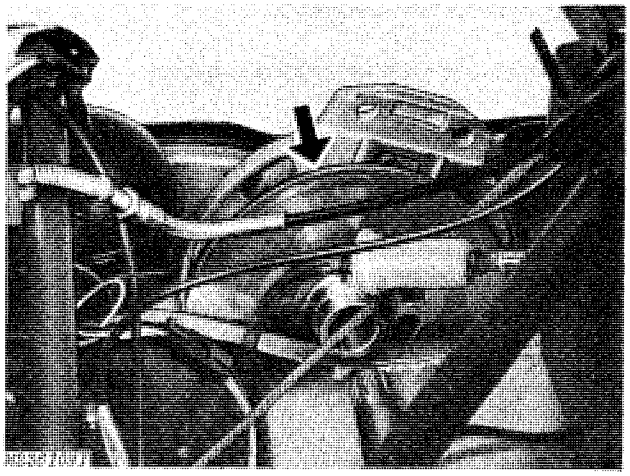
7. Remove brake puck body (A), brake cable, and brake puck retainer (B).



M23609/1197/5035B/000981

8. Remove brake disk.

NOTE: If the brake disk is warped (usually due to extreme braking conditions), install AM54181 heavy-duty brake disk.



M23610/1197/5035C/000981

INSPECT DISK BRAKE

1. Replace brake pucks if contaminated or worn enough to prevent proper brake adjustment.

2. Replace brake disk or cable if worn or damaged.

1197/5035D/000981

INSTALL DISK BRAKE

1. Install brake disk (A), brake puck retainer (C) and brake puck body (B).

NOTE: Whenever a new disk is installed, always install new brake pucks.

2. Position secondary shaft through brake disk and chain case bearing.

IMPORTANT: Use Never-Seez on secondary shaft in area of brake disk to prevent disk from seizing or sticking.

3. Tighten chain case bearing assembly.

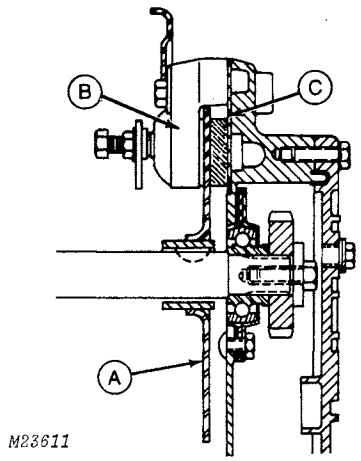
4. Install and tighten secondary shaft left-hand bearing.

5. Install air intake silencer.

6. Install driven sheave and drive belt.

7. Install drive chain and sprockets, chain tensioner and chain case cover. Add SAE 90 oil to chain case.

8. Adjust brake.



M23611

M23611/1197/5035E/000981

REMOVE AND INSTALL BRAKE PUCKS

1. Remove brake puck body with cable and brake puck retainer.

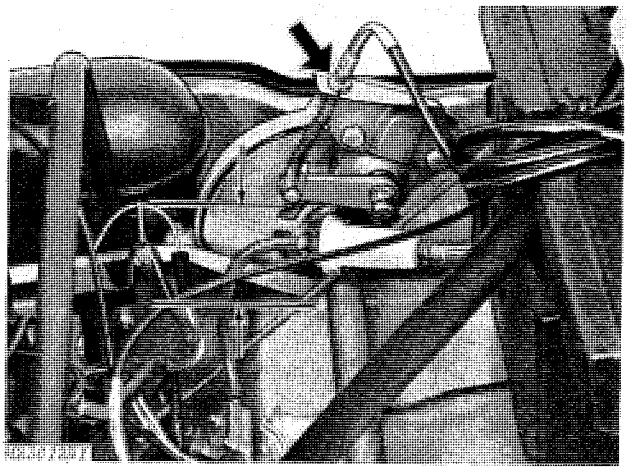
2. Loosen jam nut and back out the adjusting screw.

3. Install brake puck retainer and brake puck body with cable.

1197/5035F/000981

ADJUST BRAKE PUCKS

1. Loosen or tighten jam nuts on brake cable until arm is parallel with tunnel.

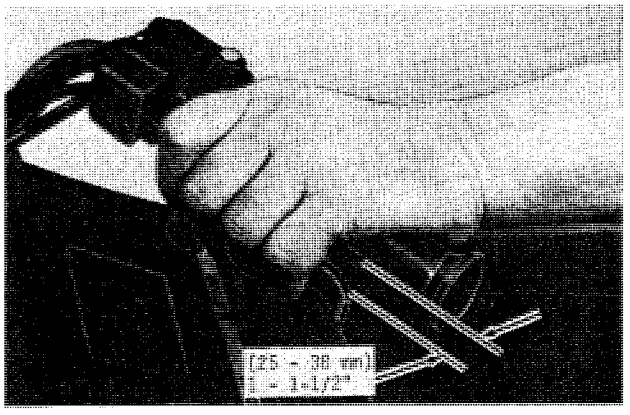


M23612/1197/5035G/250981

2. Turn adjusting screw in until a (25 to 38 mm) 1 to 1-1/2-inch clearance exists between the brake lever and the hand-grip.

3. Tighten jam nut securely.

4. After brake adjustment, check stop light operation.



M23613/1197/5035H/250981

SPECIFICATIONS

Drive Belt Total Width	(31.75 mm) 1-1/4 in.
Drive Belt Effective Length	(1175.62 ± 6.35 mm) 46.30 ± 0.25 in.
Drive Sheave Alignment	See Group 25

1197/5040A/250981

TORQUE FOR HARDWARE

Location	Torque
Drive Sheave Retaining Cap Screw	(68 N·m) 50 ft-lbs
Driven Sheave Retaining Cap Screw	(27 N·m) 20 ft-lbs

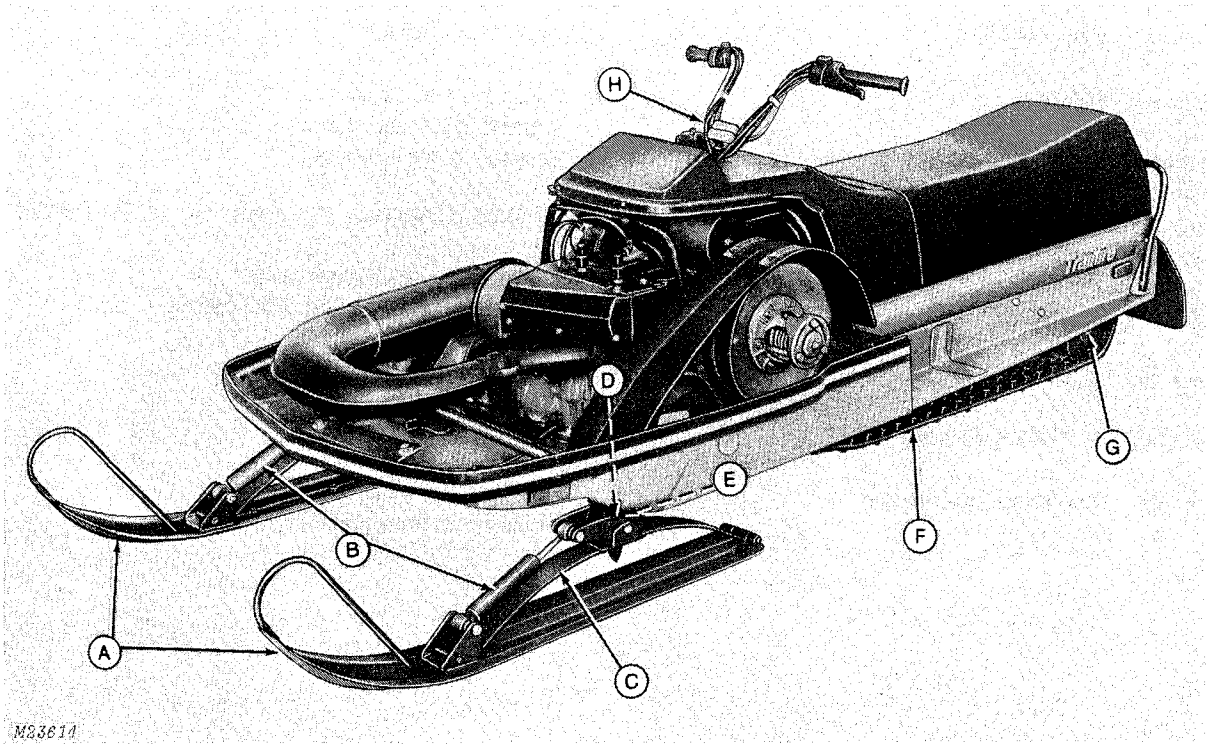
1197/5040B/250981

Section 60
SUSPENSION

CONTENTS

1197/6005A/250981

DESCRIPTION



A—Skis
B—Shock Absorbers
C—Ski Spring
D—Steering Arm
E—Ski Spindle
F—Slide Suspension
G—Rear Idler Assembly
H—Steering Post

The suspension system consists of the skis and steering mechanism, track and slide suspension. The system has replaceable wear bars, adjustable suspension springs and hydraulic shock absorbers.

The track has riveted steel grouser bars which are replaceable.

The skis have replaceable wear rods and wear plates. The ski spindles are mounted in replaceable bearings. The tie rod ends are color-coded; silver color indicates right-hand threads, gold color indicates left-hand threads.

M23614/1197/6005B/250981

DIAGNOSE MALFUNCTIONS

TRACK EDGE FRAYED

Track out of alignment.

TRACK GROOVED ON INNER SURFACE

Track run too tight.
Rear idler shaft bearings frozen.

TRACK DRIVE RACHETING

Track too loose.

REAR IDLERS TURNING ON SHAFT

Rear idler shaft bearings frozen.

LOOSE STEERING

Tie rod ends loose.
Spindle bushings worn.
Spindle splines stripped.

SKIS NOT TURNING EQUALLY IN BOTH DIRECTIONS

Tie rod adjusted improperly.
Steering arms installed improperly.

RAPID SKI WEAR

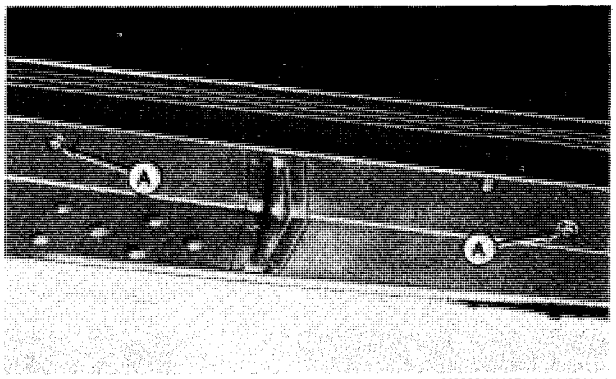
Skis out of alignment.
Wear rods worn out.
Spring wear plate worn out.
Running in marginal snow cover.

1197/6005C/250981

REMOVE SUSPENSION

1. Remove suspension retaining bolts (A) from each side of tunnel. Remove rear bolts first.

Remove upper tunnel idler wheels.

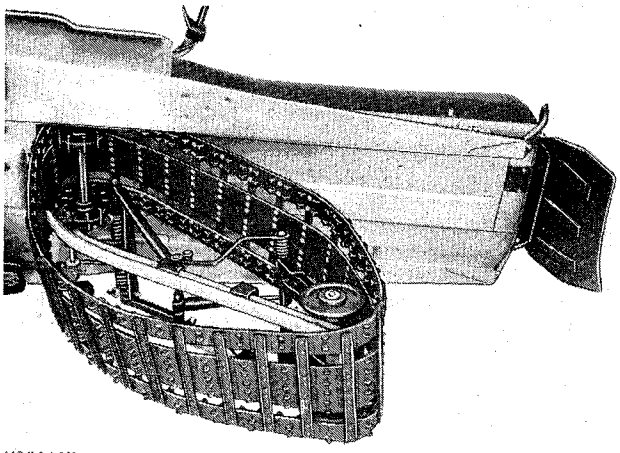


M29296/1197/6010A/250981

2. Turn the snowmobile on its right side and remove the suspension.

IMPORTANT: Siphon all fuel from the tank to prevent spillage when snowmobile is on its side.

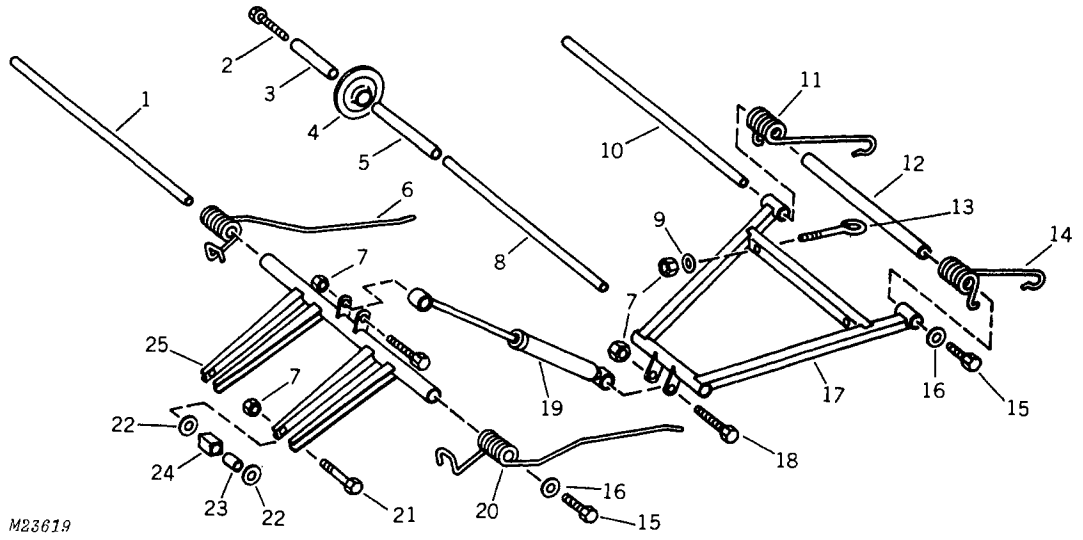
CAUTION: Gasoline is dangerous, even when mixed with oil. Avoid fire due to smoking or careless maintenance practices.



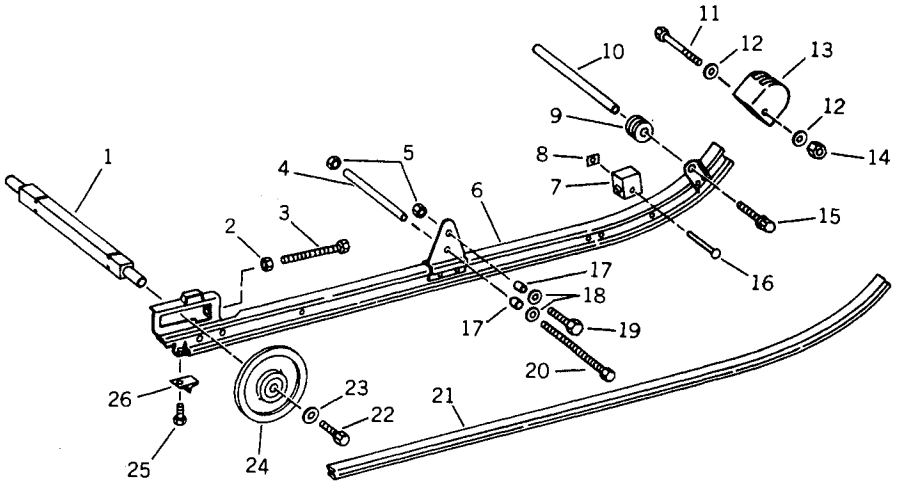
M23616Y

M23616/1197/6010B/250981

DISASSEMBLE AND REPAIR SLIDE SUSPENSION



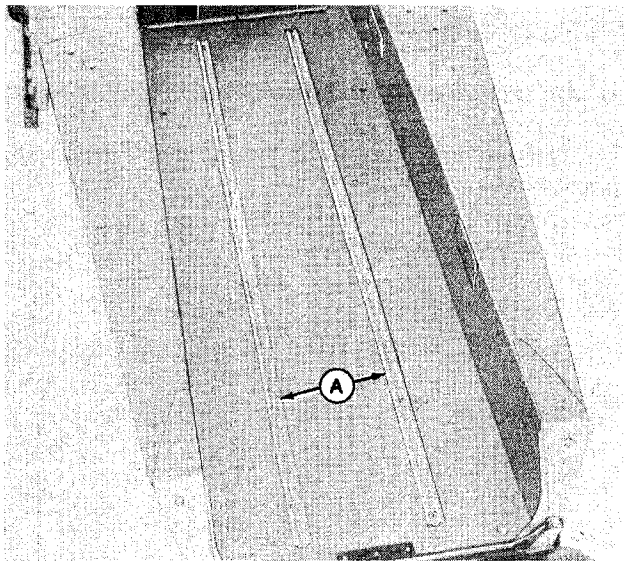
1—Pivot Shaft
2—Screw (2 used)
3—Spacer (2 used)
4—Bogie Wheel (2 used)
5—Spacer
6—L.H. Rear Spring
7—Lock Nut (6 used)
8—Axle
9—Washer (2 used)
10—Pivot Shaft
11—L.H. Front Spring
12—Hinge Tube
13—Eye Bolt (2 used)
14—R.H. Front Spring
15—Locking Bolt (4 used)
16—Washer (4 used)
17—Front Swing Arm
18—Bolt (2 used)
19—Shock Absorber
20—R.H. Rear Spring
21—Cap Screw (2 used)
22—Washer (4 used)
23—Bushing (2 used)
24—Slip Bearing (2 used)
25—Rear Pivot Arm



1—Axle
2—Nut (2 used)
3—Cap Screw (2 used)
4—Spacer
5—Lock Nut (3 used)
6—Slide Rail
7—Bumper (4 used)
8—Push Nut (4 used)
9—Bearing (2 used)
10—Bearing Shaft
11—Cap Screw (2 used)
12—Washer (4 used)
13—Cap (2 used)
14—Lock Nut (2 used)
15—Bolt (2 used)
16—Truss Rivet (4 used)
17—Spacer (4 used)
18—Washer (4 used)
19—Cap Screw (2 used)
20—Cap Screw
21—Wear Bar (2 used)
22—Cap Screw (2 used)
23—Washer (2 used)
24—Idler Wheel (2 used)
25—Cap Screw (2 used)
26—Wear Bar Stop (2 used)

M23619 M23620/1197/6010C/290981

REPLACE TUNNEL WEAR BARS (Serial No. 95,001-120,000)



NOTE: Wear bars are standard on Trailfire Snowmobiles (Serial No. 95,001-120,000). Wear bars must be added to Trailfire Snowmobiles (Serial No. 120,001-) when studs are added to the track.

1. Remove seat and fuel tank.

CAUTION: Gasoline is dangerous, even when mixed with oil. Avoid fire due to smoking or careless maintenance practices.

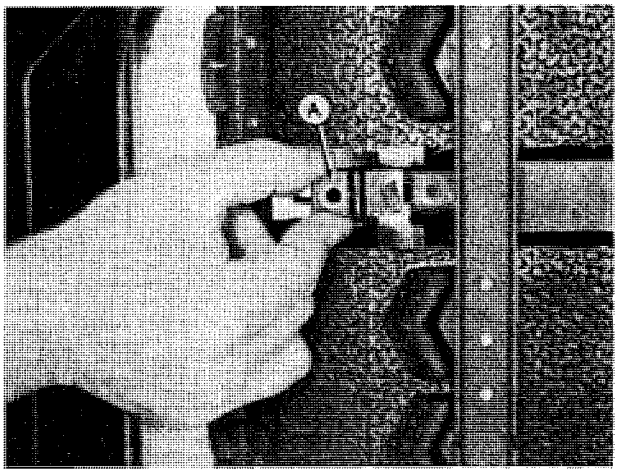
2. Remove slide suspension and upper idler wheels.
3. Lay track over front of machine.
4. Drill and chisel off old rivets from the top side.
5. Cut new bars to length and install.

NOTE: Install all rivets from the top side.

6. Install suspension, upper idler wheels, fuel tank and seat.

M29297/1197/6010D/290981

REMOVE SLIDE SUSPENSION WEAR BAR



1. Lay snowmobile carefully on its side.
2. Remove wear bar retainer (A) from rear of slide rail.
3. Loosen track tension.
4. Rotate track until wear bar lines up with opening at rear of snowmobile.
5. Drive wear bar from slide rail with a hammer and cold chisel.

NOTE: When wear bar is worn through to the slide rail it may be necessary to remove suspension to replace wear bars.

M29333/1197/6010E/011081

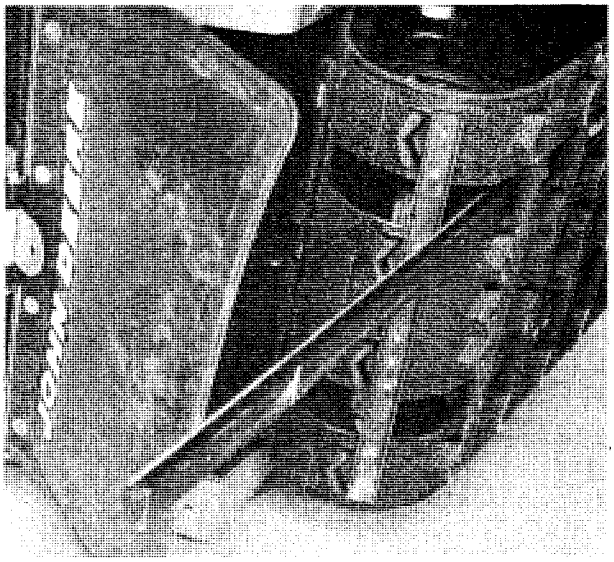
REPLACE WEAR BAR

1. Lubricate slide rail and wear bar with liquid soap solution.

2. Slide new wear bar in from the rear and drive in place with a soft mallet.

3. Install wear bar retainer.

4. Adjust track tension.



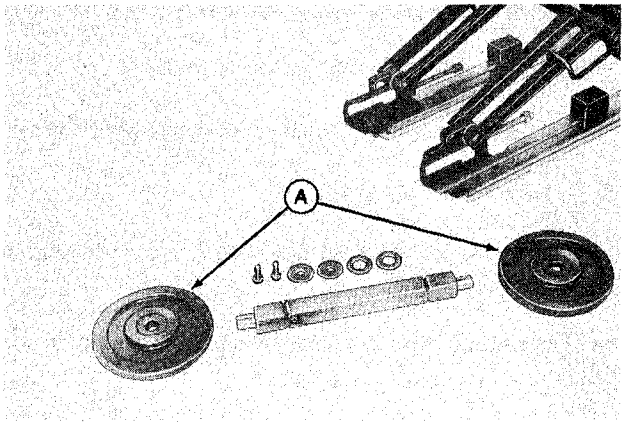
M29334/1197/6010E1/290981

REPLACE REAR IDLER WHEELS AND AXLE

1. Remove suspension.

2. Remove cap screws, idler wheels (A) and washers from each end of rear axle shaft.

3. Loosen both adjusting screws and slide rear axle forward. Remove axle through square hole in slide rail.



M29298/1197/6010F/290981

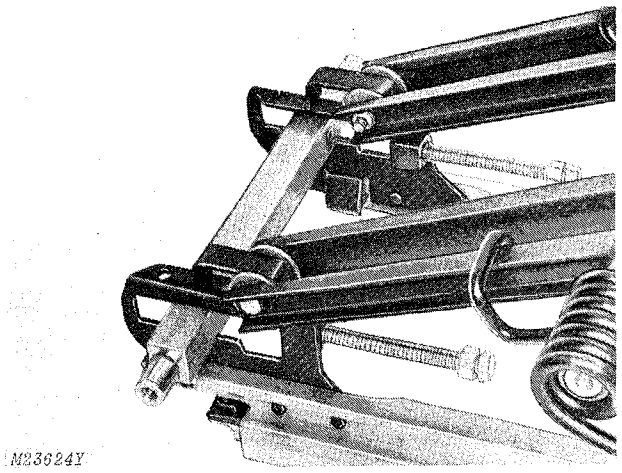
4. To reassemble: Place rear axle through slide rail with holes in axle facing forward. Be sure grooves in axle fit slide rail correctly.

5. Partially tighten both adjusting screws.

6. Install washer, idler wheel, washer and cap screw on each end of axle.

NOTE: Use Loctite on each cap screw.

7. Install suspension.



M23624Y

M23624/1197/6010G/290981

ADJUST TRACK TENSION

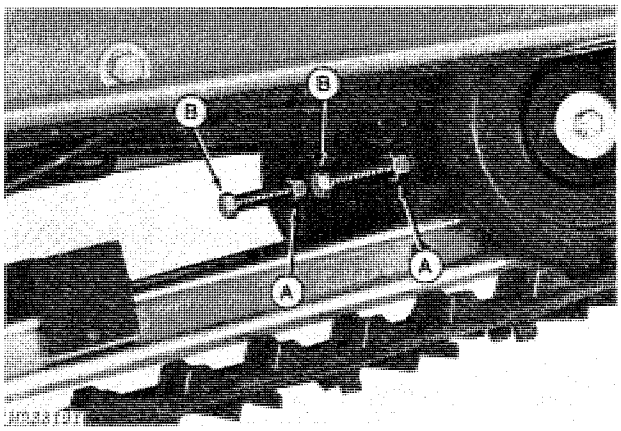
1. Support rear of snowmobile so that track is clear of ground.

2. Tension the track to give 0 to 1/4-inch (6.35 mm) clearance between the inside of track and bottom of the wear bar. Measure below shock absorber mount.

3. Adjust both sides equally using adjusting screws (B). Tighten jam nuts (A).

4. Start engine and idle track slowly until it rotates several times.

5. Shut off engine and allow track to coast to a stop. DO NOT APPLY BRAKE.



M23319/1197/6010H/290981

Check alignment as follows:

1. Rear idler wheels should run in center of drive lugs.

2. Slide wear bar should be in center of slide rail opening on each side of track.

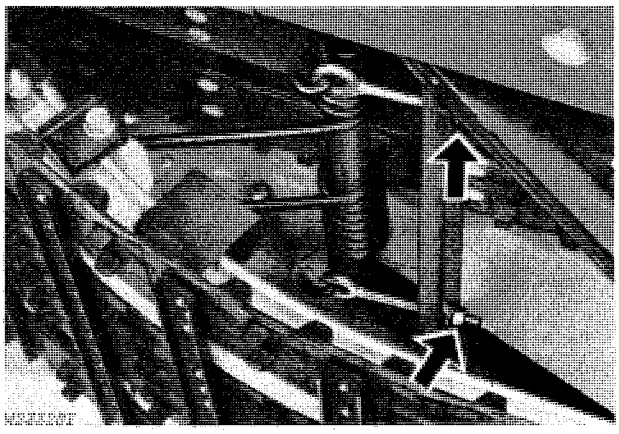
3. If either Step 1 or 2 is off, retention track.

NOTE: Track will run to the loose side. For example, if the track is too far to the left side, tighten the left side to move the track to the right.

4. Run track again to recheck.

1197/6010I/290981

ADJUST SUSPENSION SPRINGS



Ride the snowmobile to determine spring adjustments.

1. Turn adjusting nuts counterclockwise to reduce tension or clockwise to increase tension.

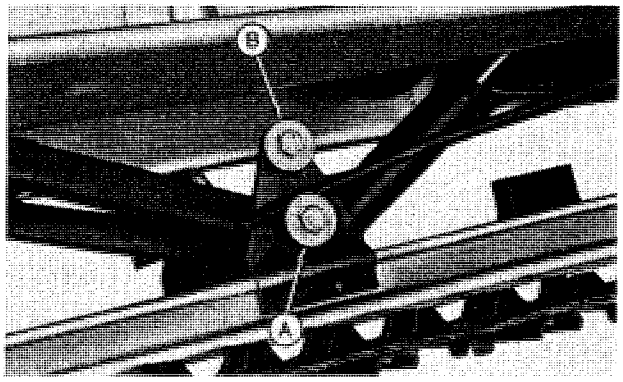
2. In deep snow (for more lift) increase tension. In light snow (for more steering control) reduce tension.

IMPORTANT: Never turn adjusting nuts all the way out. Each screw must protrude at least (12.7 mm) 1/2 inch through its respective adjusting nut.

M23320/1197/6010J/290981

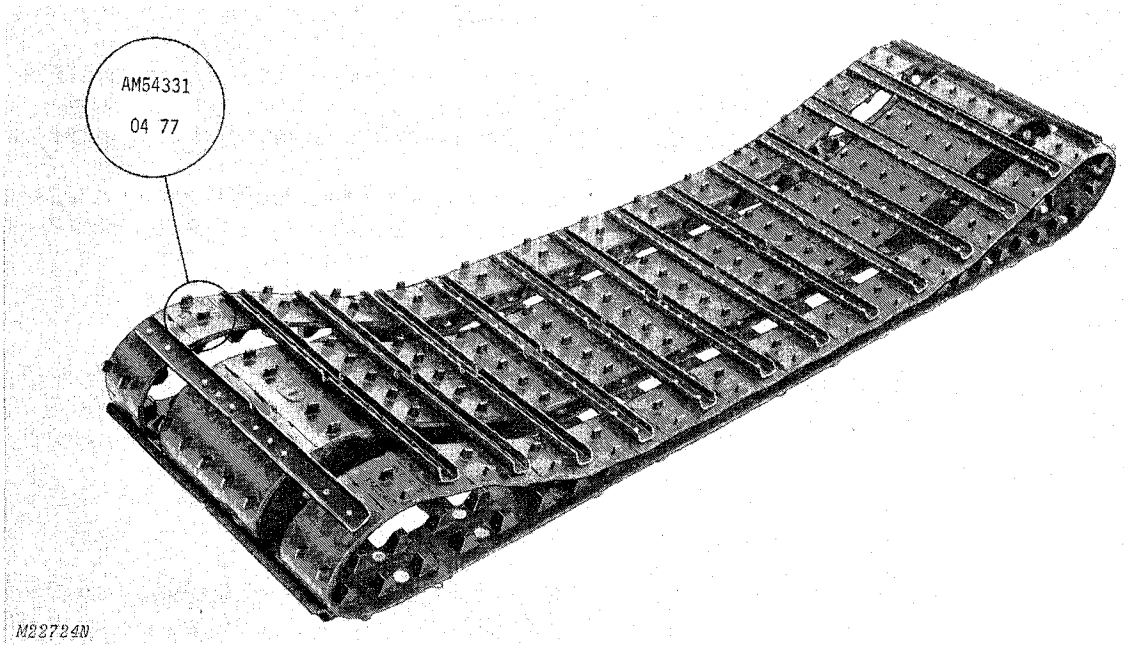
3. If suspension bottoms frequently, increase rear spring preload.

4. Move springs from bottom position (A) to top position (B) to increase spring preload.



M23321/1197/6010K/280981

WARRANTY FAILURES



PLY SEPARATION

Ply separation is a parting of the rubber from the tensile cords on any of the three belts.

TRACK STRETCH

Track stretch occurs on a used track. Track stretch is first noticed by lack of adjustment on the track-adjusting screws. Remove the track and lay it flat. Measure ten pitches on the track. This distance should not exceed (56.12 cm) 22.15 inches.

NOTE: A pitch is the distance (center-to-center) from one drive lug to the other.

M22724/1197/6015A/290981

NON-WARRANTY FAILURES

OBSTRUCTION DAMAGE

Cuts, slashes or gouges in the track are caused by broken glass, sharp rocks or buried steel. Damage occurs during rapid acceleration or side-skidding over foreign objects.

If the grouser bar is bent, broken, cracked or torn from the track due to buried objects, obstructions or road hazards, neither repair nor replacement will be considered for warranty.

When the grouser bar is torn from the track, rubber will tear away and adhere to the bar.

WORN GROUSER BARS

Grouser bars wear from operating on rough, dry terrain, railroads and highway roadsides, gravel roads and other non-approved snowmobile field conditions.

The slide wear bar becomes hot. Sand, dirt and grit become imbedded in the bar causing wear on the grouser bars. The slide wear bars must be replaced when this condition occurs.

LUG DAMAGE

Lug damage to the sides or rear edges of the drive lug is usually caused by lack of snow lubrication. Excessive track tension and dirt or soil (summer operating conditions) in the drive mechanism can also cause lug damage.

RACHETING DAMAGE

Racheting damage to the top of the lugs is caused by loose track tension, pulling too great a load, or frequent prolonged periods of rapid acceleration.

OVER-TENSION DAMAGE

Too much track tension causes excessive friction between the slide wear bars and the grouser bars. The wear bars will melt and adhere to the grouser bars.

The first indication of this condition is that the track may "stick" or "lock-up", causing loss of engine horsepower.

EDGE DAMAGE

Edge damage is the operator's fault. The most frequent cause is tipping the snowmobile on its side to clear the track, allowing the track to come in contact with an abrasive surface.

BROKEN GROUSER BARS

Grouser bar breakage is normal and expected in the center belt of the track. Grouser bars are "notched" to determine the fatigue area for breakage. If the grouser bar breaks but remains secure to the track, it is not necessary to replace the grouser bar.

LOOSE TRACK DAMAGE

Operating a track too loose causes the outer edge to flex too much resulting in cracks in the outer belts. Some wear on the driving lugs will also occur. Riding double (excessive weight) can also cause the track to flex and break the edge.

IMPACT DAMAGE

Impact damage will cause the rubber on the tread side to open up exposing the cords. This may happen in more than one place.

1197/6015A1/250981

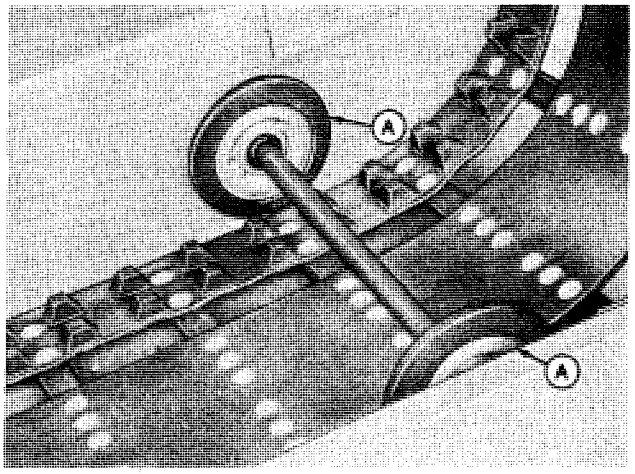
REMOVE TRACK

1. Siphon fuel from tank.

2. Remove chain case cover, chain tensioner, sprockets and drive chain.

3. Remove suspension.

4. Remove upper tunnel idler wheels (A).

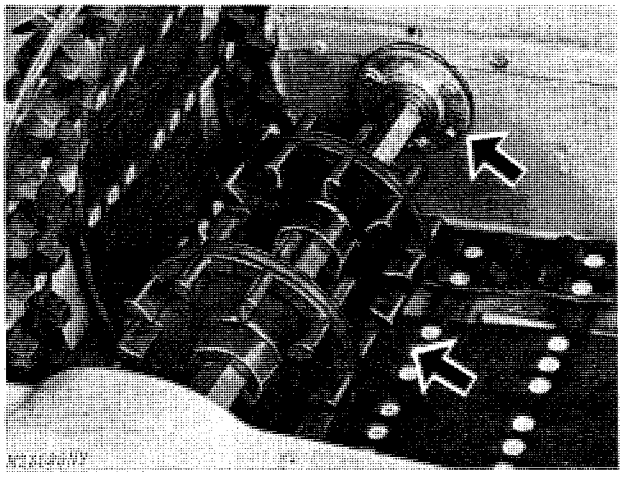


M29299/1197/6015B/290981

5. Remove bolts securing drive wheels to drive shaft.

6. Move drive wheels toward center of shaft as shown.

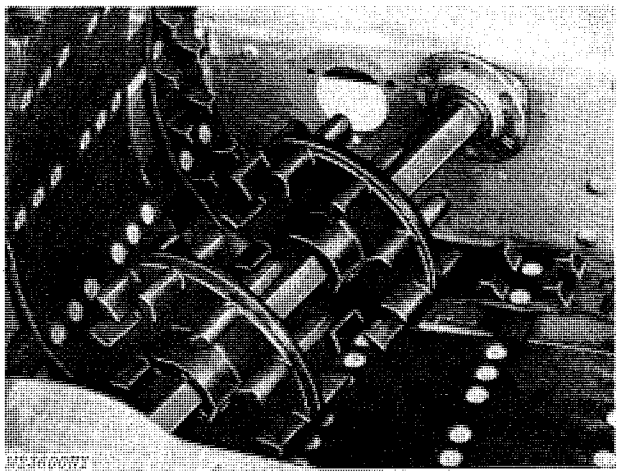
7. Remove cap screws securing bearing flangettes to tunnel.



M23599/1197/6015C/290981

8. Move drive shaft toward chain case side. Lift end with spacer to remove shaft.

9. Remove track.



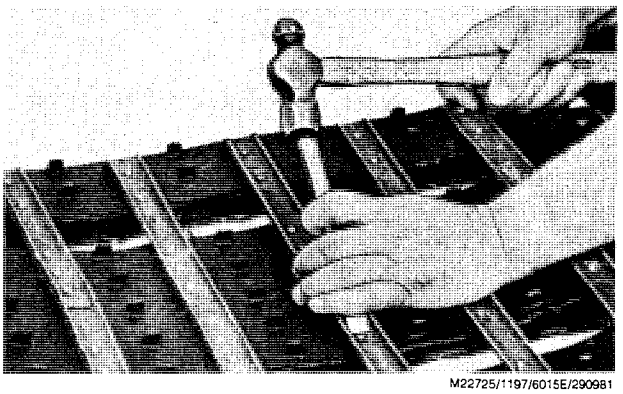
M23600/1197/6015D/290961

REPAIR TRACK

NOTE: Bent or broken grouser bars can be replaced individually. If a grouser bar is broken in the center, but still securely attached to the belts, it does not have to be replaced.

1. Use a hammer and cold chisel to remove grouser bar rivets.

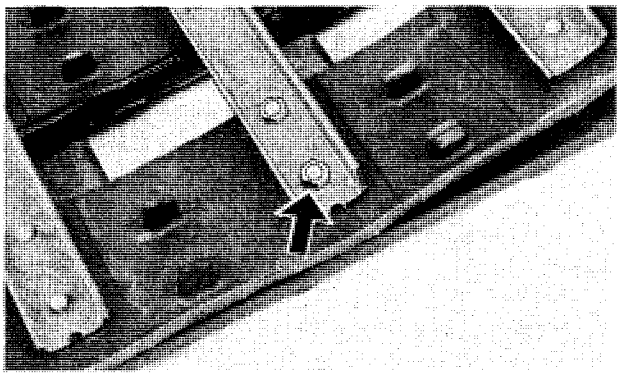
2. Position new grouser bar.



M22725/1197/6015E/290981

3. Install bolts from the inside (drive lug side of the track) with nut to the outside.

4. Tighten nuts securely and then peen the bolt tight against the nut.



M22726/1197/6015F/290981

INSTALL TRACK

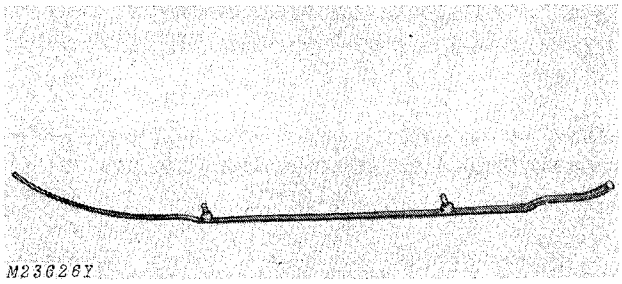
1. Place track in tunnel.
2. Install upper tunnel idler wheels.
3. See Section 50-30 for drive shaft, chain case sprockets, drive chain and chain tensioner installation.
4. Adjust track tension. See Section 60-10.
5. Fill chain case with SAE 90 oil.
6. Fill fuel tank.

1197/6015G/290981

ANALYSIS

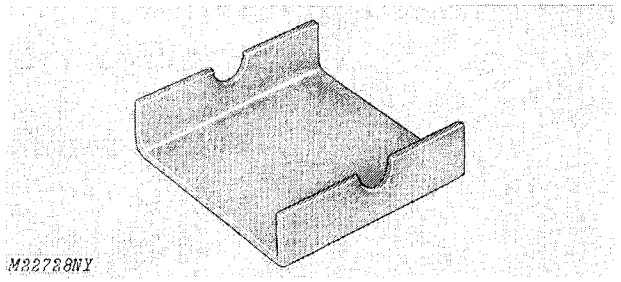
CAUTION: Worn, bent or damaged ski and steering components are unsafe.

Replace wear rods if worn. Worn wear rods are unsafe because they cause a loss of snowmobile maneuverability.



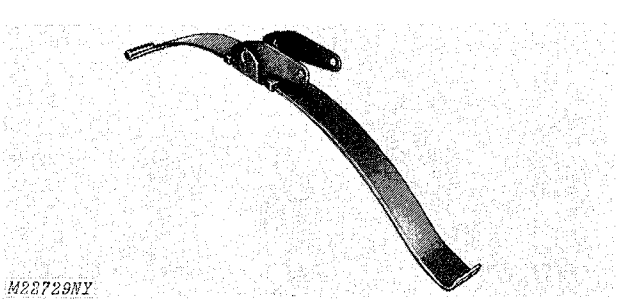
M23626/1197/6020A/290981

Replace ski wear plates if worn or damaged. If a worn wear plate is not replaced, the ski spring will wear through the ski.



M22728/1197/6020B/000981

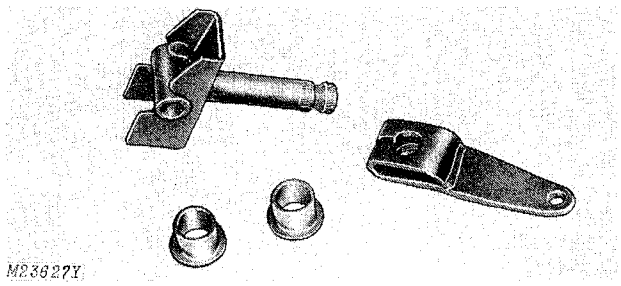
Replace ski springs if broken or damaged. A bent saddle indicates ski was subjected to severe forces and ski should be replaced. Replace ski attaching pins if worn.



M22729/1197/6020C/290981

Stripped spindle and steering arm splines indicate operation without steering arm attaching cap screws tight or improper installation of steering arm.

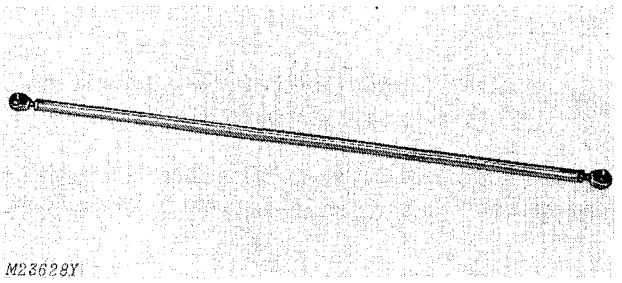
Replace ski spindle bushings if worn, cracked or damaged.



M23627/1197/6020D/290981

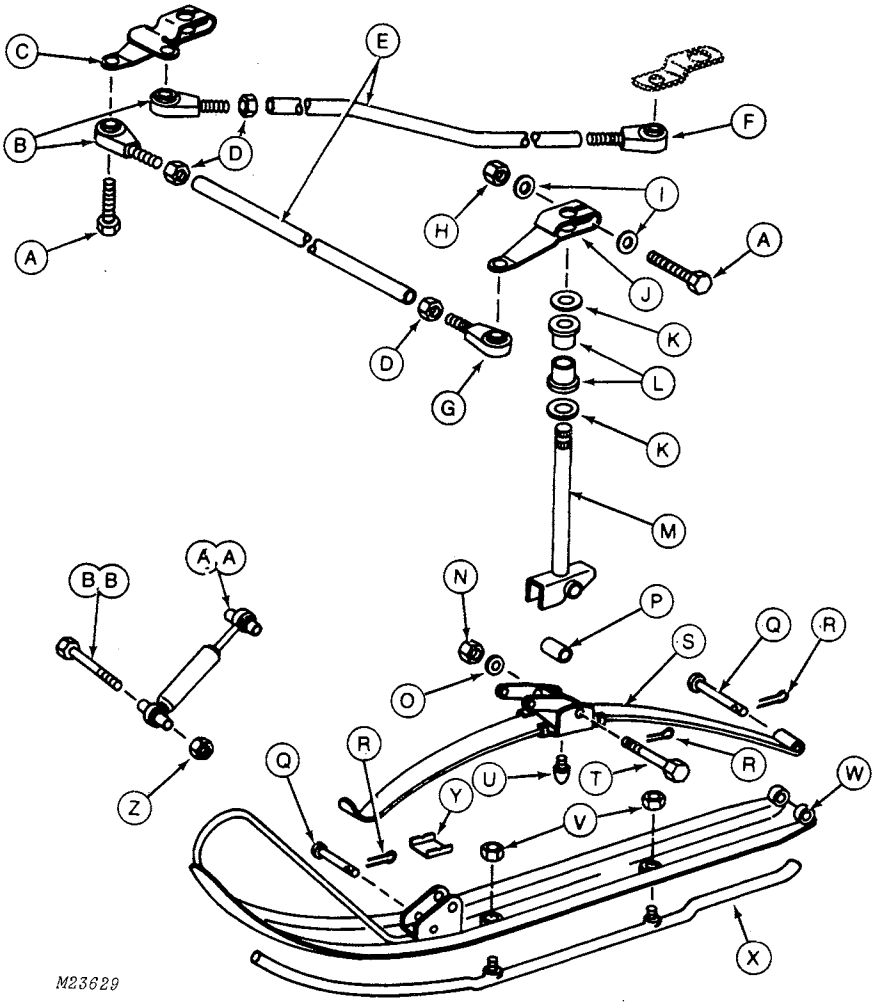
A bent tie rod indicates ski was subjected to severe forces. Replace tie rod and inspect all of the steering mechanism for damage.

Replace tie rod ends if loose. A loose tie rod end can cause erratic steering and could be a safety hazard.



M23628/1197/6020E/290981

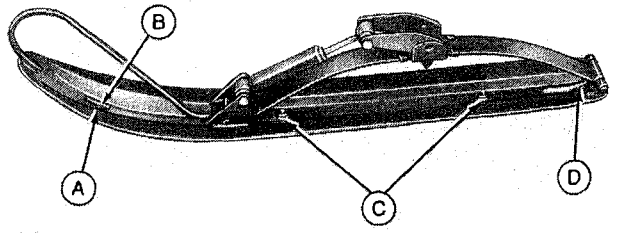
REPAIR SKIS AND STEERING



A—Cap Screw	**H—Lock Nut**	**O —Flat Washer**	**V —Flanged Lock Nut**
B—R.H. Rod End	**I —Flat Washer**	**P —Pivot Bushing**	**W —Ski**
C—Spindle Arm	**J —Spindle Arm**	**Q —Drilled Pin**	**X —Wear Rod**
D—Jam Nut	**K—Washer**	**R —Cotter Pin**	**Y —Wear Block**
E—Tie Rod	**L —Spindle Bushing**	**S —Spring Assembly**	**Z —Lock Nut**
F—R.H. Rod End	**M—Spindle**	**T —Ski Pivot Bolt**	**AA—Shock Absorber**
G—L.H. Rod End	**N—Lock Nut**	**U —Bumper**	**BB—Cap Screw**

M23629/1197/6020F/290981

REPLACE SKI WEAR RODS



M23630Y

1. Remove lock nuts (C). Pry wear rod (B) down to free studs from holes.

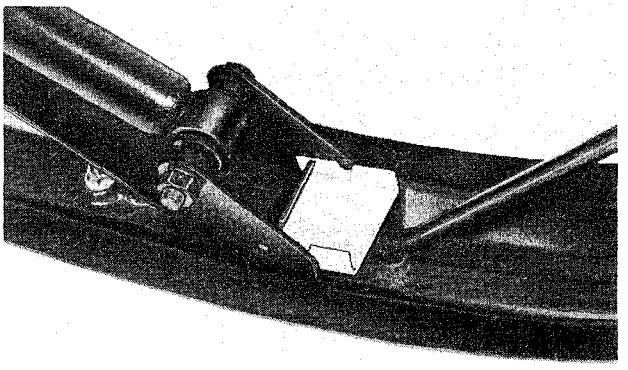
2. Slide rod forward to free rod from rear hole (D).

3. Place front of new wear rod in position through front hole (A). Slide wear rod to rear to position studs and rear of rod.

4. Install and tighten lock nuts (C).

M23630/1197/6020G/290981

REPLACE WEAR PLATES

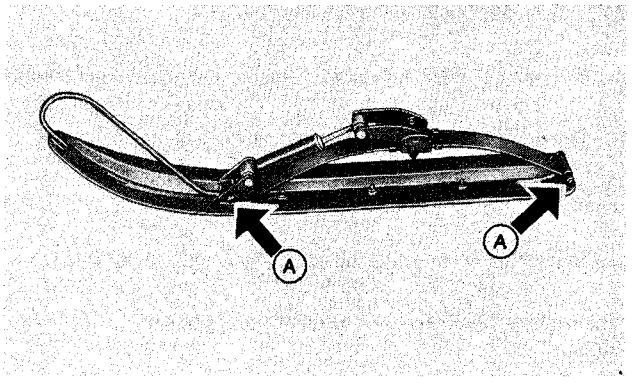

M22734/1197/6020H/290981

NOTE: Ski spring does not have to be removed to replace wear plate.

1. Remove cotter pin and drilled pin securing end of ski spring. Lift spring up and remove wear plate.

2. Install new wear plate. Position spring and install drilled pin and cotter pin.

REPLACE SKI SPRING



NOTE: The mono-leaf spring, saddle and bumper are replaced as an assembly. The bumpers can be replaced individually.

1. Remove ski from ski spindle.

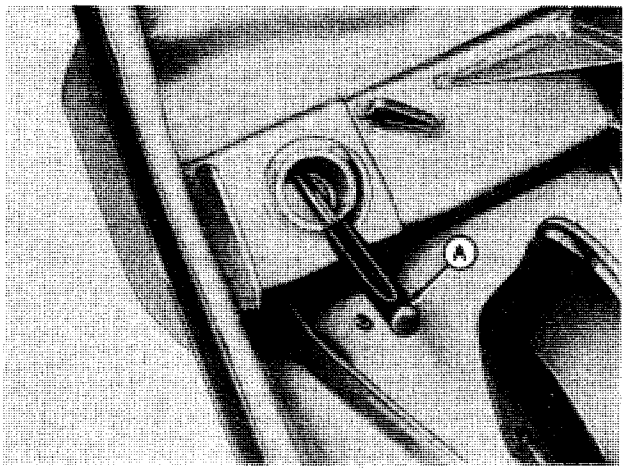
2. Remove cotter pins and drilled pins (A) securing spring assembly to the ski.

3. Install new wear plate if necessary. Install new spring assembly to ski.

4. Attach ski assembly to spindle with cap screw, washer and lock nut. Torque nut to (53 N·m) 39 ft-lbs.

M29300/1197/6020I/290981

REPLACE SKI SPINDLES AND BUSHINGS



1. Remove ski and spring assembly.

2. Remove hardware securing the steering arm to the spindle.

3. Remove the spindle.

Replace bushings as follows:

4. Use a drift punch (A) to remove bushings. Drive lower bushing out from the top. Reverse procedure to remove the upper bushing.

5. Install new bushing until it bottoms on frame. Do not crack or distort bushing during installation.

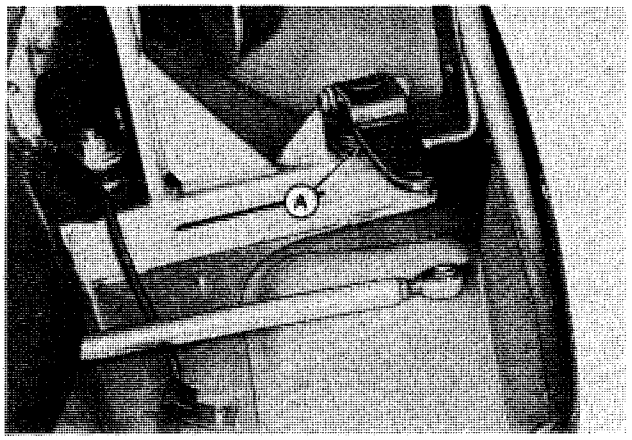
6. Install washer on spindle and install spindle from the bottom.

7. Install steering arm and upper washers if needed and secure with hardware.

8. Install ski and spring assembly. Torque nut to (53 N·m) 39 ft-lbs.

M29301/1197/6020J/290981

REPLACE STEERING ARMS



1. Position handlebars and skis to point straight ahead.

2. Disconnect tie rod from the steering arm.

3. Remove steering arm from spindle.

4. Install new steering arm (A) parallel as shown.

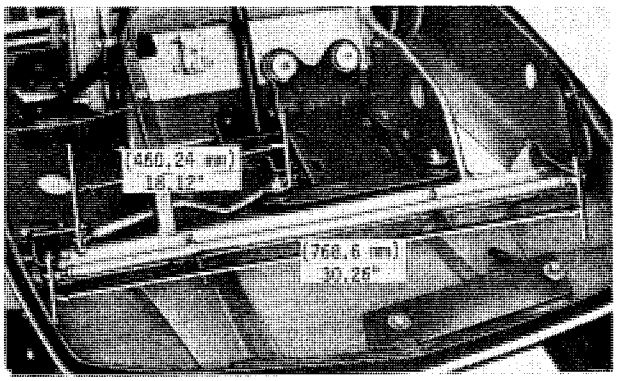
5. Secure steering arm to spindle. Torque nut to (47 N·m) 35 ft-lbs.

6. Connect tie rod and align skis.

7. Install belt guard.

M29302/1197/6020K/290981

REPLACE TIE ROD AND DRAG LINK



1. Remove tie rod from steering arms. Remove drag link from right-hand steering arm and post.

2. Install new tie rod and drag link. Connect rod gold-colored end to left-hand steering arm and silver-colored end to right-hand steering arm.

NOTE: Silver color indicates right-hand threads, gold color indicates left-hand threads.

3. Align skis.

4. Connect drag link to steering post and right-hand steering arm.

5. Adjust drag link so handlebars are pointing straight ahead.

IMPORTANT: DO NOT exceed measurements shown for drag link and tie rod lengths.

M23634/1197/6020L/290981

REPLACE TIE ROD-TO-STEERING POST NUT

IMPORTANT: If 340 Trailfire Snowmobiles (Serial No. 95,301-98,822) and 440 Trailfire Snowmobiles (Serial No. 95,044-102,100) have nut (B) attaching tie rod to steering post, remove it and replace with nut (A).

1. Remove muffler.

2. Remove front engine rubber mount bolts.

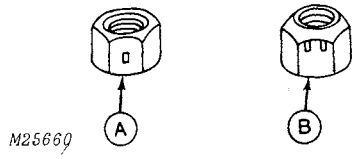
3. Lift front of engine and insert (2.54 cm) 1 inch block of wood.

4. Remove and discard lock nut (B). Degrease the bolt and install lock nut (A) with Loctite. Torque nut to (47 N·m) 35 ft-lbs.

5. Remove block of wood.

6. Reinstall engine mount hardware.

7. Install muffler.

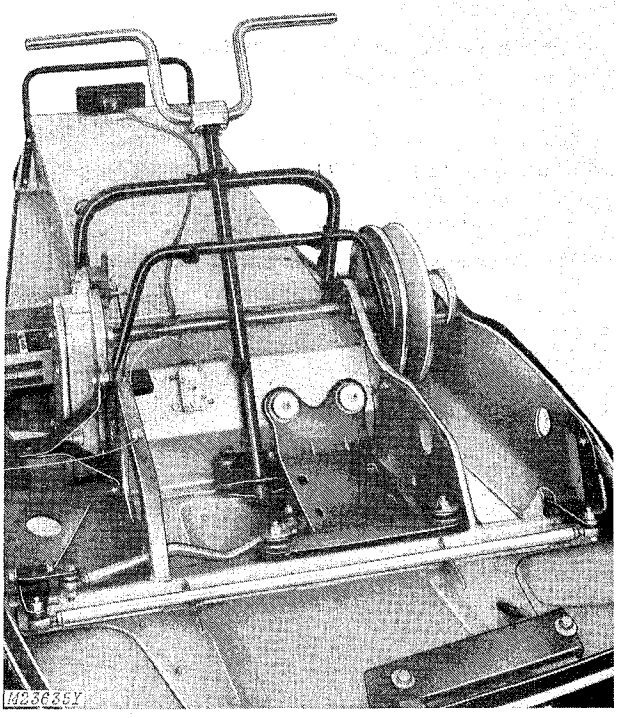


A—U13184 **B—M63440**

M25660/1197/6020M/290981

REPLACE STEERING POST

1. Remove seat and fuel tank.
2. Remove air intake silencer.
3. Remove engine. See Section 20.
4. Disconnect brake cable from brake arm and bracket.
5. Remove brake and throttle grips from handlebar.
6. Disconnect drag link from steering post.
7. Disconnect steering post bracket from tunnel.
8. Remove handlebars from steering post.
9. Install in opposite sequence.



M23635/1197/6020N/290981

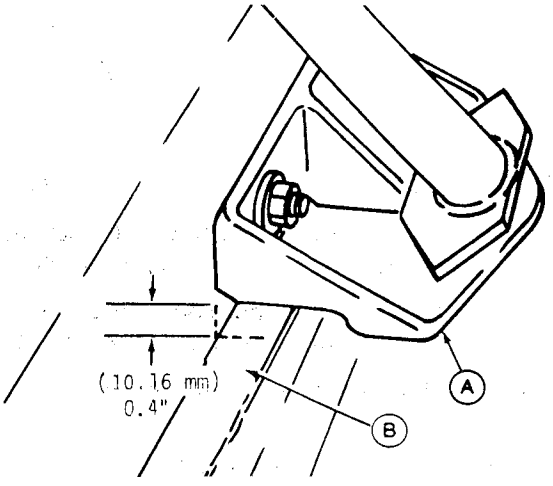
NOTE: When installing steering post mounting bracket on the tunnel (Serial No. 120,001-), bracket (A) should be (10.2 mm) 0.4 inch above ledge in pan (B). Tighten hardware.

IMPORTANT: After engine is installed, check steering post arm bolt-to-drag link clearance.

10. Check clearance as follows:
    Clearance should exist between bolt head and pan with steering in a full left-hand turn. If bolt head hits pan, move mounting bracket up.

    Clearance should exist between slotted nut and engine with steering in a full right-hand turn. If slotted nut hits engine, move mounting bracket down.

    Both clearances should be approximately equal.
11. Align skis.



M29303/1197/6020O/290981

ELIMINATE LOOSE STEERING

Two major causes of loose steering are:

1. Worn tie rod ends.

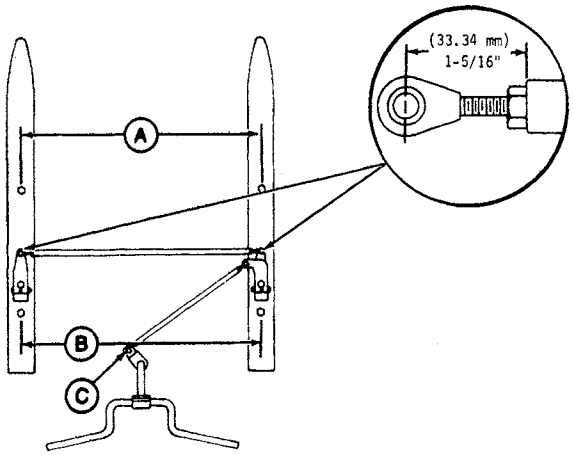
2. Worn spindle bushings

CAUTION: Check steering components and hardware frequently for condition and tightness.

Replace worn parts.

1197/6020P/290981

ALIGN SKIS



A—Front Wear Rod Nut **B—Rear Wear Rod Nut** **C—Tie Rod Bolt**

IMPORTANT: If the snowmobile has a tie rod that is adjustable on one end only, see your John Deere Dealer. The tie rod must be replaced under Modification Program M008.

The figure shows the proper position of the skis in relation to the steering arms, tie rod and steering post.

1. Raise front of snowmobile to remove weight from skis.

2. Position handlebars straight ahead.

3. Measure dimension between skis over front and rear wear rod nuts (A and B). Dimension should be equal.

4. Loosen jam nuts on each end of tie rod. Rotate tie rod to align skis.

IMPORTANT: DO NOT exceed (33.34 mm) 1-5/16 inches between tie rod and center of tie rod end.

5. Tighten jam nuts on tie rod.

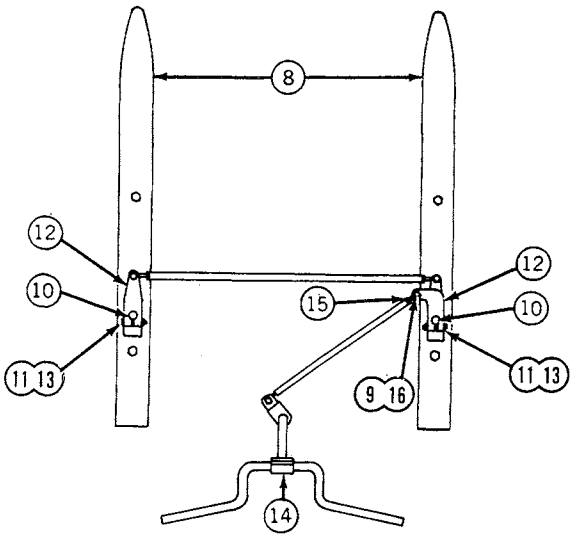
IMPORTANT: Be sure tie rod ends are still free to swivel after jam nuts are tight.

6. Adjust drag link as necessary to align handlebars.

7. Move steering handle full left and full right. Check steering for smooth operation.

IMPORTANT: If tie rod bolt (C) rubs, correct the steering linkage.

M26923/1197/6020Q/000981



M25663

8. Turn skis to point straight forward.

9. Remove tie rod end hardware.

10. Mark relationship of spindle arms to spindle.

11. Remove spindle hardware from both sides.

12. Lift both spindle arms up and reinstall them one serration counterclockwise.

IMPORTANT: Move spindle arms ONE SERRATION ONLY.

13. Reinstall spindle arm hardware.

14. Position handlebars straight ahead.

15. Thread tie rod end onto tie rod until hole aligns with hole in right-hand spindle arm.

16. Install and tighten tie rod end hardware.

17. Check steering for smooth operation, full right to full left turn.

M25663/1197/6020R/290981

SPECIFICATIONS

Drag Link-to-Steering Post	(43 to 51 N·m) 32 to 38 ft-lbs
Drag Link-to-Steering Arm	(43 to 51 N·m) 32 to 38 ft-lbs
Steering Arm-to-Spindle Bolt	(30 to 38 N·m) 22 to 28 ft-lbs
Ski Mounting Cap Screw	(52 N·m) 39 ft-lbs
Tie Rod Jam Nuts	(11 to 16 N·m) 8 to 12 ft-lbs
Tie Rod and Bearing Center Distance	(768.6 mm) 30.26 inches
Drag Link End Bearing Center Distance	(460.24 mm) 18.12 inches

1197/6025A/250981

Section 70
SERVICE TOOLS

CONTENTS

1197/7005A/290981

GENERAL

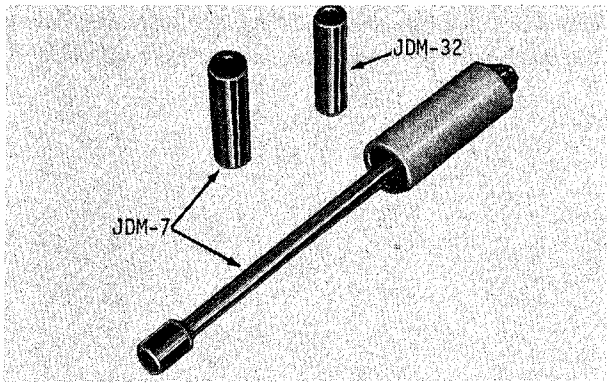
The essential tools listed in this group service the John Deere Trailfire Snowmobile. These essential tools are required for all snowmobile dealers. They can be ordered from:

Service Tool Division
Owatonna Tool Co.
P.O. Box 314
Owatonna, Minn. 55060

1197/7005A1/250981

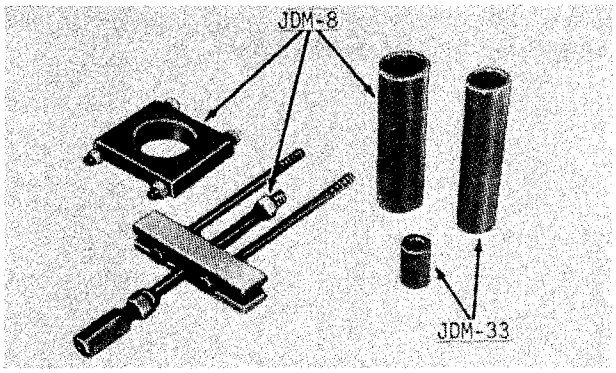
ENGINE TOOLS

JDM-7 Piston Pin Service Set, is used to remove and install piston pins.



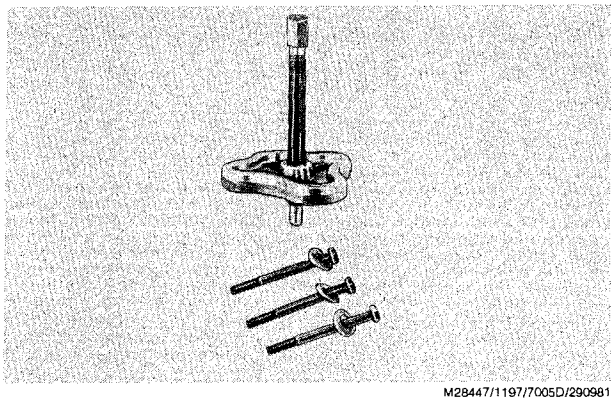
M12482/1197/7005B/250981

JDM-8 Crankshaft Bearing Service Set and JDM-33 Bearing Tool Adapter Kit, are used to remove and install the crankshaft bearings.



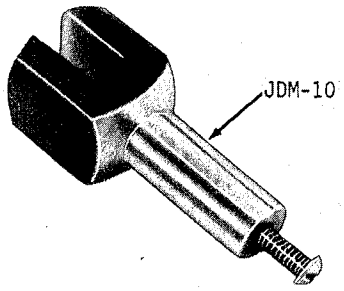
M28446/1197/7005C/250981

JDM-9 Flywheel Puller Assembly, includes metric cap screws and washers to remove the flywheel.



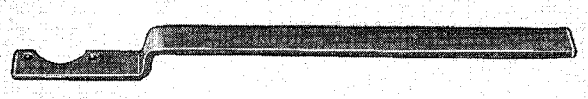
M28447/1197/7005D/290981

JDM-10 Dial Indicator Mounting Bracket, is used with JDM-15 Dial Indicator or equivalent to measure crankshaft runout.



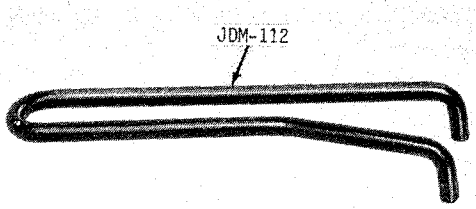
M12474/1197/7005E/290981

JDM-64-1 Flywheel Holding Tool, prevents the flywheel from rotating while removing and installing the retaining nut.



M18229/1197/7005F/290981

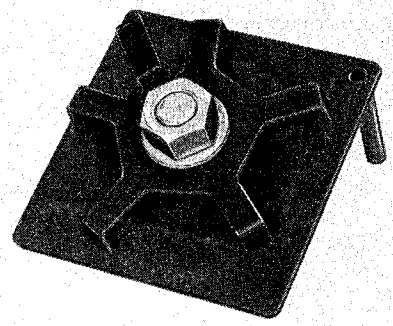
JDM-112 Fan Holding Tool is used to hold the cooling fan for assembly and disassembly procedures.



M23672Y

M23672/1197/7005G/290981

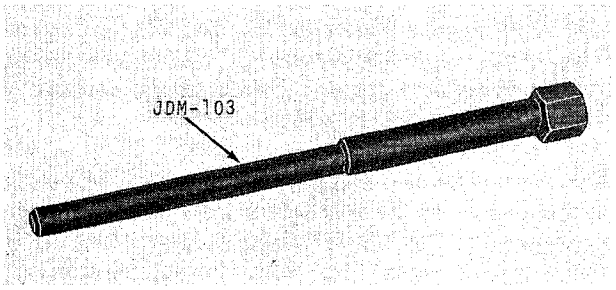
JDM-113 Starter Spring Winding Tool is used to rewind the starter spring.



M23673/1197/7005H/290981

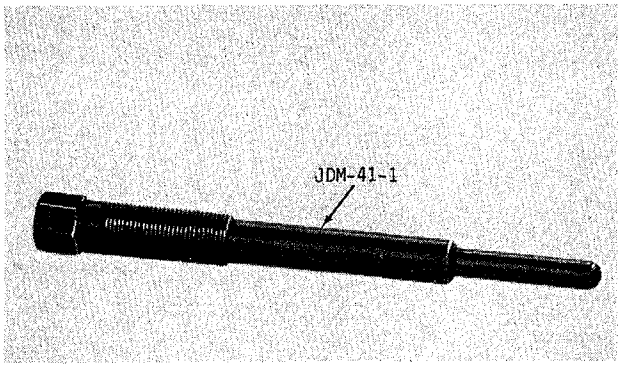
CLUTCH TOOLS

JDM-103 Clutch Puller, is used to remove and disassemble the 94C primary clutch.



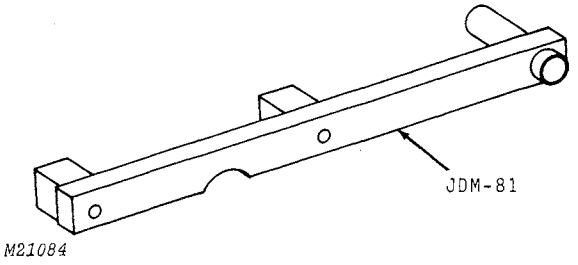
M22413/1197/7005I/290981

JDM-41-1 Clutch Puller, is used to remove the 102C clutch.



M23674/1197/7005J/290981

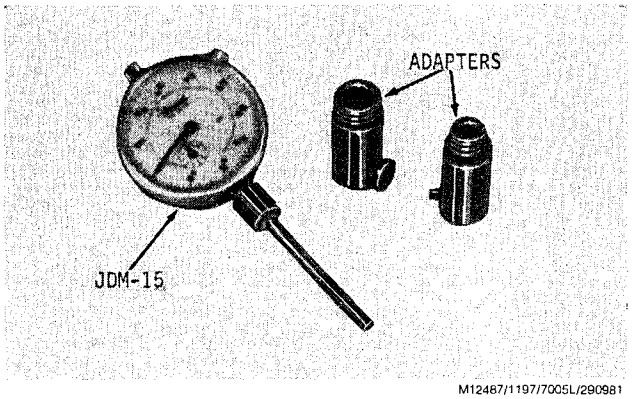
JDM-81 Clutch Aligning Tool, is used to accurately align the primary and secondary clutches. This tool checks both center distance and offset simultaneously.



M21084/1197/7005K/290981

ELECTRICAL TOOLS

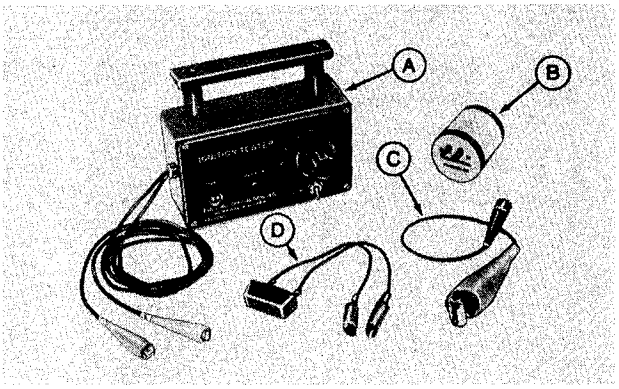
JDM-15 Snowmobile Timing Indicator, is a dial indicator graduated in 0.001-inch increments with a 1-inch range and collar for fastening into the 14 mm and 18 mm spark plug hole. The adapters are included. The indicator also can be used with the JDM-10 Mounting Bracket to measure crankshaft runout.



M12487/1197/7005L/290981

JDM-74 Capacitor Discharge Ignition (CDI) Tester, consists of the tester (A), test simulator (B), test adapter (C) and load coil (D). The tester measures peak energy output of CDI units, magneto charge and trigger impulses.

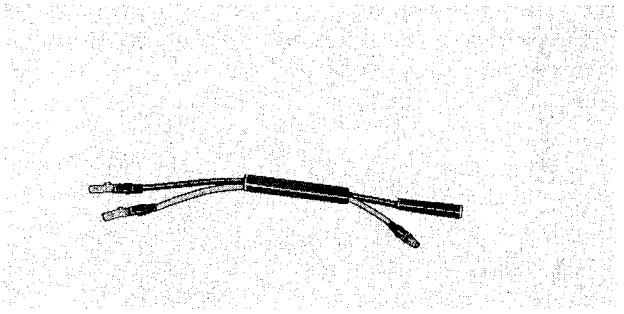
The ignition energy output is referenced against a 0-100 scale on the tester. The tester has two input ranges selected by a toggle switch. The "LOW" range senses AC or DC voltage from 0.5 to 27 volts. The "HIGH" range senses AC or DC voltage from approximately 70 to 500 volts.



A—Tester
B—Simulator
C—Adapter
D—Load Coil

M28448/1197/7005M/290981

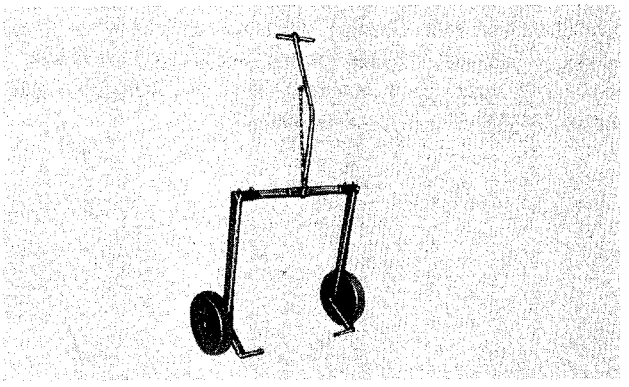
JDM-74A-6 Special Wiring Harness is used with the JDM-74 CD Tester to check magneto output, trigger impulse and CD unit output.



M23675/1197/7005N/290981

SNOWMOBILE SUPPORT TOOLS

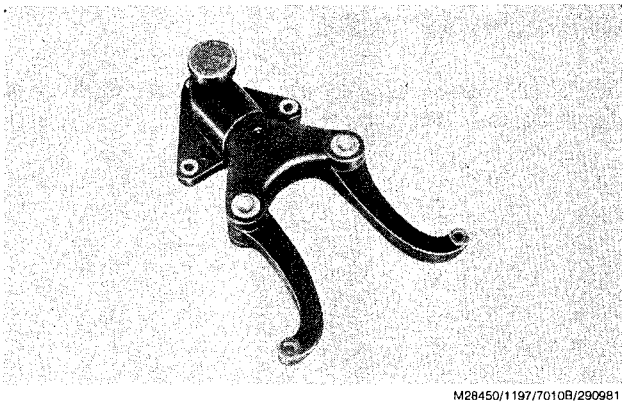
D-05024ST Snowmobile Dolly is used for moving snowmobiles in or out of the service shop or display area.



M28449/1197/7010A/290981

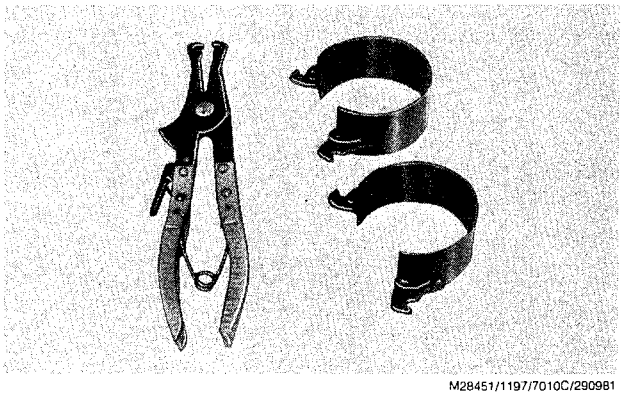
ENGINE TOOLS

JDM-16 Bench Mounted Service Fixture is used to mount all consumer product engines as well as hydrostatic units and many other components. Any component weighing 350 pounds or less may safely be rotated 360 degrees with positive stops at 90 degree increments.



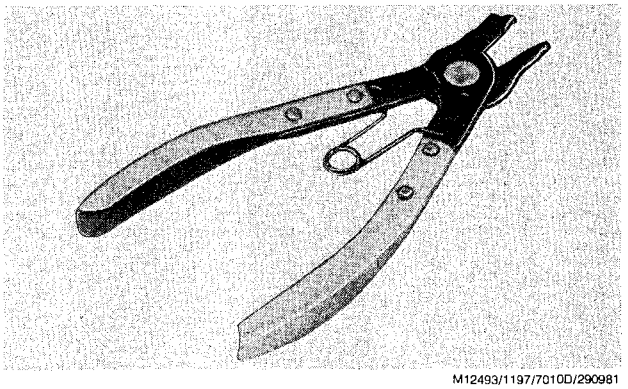
M28450/1197/7010B/290981

JDM-35 Ring Compressor is a band-type ring compressor with two adapters, usable with piston diameters of 2-1/8 inch to 2-5/8 inch.



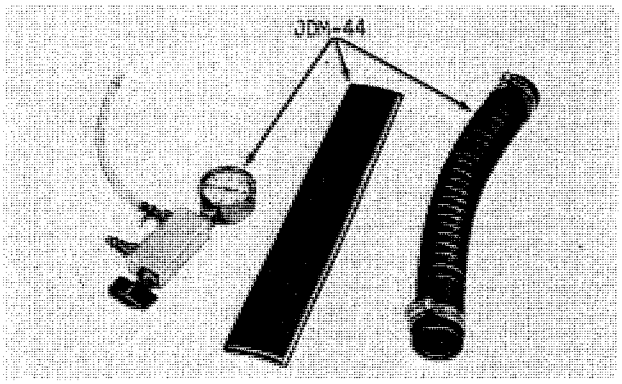
M28451/1197/7010C/290981

JDM-36 Piston Lock Ring Plier is used to install piston pin lock rings.



M12493/1197/7010D/290981

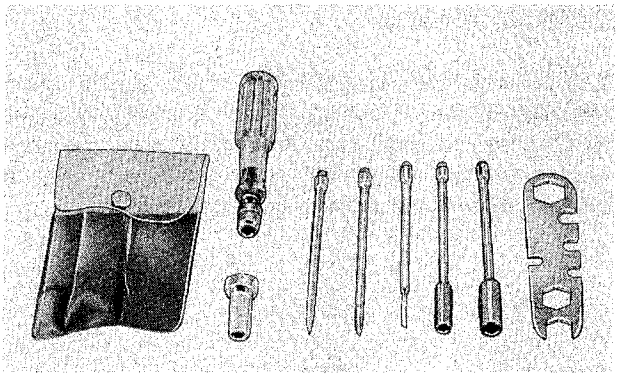
JDM-44 Pressure Testing Tool consists of a control valve, pressure gauge, rubber sheet, hoses and clamps. These items are used to seal the intake and exhaust system to pressure test the engine crankcase.



M28452/1197/7010E/290981

CARBURETOR TOOL

JDM-109A Mikuni Carburetor Tool Kit is used for making adjustments on the Mikuni Carburetor.



M25311/1197/7010F/250981