924DE, 1128DE, 1128DDE, and 1332DDE Walk-Behind Snowblowers

TECHNICAL MANUAL

John Deere
Worldwide Commercial and Consumer Equipment Division

TM1867 (12Jul00)

Litho in U.S.A

Walk-Behind Snowblowers

Model 924DE

Model 1128DE

Model 1128DDE AND 1332DDE

This technical manual is written for an experienced technician and contains sections that are specifically for this product. It is a part of a total product support program.

The manual is organized so that all the information on a particular system is kept together. The order of grouping is as follows:

- Table of Contents
- Specifications
- Component Location
- System Schematic
- Theory of Operation
- Troubleshooting Chart
- Diagnostics
- Tests & Adjustments
- Repair

Note: Depending on the particular section or system being covered, not all of the above groups may be used.

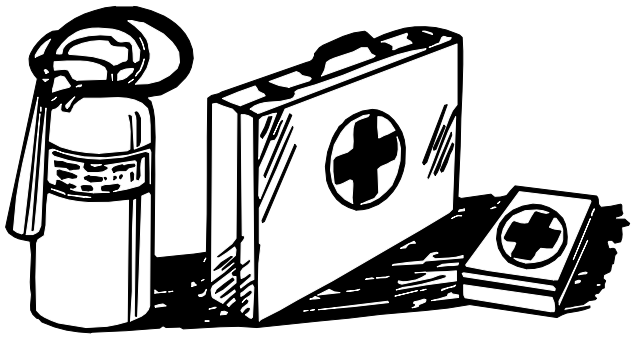
Each section will be identified with a symbol rather than a number. The groups and pages within a section will be consecutively numbered.

We appreciate your input on this manual. To help, there are postage paid post cards included at the back. If you find any errors or want to comment on the layout of the manual please fill out one of the cards and mail it back to us.

All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

HANDLE FLUIDS SAFELY-AVOID FIRES

- **BE PREPARED FOR EMERGENCIES**



When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

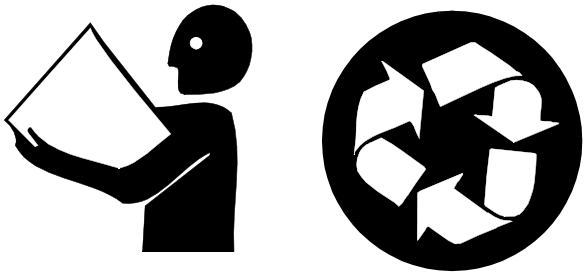
Do not store oily rags; they can ignite and burn spontaneously.

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

HANDLE CHEMICAL PRODUCTS SAFELY



Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques. Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

- **DISPOSE OF WASTE PROPERLY**

Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries. Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them. Do not pour waste onto the ground, down a drain, or into any water source. Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.

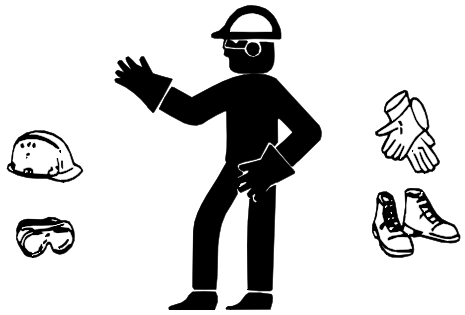
USE SAFE SERVICE PROCEDURES

- **WEAR PROTECTIVE CLOTHING**

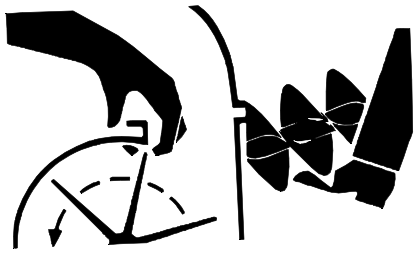
Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



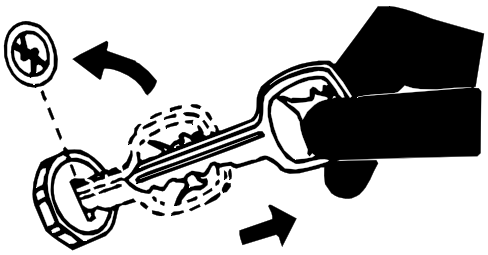
- **SERVICE MACHINES SAFELY**



- **USE PROPER TOOLS**

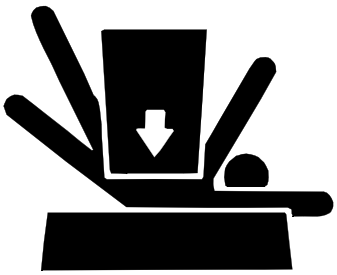
Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards. Use power tools only to loosen threaded parts and fasteners. For loosening and tightening hardware, use the correct size tools. **DO NOT** use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches. Use only service parts meeting John Deere specifications.

- **PARK MACHINE SAFELY**



- **Before working on the machine:**
  1. Lower all equipment to the ground.
  2. Stop the engine and remove the key.
  3. Disconnect the battery ground strap.
  4. Hang a “DO NOT OPERATE” tag in operator station.

- **SUPPORT MACHINE PROPERLY AND USE PROPER LIFTING EQUIPMENT**



If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles, or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.

Lifting heavy components incorrectly can cause severe injury or machine damage. Follow recommended procedure for removal and installation of components in the manual.

- **WORK IN CLEAN AREA**

- **Before starting a job**
  1. Clean work area and machine.
  2. Make sure you have all necessary tools to do your job.
  3. Have the right parts on hand.
  4. Read all instructions thoroughly; do not attempt shortcuts.

• ILLUMINATE WORK AREA SAFELY

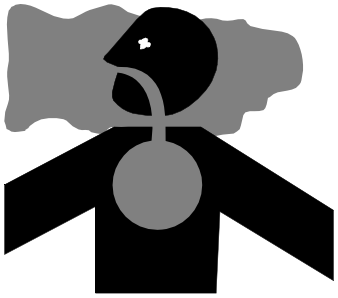
Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

• WORK IN VENTILATED AREA

WARNING: California Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.



Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

• REMOVE PAINT BEFORE WELDING OR HEATING

Avoid potentially toxic fumes and dust. Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch. Do all work outside or in a well ventilated area. Dispose of paint and solvent properly. Remove paint before welding or heating: If you sand or grind paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

• AVOID HARMFUL ASBESTOS DUST

Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

Components in products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates, and some gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos is not generated.

Avoid creating dust. Never use compressed air for cleaning. Avoid brushing or grinding material containing asbestos. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean asbestos. If not available, apply a mist of oil or water on the material containing asbestos. Keep bystanders away from the area.

• SERVICE TIRES SAFELY

Explosive separation of a tire and rim parts can cause serious injury or death.

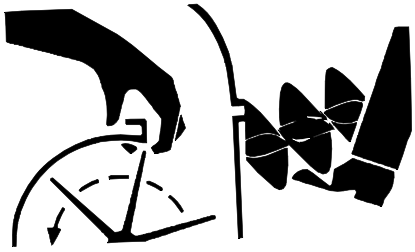
Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

• Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

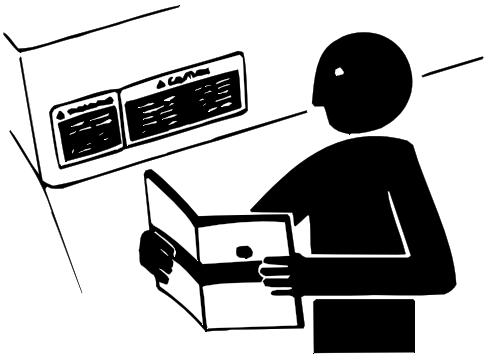
AVOID INJURY FROM ROTATING AUGERS

Keep hands and feet away from auger housing. Never try to work on auger or clear any material from auger housing while machine is running or spark plug is connected.



REPLACE SAFETY SIGNS

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.



LIVE WITH SAFETY

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.

CONTENTS

SPECIFICATIONS

	924DE	1128DE	1128DDE	1332DDE
ENGINE				
Manufacturer	Tecumseh -Snow King	Tecumseh -Snow King	Tecumseh -Snow King	Tecumseh -Snow King
Model	OHSK90	OHSK110	OHSK110	OHSK130
Type (cycle)	4 cycle	4 cycle	4 cycle	4 cycle
Horsepower	6.71 kW (9 hp)	8.20 kW (11 hp)	8.20 kW (11 hp)	9.69 kW (13 hp)
Slow Engine Idle speed	2000 ± 150 rpm	2000 ± 150 rpm	2000 ± 150 rpm	2000 ± 150 rpm
Fast Engine Idle speed	3600 ± 150 rpm	3600 ± 150 rpm	3600 ± 150 rpm	3600 ± 150 rpm
Displacement	318.46 cm^3 (19.43 cu. in.)	318.46 cm^3 (19.43 cu. in.)	318.46 cm^3 (19.43 cu. in.)	357.63 cm (21.82 cu. in.)^3
Bore - Std.	79.375 mm (3.125 in.)	79.375 mm (3.125 in.)	79.375 mm (3.125 in.)	84.125 mm (3.312 in.)
Bore - Max.	79.400 mm (3.126 in.)	79.400 mm (3.126 in.)	79.400 mm (3.126 in.)	84.150 mm (3.313 in.)
Stroke	70.993 mm (2.532 in.)	70.993 mm (2.532 in.)	70.993 mm (2.532 in.)	70.993 mm (2.532 in.)
Lubrication Type	Oil Dipper	Oil Dipper	Oil Dipper	Counterbalance Shaft
Oil capacity	0.77 L (26 U.S. oz.)	0.77 L (26 U.S. oz.)	0.77 L (26 U.S. oz.)	0.95 L (32 U.S. oz.)
Oil fill	Tube/dipstick in front of engine	Tube/dipstick in front of engine	Tube/dipstick in front of engine	Tube/dipstick in front of engine
FUEL				
Type required	Unleaded gasoline - 87 octane or higher	Unleaded gasoline - 87 octane or higher	Unleaded gasoline - 87 octane or higher	Unleaded gasoline - 87 octane or higher
Fuel tank	3.8 L (1.0 U.S. gal.)	3.8 L (1.0 U.S. gal.)	3.8 L (1.0 U.S. gal.)	3.8 L (1.0 U.S. gal.)
Fuel filter	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)
ELECTRICAL				
Ignition	Electronic Capacitor Discharge Ignition (CDI) System	Electronic Capacitor Discharge Ignition (CDI) System	Electronic Capacitor Discharge Ignition (CDI) System	Electronic Capacitor Discharge Ignition (CDI) System

Spark plug	RN4C	RN4C	RN4C	RN4C
Spark plug gap	0.762 mm (0.030 in.)	0.762 mm (0.030 in.)	0.762 mm (0.030 in.)	0.762 mm (0.030 in.)
Electric start	Standard; 120 V Electric Start Kit	Standard; 120 V Electric Start Kit	Standard; 120 V Electric Start Kit	Standard; 120 V Electric Start Kit
Starting	Standard Recoil Pull Start with Automatic Compression Release (ACR)	Standard Recoil Pull Start with Automatic Compression Release (ACR)	Standard Recoil Pull Start with Automatic Compression Release (ACR)	Standard Recoil Pull Start with Automatic Compression Release (ACR)
Alternator	18 Watt	18 Watt	3 and 5 Amp	3 and 5 Amp
Headlight	Standard	Standard	Standard	Standard

AUGER

Type	2 - Stage Serrated Steel	2 - Stage Serrated Steel	2 - Stage Serrated Steel	2 - Stage Serrated Steel
Clearing width	610 mm (24 in.)	711 mm (28 in.)	711 mm (28 in.)	813 mm (32 in.)
Housing opening (height)	406 mm (16 in.)	406 mm (16 in.)	584 mm (23 in.)	584 mm (23 in.)
Shaft Dia.	19 mm (0.75 in.)	19 mm (0.75 in.)	25.4 mm (1.0 in.)	25.4 mm (1.0 in.)
Discharge chute rotation	220 degrees	220 degrees	220 degrees	220 degrees
Blower Dia.	305 mm (12 in.)	305 mm (12 in.)	305 mm (12 in.)	305 mm (12 in.)

TIRES

Wheels	Steel	Steel	Steel	Steel
Tires	Pneumatic - Snow Hog	Pneumatic - Snow Hog	Pneumatic - Snow Hog	Pneumatic - Snow Hog
Tire size	4.80 - 8	4.80 - 8	4.80 - 8	16 x 6.50 - 8

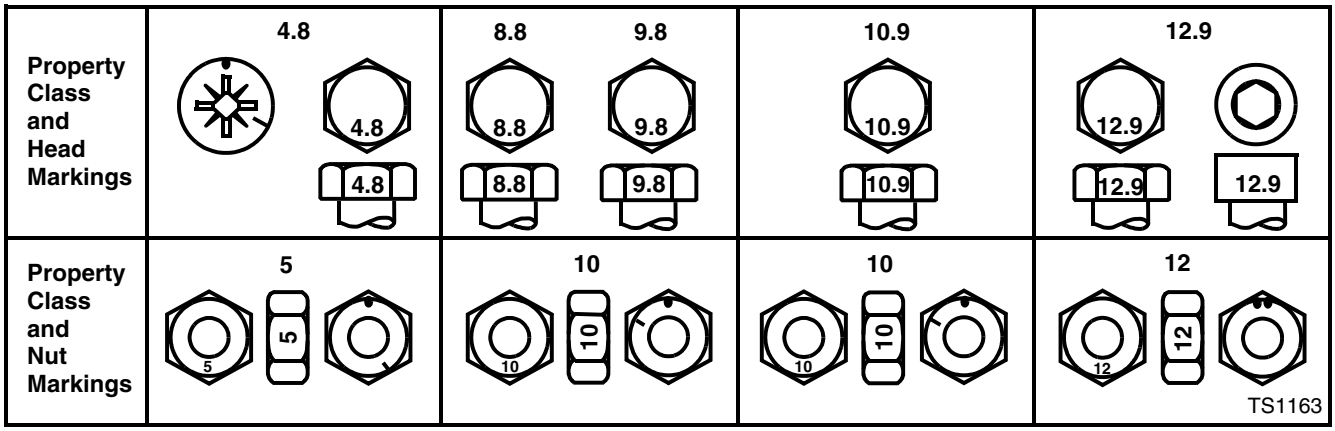
OVERALL DIMENSIONS

Length	1524 mm (60 in.)	1524 mm (60 in.)	1524 mm (60 in.)	1524 mm (60 in.)
Width	673 mm (26.5 in.)	775 mm (30.5 in.)	775 mm (30.5 in.)	876 mm (34.5 in.)
Height	1016 mm (40.0 in.)	1016 mm (40.0 in.)	1016 mm (40.0 in.)	1016 mm (40.0 in.)
Net weight	113 kg (250 lb.)	119 kg (263 lb.)	128 kg (283 lb.)	131 kg (288 lb.)

FRICTION DRIVE SYSTEM

Drive components: **Primary reduction–V-belt from engine to transmission.**
Transmission–spring loaded friction disc driven from aluminum input disk.
Gear reduction to axle shaft.

METRIC FASTENER TORQUE VALUES



	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
SIZE	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
M6	48	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	109
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

DO NOT use these hand torque values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only and include a ±10% variance factor. Check tightness of fasteners periodically. DO NOT use air powered wrenches.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Fasteners should be replaced with the same grade. Make sure fastener threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

When bolt and nut combination fasteners are used, torque values should be applied to the **NUT** instead of the bolt head.

Tighten toothed or serrated-type lock nuts to the full torque value.

[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication.*
Reference: JDS—G200.

INCH FASTENER TORQUE VALUES

SAE Grade and Head Markings	No Marks 1 or 2[b]	5 5.1 5.2	8 8.2
SAE Grade and Nut Markings	No Marks 2	5	8

TS1162

	Grade 1				Grade 2[b]				Grade 5, 5.1 or 5.2				Grade 8 or 8.2			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
SIZE	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft	N•m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

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[a] *"Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated (yellow dichromate - Specification JDS117) without any lubrication.*

[b] *"Grade 2" applies for hex cap screws (not hex bolts) up to 152 mm (6-in.) long. "Grade 1" applies for hex cap screws over 152 mm (6-in.) long, and for all other types of bolts and screws of any length.*

Reference: JDS—G200.

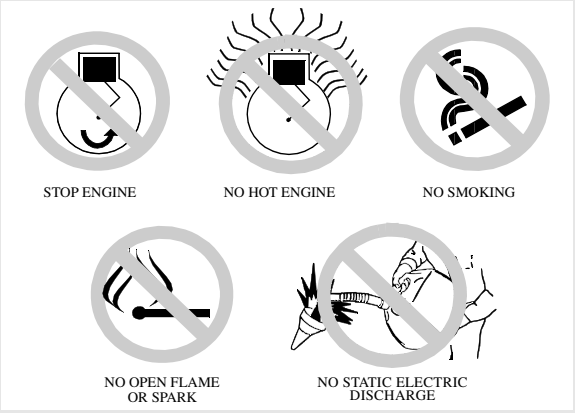
GASOLINE

⚠ CAUTION

Gasoline is HIGHLY FLAMMABLE, handle it with care.

DO NOT refuel machine while:

- **indoors, always fill gas tank outdoors;**
- **machine is near an open flame or sparks;**
- **engine is running, STOP engine;**
- **engine is hot, allow it to cool sufficiently first;**
- **smoking.**



Help prevent fires:

- **fill gas tank to bottom of filler neck only;**
- **be sure fill cap is tight after fueling;**
- **clean up any gas spills IMMEDIATELY;**
- **keep machine clean and in good repair–free of excess grease, oil, debris, and faulty or damaged parts;**
- **any storage of machines with gas left in tank should be in an area that is well ventilated to prevent possible igniting of fumes by an open flame or spark, this includes any appliance with a pilot light.**

To prevent fire or explosion caused by STATIC ELECTRIC DISCHARGE during fueling:

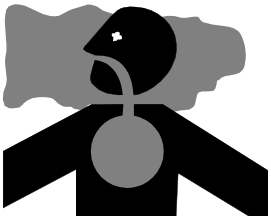
- **ONLY use a clean, approved POLYETHYLENE PLASTIC fuel container and funnel WITHOUT any metal screen or filter.**

To avoid engine damage:

- DO NOT mix oil with gasoline;
- **ONLY use clean, fresh unleaded gasoline with an octane rating (anti-knock index) of 87 or higher**;
- fill gas tank at the end of each day's operation to help prevent condensation from forming inside a partially filled tank;
- keep up with specified service intervals.

Use of alternative oxygenated, gasohol blended, unleaded gasoline is acceptable as long as:

- the ethyl or grain alcohol blends DO NOT exceed 10% by volume or
- methyl tertiary butyl ether (MTBE) blends DO NOT exceed 15% by volume.



IMPORTANT: DO NOT use METHANOL gasoline because METHANOL is harmful to the environment and to your health.

⚠ WARNING

<u>California Proposition 65 Warning:</u> Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

GASOLINE STORAGE

IMPORTANT: Keep all dirt, scale, water or other foreign material out of gasoline.

Keep gasoline stored in a safe, protected area. Storage of gasoline in a clean, properly marked **("UNLEADED GASOLINE") POLYETHYLENE PLASTIC container WITHOUT** any metal screen or filter is recommended. **DO NOT** use de-icers to attempt to remove water from gasoline or depend on fuel filters to remove water from gasoline. Use a water separator installed in the storage tank outlet. **BE SURE** to properly discard unstable or contaminated gasoline. When storing unit or gasoline, it is recommended that you add **John Deere Gasoline Conditioner and Stabilizer (TY15977)** or an equivalent to the gasoline. **BE SURE** to follow directions on container and to properly discard empty container.

ENGINE OIL

Use the appropriate oil viscosity based on the expected air temperature range during the period between recommended oil changes. Operating outside of these recommended oil air temperature ranges may cause premature engine failure.

The following John Deere oil is **PREFERRED**:

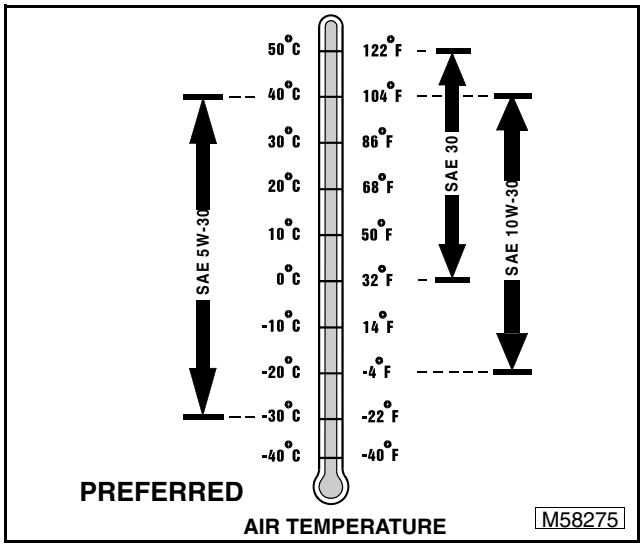
- **TORQ-GARD SUPREME®—SAE 5W-30**
- **UNI–GARD™—SAE 5W-30**

The following John Deere oils are **also recommended**, based on their specified temperature range:

- **TURF–GARD®—SAE 10W-30**
- **PLUS–4®—SAE 10W-30**
- **UNI–GARD™—SAE 10W-30**
- **TORQ–GARD SUPREME®—SAE 30**
- **UNI–GARD™—SAE 30**

Other oils may be used if above John Deere oils are not available, provided they meet one of the following specifications:

- SAE 5W-30—API Service Classification SG or higher
- SAE 10W-30—API Service Classification SG or higher
- SAE 30—API Service Classification SC or higher
- CCMC Specification G4 or higher.



ENGINE BREAK–IN OIL

IMPORTANT: ONLY use a quality break-in oil in rebuilt or remanufactured engines for the first 5 hours (maximum) of operation. DO NOT use oils with heavier viscosity weights than SAE 5W-30 or oils meeting specifications API SG or SH, these oils will not allow rebuilt or remanufactured engines to break-in properly.

The following John Deere oil is **PREFERRED**:

- **BREAK–IN ENGINE OIL**.

John Deere BREAK–IN ENGINE OIL is formulated with special additives for aluminum and cast iron type engines to allow the power cylinder components (pistons, rings, and liners as well) to “wear-in” while protecting other engine components, valve train and gears, from abnormal wear. Engine rebuild instructions should be followed closely to determine if special requirements are necessary.

John Deere BREAK–IN ENGINE OIL is also recommended for non-John Deere engines, both aluminum and cast iron types.

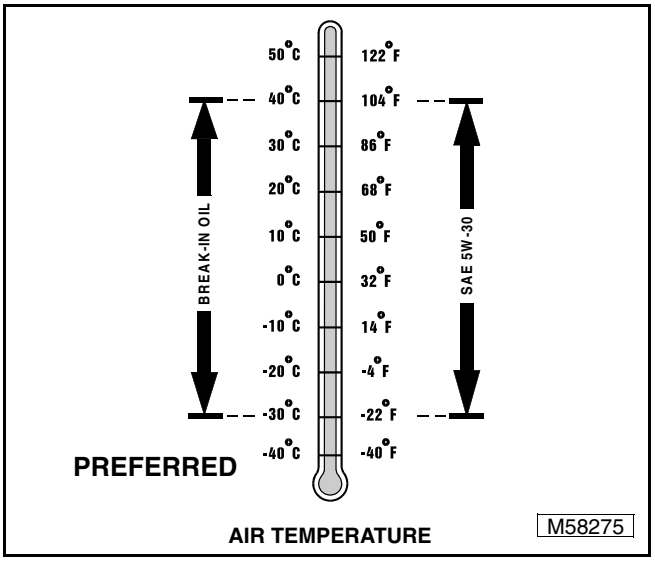
The following John Deere oil is **also recommended** as a break-in engine oil:

- **TORQ–GARD SUPREME®—SAE 5W-30.**

If the above recommended John Deere oils are not available, use a break-in engine oil meeting the following specification during the first 5 hours (maximum) of operation:

- SAE 5W-30—API Service Classification SE or higher.
- SAE 5W-30—CCMC Specification G4 or higher.

IMPORTANT: After the break-in period, use the John Deere oil that is recommended for this engine.



ANTI-CORROSION GREASE

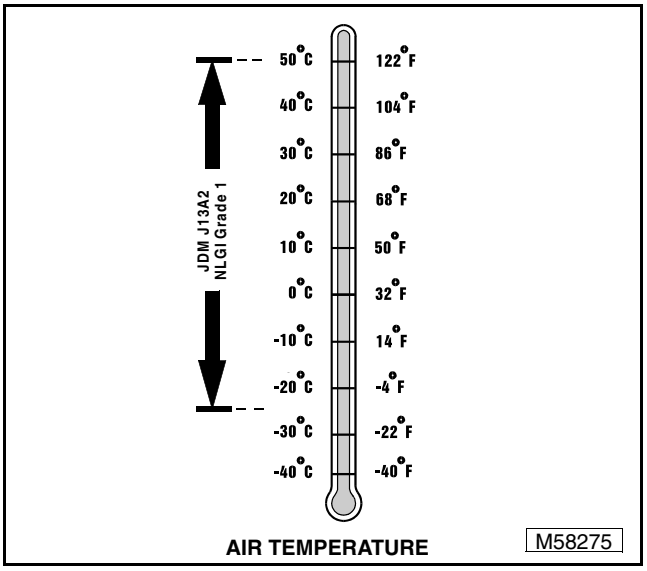
This anti-corrosion grease is formulated to provide the best protection against absorbing moisture, which is one of the major causes of corrosion. This grease is also superior in its resistance to separation and migration.

The following anti-corrosion grease is **PREFERRED**:

- **DuBois MPG-2® Multi-Purpose Polymer Grease—M79292.**

Other greases may be used if they meet or exceed the following specifications:

- John Deere Standard JDM J13A2, NLGI Grade 1.



GEAR CASE OIL

Use the following oil viscosity based on the air temperature range. Operating outside of the recommended oil air temperature range may cause premature gear case failure.

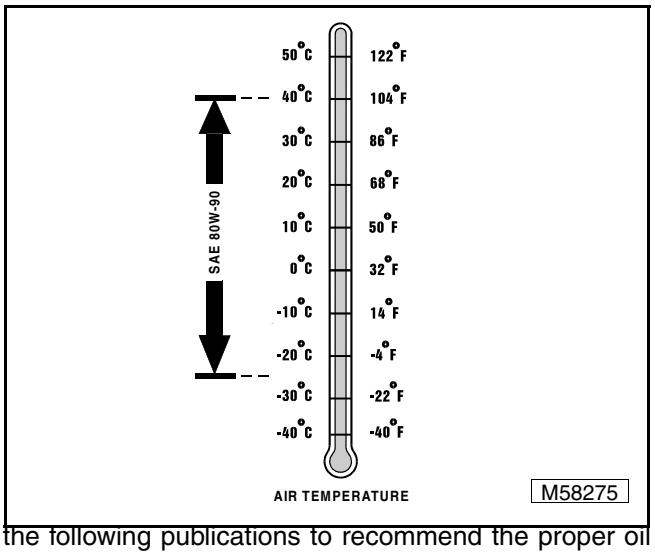
IMPORTANT: ONLY use a quality oil in this gear case. DO NOT mix any other oils in this gear case. DO NOT use BIO–HY–GARD® in this gear case.

The following John Deere gear case oil is **PREFERRED**:

- **GL-5 GEAR LUBRICANT®—SAE 80W-90.**
- **EXTREME–GARD™—SAE 80W-90.**

Other gear case oils may be used if above recommended John Deere gear case oil is not available, provided they meet the following specification:

- API Service Classification GL–5.



John Deere Dealers: You may want to cross-reference the following publications to recommend the proper oil for your customers:

- Module DX,GEOIL in JDS–G135;
- Section 530, Lubricants & Hydraulics, of the John Deere Merchandise Sales Guide;
- Lubrication Sales Manual PI7032.

ALTERNATIVE LUBRICANTS

Conditions in certain geographical areas outside the United States and Canada may require different lubricant recommendations than the ones printed in this technical manual or the operator's manual. Consult with your John Deere Dealer, or Sales Branch, to obtain the alternative lubricant recommendations.

IMPORTANT: Use of alternative lubricants could cause reduced life of the component.

If alternative lubricants are to be used, it is recommended that the factory fill be thoroughly removed before switching to any alternative lubricant.

SYNTHETIC LUBRICANTS

Synthetic lubricants may be used in John Deere equipment if they meet the applicable performance requirements (industry classification and/or military specification) as shown in this manual.

The recommended air temperature limits and service or lubricant change intervals should be maintained as shown in the operator's manual.

Avoid mixing different brands, grades, or types of oil. Oil manufacturers blend additives in their oils to meet certain specifications and performance requirements. Mixing different oils can interfere with the proper functioning of these additives and degrade lubricant performance.

LUBRICANT STORAGE

All machines operate at top efficiency only when clean lubricants are used. Use clean storage containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination. Store drums on their sides. Make sure all containers are properly marked as to their contents. Dispose of all old, used containers and their contents properly.

MIXING OF LUBRICANTS

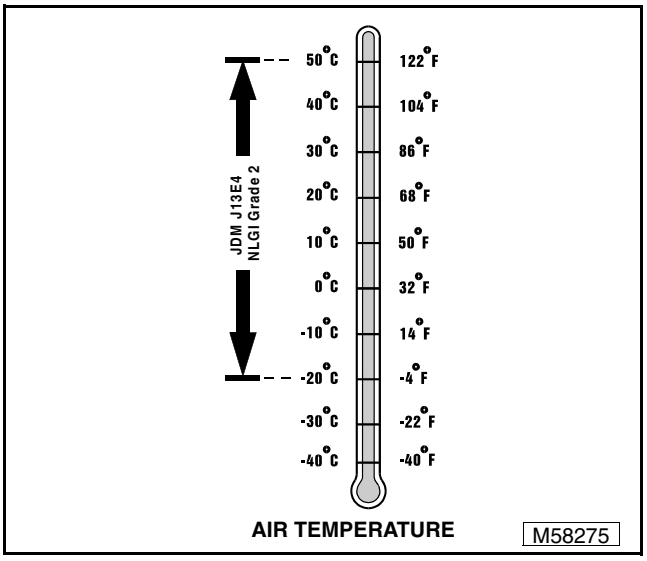
In general, avoid mixing different brands or types of lubricants. Manufacturers blend additives in their lubricants to meet certain specifications and performance requirements. Mixing different lubricants can interfere with the proper functioning of these additives and lubricant properties which will downgrade their intended specified performance.

GREASE

Use the following grease based on the air temperature range. Operating outside of the recommended grease air temperature range may cause premature failures.

The following should also be used in the auger.

IMPORTANT: ONLY use a quality grease in this application. DO NOT mix any other greases in this application. DO NOT use any BIO–GREASE in this application.



The following John Deere grease is **PREFERRED**:

- **NON-CLAY HIGH-TEMPERATURE EP GREASE®—JDM J13E4, NLGI Grade 2**
- **GREASE–GARD™—JDM J13E4, NLGI Grade 2**

Other greases may be used if above preferred John Deere grease is not available, provided they meet the following specification:

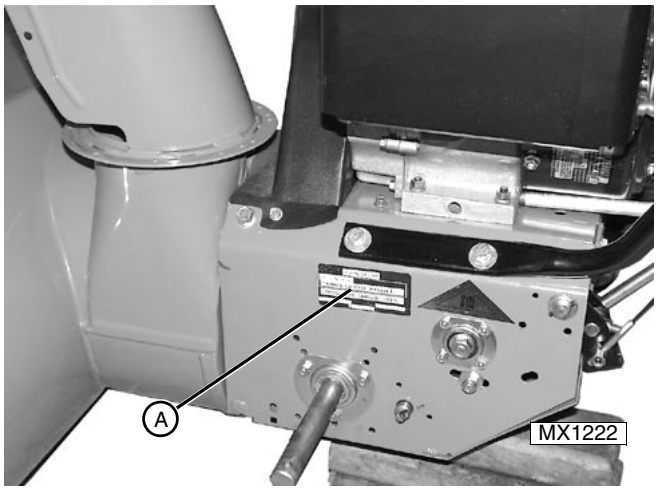
- John Deere Standard JDM J13E4, NLGI Grade 2

PRODUCT IDENTIFICATION LOCATIONS

When ordering parts or submitting a warranty claim, it is IMPORTANT that you include the product identification number (A) and the component product identification numbers (B).

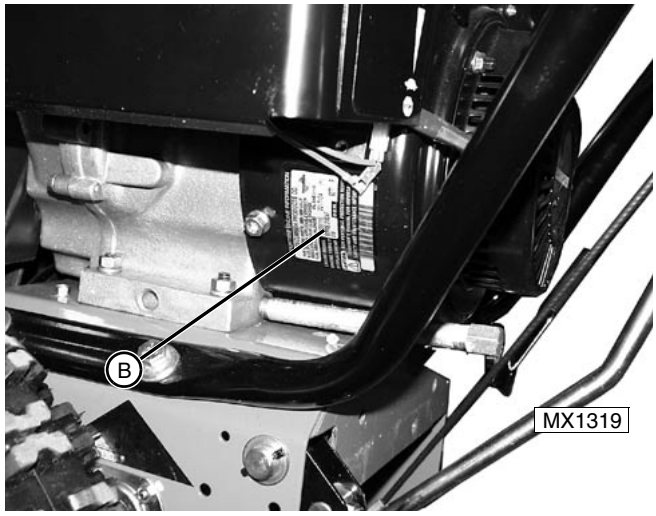
The location of identification numbers and component product identification numbers are shown.

PRODUCT IDENTIFICATION NUMBER



(1128DE Model shown; others similar)
(wheel removed for clarity)

ENGINE PIN NUMBER



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SPECIFICATIONS

	924DE	1128DE	1128DDE	1332DDE
ENGINE				
Manufacturer	Tecumseh -Snow King	Tecumseh -Snow King	Tecumseh -Snow King	Tecumseh -Snow King
Model	OHSK90	OHSK110	OHSK110	OHSK130
Type (cycle)	4 cycle	4 cycle	4 cycle	4 cycle
Horsepower	6.71 kW (9 hp)	8.20 kW (11 hp)	8.20 kW (11 hp)	9.69 kW (13 hp)
Slow Engine Idle speed	2000 ± 150 rpm	2000 ± 150 rpm	2000 ± 150 rpm	2000 ± 150 rpm
Fast Engine Idle speed	3600 ± 150 rpm	3600 ± 150 rpm	3600 ± 150 rpm	3600 ± 150 rpm
Displacement	318.46 cm^3 (19.43 cu. in.)	318.46 cm^3 (19.43 cu. in.)	318.46 cm^3 (19.43 cu. in.)	357.63 cm (21.82 cu. in.)^3
Bore - Std.	79.375 mm (3.125 in.)	79.375 mm (3.125 in.)	79.375 mm (3.125 in.)	84.125 mm (3.312 in.)
Bore - Max.	79.400 mm (3.126 in.)	79.400 mm (3.126 in.)	79.400 mm (3.126 in.)	84.150 mm (3.313 in.)
Stroke	70.993 mm (2.532 in.)	70.993 mm (2.532 in.)	70.993 mm (2.532 in.)	70.993 mm (2.532 in.)
Lubrication Type	Oil Dipper	Oil Dipper	Oil Dipper	Counterbalance Shaft
Oil capacity	0.77 L (26 U.S. oz)	0.77 L (26 U.S. oz)	0.77 L (26 U.S. oz)	0.95 L (32 U.S. oz)
Oil fill	Tube/dipstick in front of engine	Tube/dipstick in front of engine	Tube/dipstick in front of engine	Tube/dipstick in front of engine
Bearings: PTO/Flywheel	Aluminum alloy	Aluminum alloy	Aluminum alloy	Replaceable bronze bushing
Cylinder	Aluminum	Aluminum with cast iron sleeve	Aluminum with cast iron sleeve	Aluminum with cast iron sleeve
FUEL				
Type required	Unleaded gasoline - 87 octane or higher	Unleaded gasoline - 87 octane or higher	Unleaded gasoline - 87 octane or higher	Unleaded gasoline - 87 octane or higher
Fuel tank	3.8 L (1.0 U.S. gal)	3.8 L (1.0 U.S. gal)	3.8 L (1.0 U.S. gal)	3.8 L (1.0 U.S. gal)
Fuel filter	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)	Fine mesh in fuel tank Fine paper in-line between shut-off & carburetor (optional)

	924DE	1128DE	1128DDE	1332DDE
Carburetor	Float-type with manual choke and primer	Float-type with manual choke and primer	Float-type with manual choke and primer	Float-type with manual choke and primer

ELECTRICAL SPECIFICATIONS

Ignition	Electronic Capacitor Discharge Ignition (CDI) System	Electronic Capacitor Discharge Ignition (CDI) System	Electronic Capacitor Discharge Ignition (CDI) System	Electronic Capacitor Discharge Ignition (CDI) System
Ignition Module Air Gap	0.32 mm (0.013 in.)	0.32 mm (0.013 in.)	0.32 mm (0.013 in.)	0.32 mm (0.013 in.)
Spark plug	RN4C	RN4C	RN4C	RN4C
Spark plug Air Gap	0.762 mm (0.030 in.)	0.762 mm (0.030 in.)	0.762 mm (0.030 in.)	0.762 mm (0.030 in.)
Starting	Standard Recoil Pull Start with Automatic Compression Release (ACR)	Standard Recoil Pull Start with Automatic Compression Release (ACR)	Standard Recoil Pull Start with Automatic Compression Release (ACR)	Standard Recoil Pull Start with Automatic Compression Release (ACR)
Electric start	Standard; 120 V Electric Start Kit	Standard; 120 V Electric Start Kit	Standard; 120 V Electric Start Kit	Standard; 120 V Electric Start Kit
Alternator	18 Watt	18 Watt	3 and 5 Amp	3 and 5 Amp
Headlight	Standard	Standard	Standard	Standard

REPAIR SPECIFICATIONS

Carburetor Float	4.36 mm (11/64 in.)	4.36 mm (11/64 in.)	4.36 mm (11/64 in.)	4.36 mm (11/64 in.)
Camshaft Bearing Journal Dia. (Shaft)	15.82 - 15.84 mm (0.6230 - 0.6235 in.)	15.82 - 15.84 mm (0.6230 - 0.6235 in.)	15.82 - 15.84 mm (0.6230 - 0.6235 in.)	15.82 - 15.84 mm (0.6230 - 0.6235 in.)
Cam Bearing Inside Dia. (Cover/Block)	15.86 - 15.89 mm (0.6245 - 0.6255 in.)	15.86 - 15.89 mm (0.6245 - 0.6255 in.)	15.86 - 15.89 mm (0.6245 - 0.6255 in.)	15.86 - 15.89 mm (0.6245 - 0.6255 in.)
Crankshaft Dia. Flywheel End	34.912 - 34.925 mm (1.3745 - 1.3750 in.)	34.912 - 34.925 mm (1.3745 - 1.3750 in.)	34.912 - 34.925 mm (1.3745 - 1.3750 in.)	34.912 - 34.925 mm (1.3745 - 1.3750 in.)
Crankpin Journal Dia.	34.900 - 34.912 mm (1.3740 - 1.3745 in.)	34.900 - 34.912 mm (1.3740 - 1.3745 in.)	34.900 - 34.912 mm (1.3740 - 1.3745 in.)	34.900 - 34.912 mm (1.3740 - 1.3745 in.)
Crankshaft Dia. PTO End	34.912 - 34.925 mm (1.3745 - 1.3750 in.)	34.912 - 34.925 mm (1.3745 - 1.3750 in.)	34.912 - 34.925 mm (1.3745 - 1.3750 in.)	34.912 - 34.925 mm (1.3745 - 1.3750 in.)
Crankshaft End Play	0.05 - 1.06 mm (0.002 - 0.042 in.)	0.05 - 1.06 mm (0.002 - 0.042 in.)	0.05 - 1.06 mm (0.002 - 0.042 in.)	0.05 - 1.06 mm (0.002 - 0.042 in.)
Cover Bearing Inside Dia.	34.963 - 34.976 mm (1.3765 - 1.3770 in.)	34.963 - 34.976 mm (1.3765 - 1.3770 in.)	34.963 - 34.976 mm (1.3765 - 1.3770 in.)	34.963 - 34.976 mm (1.3765 - 1.3770 in.)

	924DE	1128DE	1128DDE	1332DDE
Block Bearing Inside Dia.	34.963 - 34.976 mm (1.3765 - 1.3770 in.)	34.963 - 34.976 mm (1.3765 - 1.3770 in.)	34.963 - 34.976 mm (1.3765 - 1.3770 in.)	34.963 - 34.976 mm (1.3765 - 1.3770 in.)
Connecting Rod Crank Bearing Bore ID	34.988 - 35.001 mm (1.3775 - 1.3780 in.)	34.988 - 35.001 mm (1.3775 - 1.3780 in.)	34.988 - 35.001 mm (1.3775 - 1.3780 in.)	34.988 - 35.001 mm (1.3775 - 1.3780 in.)
Cylinder Bore ID	79.375 - 79.400 mm (1.3775 - 1.3780 in.)	79.375 - 79.400 mm (1.3775 - 1.3780 in.)	79.375 - 79.400 mm (1.3775 - 1.3780 in.)	84.125 - 84.150 mm (3.312 - 3.313 in.)
Piston Diameter (Bottom Skirt)	79.235 - 79.261 mm (3.1195 - 3.1205 in.)	79.235 - 79.261 mm (3.1195 - 3.1205 in.)	79.235 - 79.261 mm (3.1195 - 3.1205 in.)	84.061 - 84.087 mm (3.3095 - 3.3105 in.)
	(as measured from 6.35 mm (0.25 in.) from bottom of skirt and 180° from center of piston pin hole)			
Piston-To-Cylinder Bore Clearance	0.038 - 0.089 mm (0.0015 - 0.0035 in.)	0.038 - 0.089 mm (0.0015 - 0.0035 in.)	0.038 - 0.089 mm (0.0015 - 0.0035 in.)	0.038 - 0.089 mm (0.0015 - 0.0035 in.)
Piston Ring Side Clearance: TOP/BOT Comp.	0.051 - 0.127 mm (0.002 - 0.004 in.)	0.051 - 0.127 mm (0.002 - 0.004 in.)	0.051 - 0.127 mm (0.002 - 0.004 in.)	0.051 - 0.127 mm (0.002 - 0.004 in.)
Piston Ring Side Clearance: Oil Control	0.025 - 0.076 mm (0.001 - 0.003 in.)	0.025 - 0.076 mm (0.001 - 0.003 in.)	0.025 - 0.076 mm (0.001 - 0.003 in.)	0.025 - 0.076 mm (0.001 - 0.003 in.)
Piston Ring End Gap	0.254 - 0.508 mm (0.010 - 0.020 in.)	0.254 - 0.508 mm (0.010 - 0.020 in.)	0.254 - 0.508 mm (0.010 - 0.020 in.)	0.254 - 0.508 mm (0.010 - 0.020 in.)
Valve-To-Rocker Arm Clearance	0.1016 mm (0.004 in.)	0.1016 mm (0.004 in.)	0.1016 mm (0.004 in.)	0.1016 mm (0.004 in.)
Valve Seat Width	0.89 - 1.14 mm (0.035 - 0.046 in.)	0.89 - 1.14 mm (0.035 - 0.046 in.)	0.89 - 1.14 mm (0.035 - 0.046 in.)	0.89 - 1.14 mm (0.035 - 0.046 in.)
Valve Guide Oversize Diameter	8.717 - 8.743 mm (0.343 - 0.344 in.)	8.717 - 8.743 mm (0.343 - 0.344 in.)	8.717 - 8.743 mm (0.343 - 0.344 in.)	8.717 - 8.743 mm (0.343 - 0.344 in.)
Piston Bore Cross. Pattern	45 degrees	45 degrees	45 degrees	45 degrees
Cylinder Head Dist. (Max.)	0.127 mm (0.005 in.)	0.127 mm (0.005 in.)	0.127 mm (0.005 in.)	0.127 mm (0.005 in.)
Governor Shaft Exp. Length	33.27 mm (1.31 in.)	33.27 mm (1.31 in.)	33.27 mm (1.31 in.)	33.27 mm (1.31 in.)

TORQUE SPECIFICATIONS

Rocker Cover Studs	6 N•m (55 lb-in.)	6 N•m (55 lb-in.)	6 N•m (55 lb-in.)	6 N•m (55 lb-in.)
Rocker Arm Lock Nut	13.5 N•m (120 lb-in.)	13.5 N•m (120 lb-in.)	13.5 N•m (120 lb-in.)	13.5 N•m (120 lb-in.)
Cylinder Head Cap Screw	26 N•m (230 lb-in.)	26 N•m (230 lb-in.)	26 N•m (230 lb-in.)	26 N•m (230 lb-in.)
Flywheel Nut	79 N•m (58 lb-ft)	79 N•m (58 lb-ft)	79 N•m (58 lb-ft)	79 N•m (58 lb-ft)

	924DE	1128DE	1128DDE	1332DDE
Intake Manifold Cap Screw	13 N•m (115 lb-in.)	13 N•m (115 lb-in.)	13 N•m (115 lb-in.)	13 N•m (115 lb-in.)
Muffler Cap Screw	22.5 N•m (200 lb-in.)	22.5 N•m (200 lb-in.)	22.5 N•m (200 lb-in.)	22.5 N•m (200 lb-in.)
Exhaust Manifold	18 N•m (160 lb-in.)	18 N•m (160 lb-in.)	18 N•m (160 lb-in.)	18 N•m (160 lb-in.)
Carburetor Mtg. Cap Screw	8 N•m (70 lb-in.)	8 N•m (70 lb-in.)	8 N•m (70 lb-in.)	8 N•m (70 lb-in.)
Connecting Rod Cap Screw	24 N•m (210 lb-in.)	24 N•m (210 lb-in.)	24 N•m (210 lb-in.)	24 N•m (210 lb-in.)
Crankcase Cover Cap Screw*	14 N•m (125 lb-in.)	14 N•m (125 lb-in.)	14 N•m (125 lb-in.)	14 N•m (125 lb-in.)
Spark Plug	28.5 N•m (250 lb-in.)	28.5 N•m (250 lb-in.)	28.5 N•m (250 lb-in.)	28.5 N•m (250 lb-in.)
Ignition Module	5 N•m (44 lb-in.)	5 N•m (44 lb-in.)	5 N•m (44 lb-in.)	5 N•m (44 lb-in.)
Electric Starter	11 N•m (100 lb-in.)	11 N•m (100 lb-in.)	11 N•m (100 lb-in.)	11 N•m (100 lb-in.)
Alternator Coil	10 N•m (90 lb-in.)	10 N•m (90 lb-in.)	10 N•m (90 lb-in.)	10 N•m (90 lb-in.)
Magneto Stator	7.5 N•m (66 lb-in.)	7.5 N•m (66 lb-in.)	7.5 N•m (66 lb-in.)	7.5 N•m (66 lb-in.)
Recoil Starter	5.5 - 9 N•m (50 - 80 lb-in.)	5.5 - 9 N•m (50 - 80 lb-in.)	5.5 - 9 N•m (50 - 80 lb-in.)	5.5 - 9 N•m (50 - 80 lb-in.)

*Apply LOCTITE® #242 (John Deere #T43512 - Medium Strength) to first few threads of cap screw.

OTHER MATERIALS

Number & Name	Use
John Deere NEVER-SEEZ® Lubricant PT569	Apply to crankshaft end.
LOCTITE® PRODUCTS:	
(U.S. / Canadian) John Deere No. (Loctite No.)	
T43512 (#242) (Medium Strength)	Apply to governor shaft.
	Apply to crankcase cover cap screws.

® LOCTITE is a registered trademark of the Loctite Corp.

SPECIAL TOOLS

Number & Name	Use
JDG488 Seal Installer	Install flywheel end crankshaft oil seal.
JDG489 Seal Installer	Install PTO end crankshaft oil seal.
JDM52A Valve Seat Service Set	Resurface valve seats.
D05058ST Valve Inspection Center	Inspect intake and exhaust valves.
JDM15 Dial Indicator Kit	Measures valve head diameter
D05351ST Spark Tester	Test state of ignition system.
D17001BR Flex Hone	Final honing of cylinder on 924DE.
D17002BR Flex Hone	Final honing of cylinder on 1128DE, 1128DDE, and 1332DDE.
JDG332 Telescoping Gauge Set	Measurements for wear tolerances.
JDG1322 Piston Ring Compressor	Compression of piston rings during piston installation.
JDG438 Ring Groove Cleaner	Cleaning of ring grooves on piston.
JDM54 or JDM55 Valve Lapper	Lapping valve and valve seat mating surfaces.
JDM62 Glaze Breaker	Removing glaze ring from cylinder.
JDM63 Rigid Cylinder Hone Set	Initial honing of cylinder.
JDM70 Valve Spring Compressor	Remove valve springs.
JDM74A-5 Spark Plug Ground Tool	Grounds and protects ignition system.
JT02153 Current Clamp-On Probe	Test related electrical system components.
JT03503 Vacuum Gauge Test Kit	Measure crankcase vacuum.
JT05697 U-Tube Manometer Vacuum Test Kit	Measure crankcase vacuum.
JT05791 Analog/Digital Multimeter	Test related electrical system components.
JT07270 Digital Pulse Tachometer	Test engine speed.
JT07363 Dial Indicator Kit	Measure crankshaft end play.
Wire Feeler Gauge	Set spark plug air gap.
Flat Feeler Gauge	Set valve-to-tappet clearance.
Outside Micrometer	Measurements for wear tolerances.
Inside/Outside Dial Calipers	Measurements for wear tolerances.
Piston Ring Expander Tool	Expansion of piston rings for removal/installation

TROUBLESHOOTING

ENGINE TROUBLESHOOTING CHARTS

Problem or Symptom / Check or Solution	Engine will not crank	Engine cranks but will not start or starts hard	Engine has low power or runs very poorly	Engine fuel/air supply inadequate	Engine has no spark	Engine misfires	Engine surges or over-speeds	Engine floods	Engine has blue exhaust smoke	Engine has black exhaust smoke	Engine uses too much oil	Engine backfires thru carburetor	Engine backfires thru muffler	Engine spark plug fouled	Engine exhibits loud noise
FUEL/AIR SYSTEM: Plugged tank filter or vent		●		●											
Fuel shut-off valve not fully opened or tank empty		●	●	●											
Primer over-used or faulty		●		●				●		●				●	
Plugged or restricted line		●	●	●											
Loose or damaged line		●	●	●											
Carb. fuel inlet plugged		●		●											
Carb. bowl o-ring seal leaky		●	●	●											
Carb. air intake restricted		●	●	●											
Carb. atmospheric vent restricted		●	●	●											
Carb. air bleed restricted		●	●	●											
Carb. idle port restricted		●	●	●											
Carb. float height incorrect		●	●	●			●	●		●		●	●	●	
Carb. main nozzle restricted		●	●	●											
Carb. inlet needle and seat dirty or stuck		●	●	●				●		●		●	●	●	
Fuel stale, contains water, or wrong type		●	●	●		●									

Problem or Symptom / Check or Solution	Engine will not crank	Engine cranks but will not start or starts hard	Engine has low power or runs very poorly	Engine fuel/air supply inadequate	Engine has no spark	Engine misfires	Engine surges or over-speeds	Engine floods	Engine has blue exhaust smoke	Engine has black exhaust smoke	Engine uses too much oil	Engine backfires thru carburetor	Engine backfires thru muffler	Engine spark plug fouled	Engine exhibits loud noise
Governor and linkage set improperly		●	●	●			●								
Choke or throttle plates/linkage worn or misadjusted		●	●	●			●			●		●	●	●	
Carburetor too rich		●	●			●		●		●		●	●	●	
Carburetor too lean		●	●	●		●									
Carburetor loose on mounting		●	●	●		●	●								●
Carb. contaminated with debris or varnish		●	●	●											
ELECTRICAL SYSTEM: Spark plug fouled, defective, gap not correct or incorrect spark plug		●	●	●	●	●		●		●		●	●	●	
Defective ignition components		●	●	●	●	●		●		●			●	●	
Starting motor worn or defective, cranking rpm too slow, cables corroded/broke, or switch faulty	●	●			●			●							
ENGINE: Engine overloaded or throttle not at FAST position	●	●	●	●											●
Carburetor, intake manifold, or cylinder head gaskets leaking or damaged		●	●			●					●				●
Low compression from worn piston, rings, cylinder, valves or warped head		●	●						●		●				●

Problem or Symptom / Check or Solution	Engine will not crank	Engine cranks but will not start or starts hard	Engine has low power or runs very poorly	Engine fuel/air supply inadequate	Engine has no spark	Engine misfires	Engine surges or over-speeds	Engine floods	Engine has blue exhaust smoke	Engine has black exhaust smoke	Engine uses too much oil	Engine backfires thru carburetor	Engine backfires thru muffler	Engine spark plug fouled	Engine exhibits loud noise
Valve clearance incorrect, burned or warped valves and seats, or defective springs		●	●			●		●			●	●	●	●	●
Engine oil viscosity or level incorrect	●	●	●						●		●				●
Engine main seals leaking		●	●						●		●				●
Crankcase breather restricted, clearance incorrect, or drain hole plugged		●	●						●		●		●	●	
Valve guides or seals worn or leaking, or valve stems worn.		●	●			●					●		●		●
Worn, stuck, or broken piston rings, cylinder bore worn, compression and vacuum low	●	●	●			●			●		●				●
Connecting rod or crankshaft bearings worn, internal wear limits out of specification	●	●	●			●					●				●
Engine mounting hardware loose, broken, or missing			●												●
<u>RECOIL START SYSTEM:</u> Recoil spring weak, broke or dislodged	●														●
Rope dislodged from spool or tangled	●														
Dogs or dog springs worn, weak, broke, or dislodged	●														●
Brake spring worn, weak, or broke	●														●

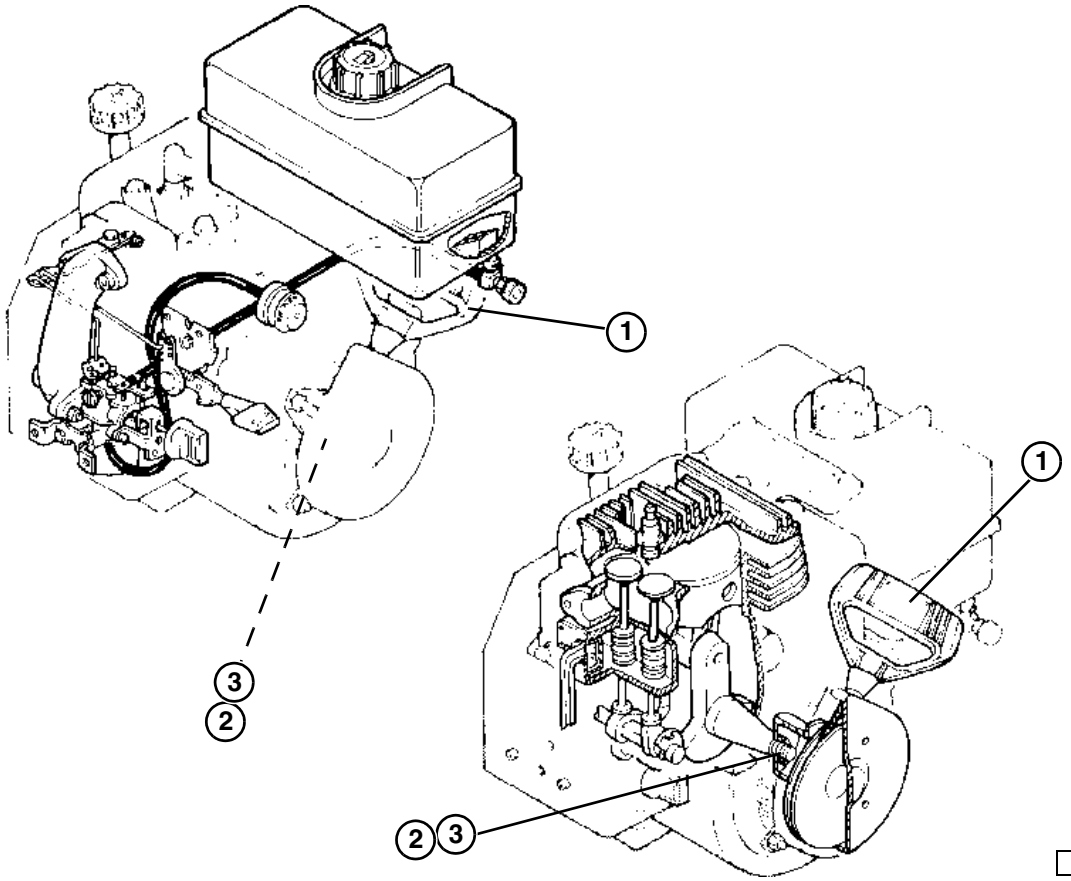
DIAGNOSTICS

ENGINE WILL NOT CRANK (RECOIL STARTER)

Test Conditions:

- Machine on level surface, key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Gently pull on starter handle and watch engine output shafts.	Engine output shafts turn over.	Remove recoil starter assembly and check recoil starter for malfunction.
2. Remove recoil starter and install socket and breaker bar on flywheel nut or cap screw and turn clockwise.	Flywheel and output shafts turn over.	Remove flywheel and check key and keyway for damage.
3. With flywheel removed, install flywheel nut or cap screw on or in end of crankshaft and turn clockwise with socket and breaker bar.	Output shafts turn over.	Tear engine down and check for malfunction.

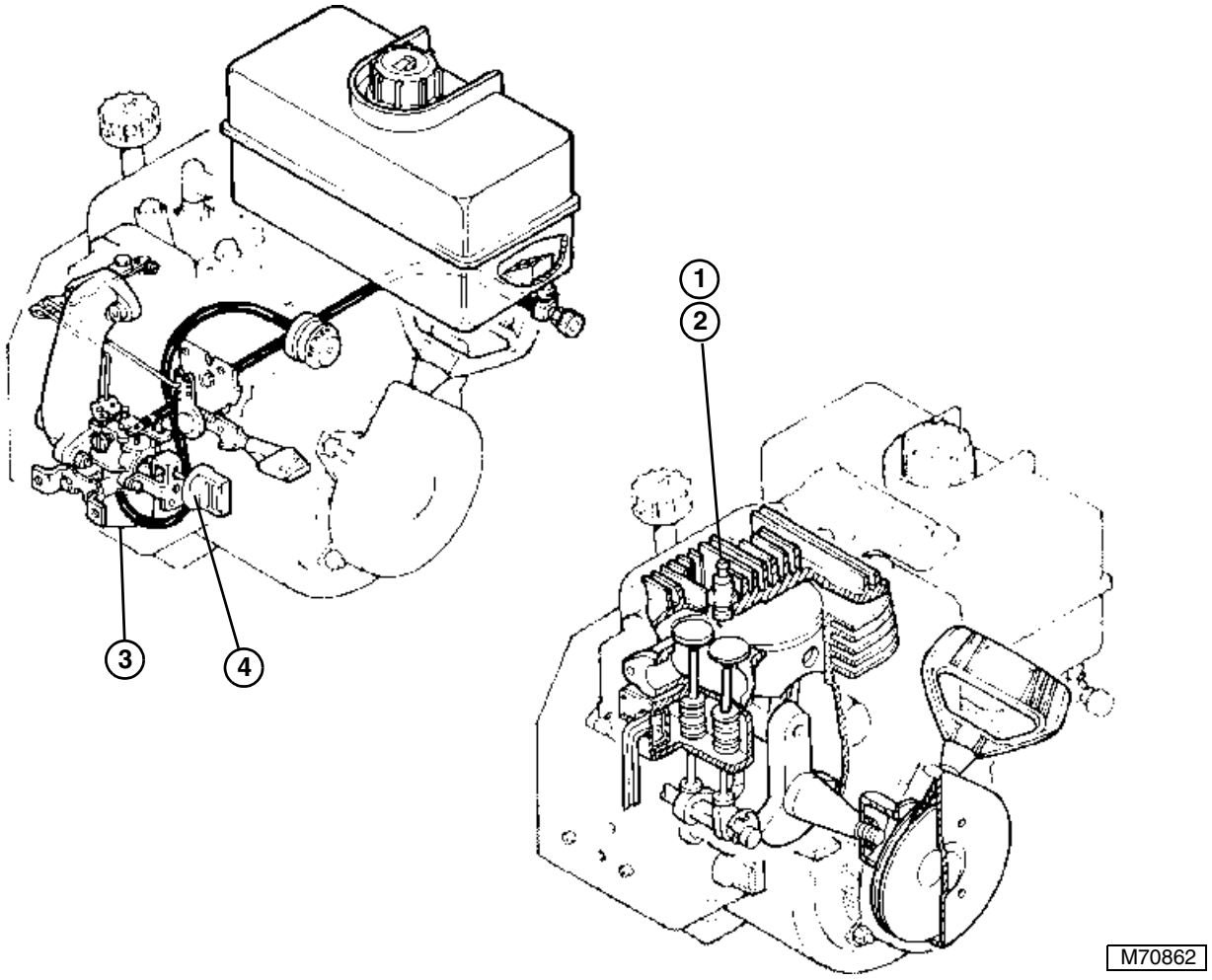


ENGINE TURNS OVER BUT WILL NOT START

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Spark plug (check for fuel and correct gap)	Plug dry and gap set at **0.76 mm (0.030 in.)**	Check carburetor float for engine flooding, clean plug, and set gap.
2. Spark plug (test spark)	Good hot spark	Check ignition circuit. Replace spark plug.
3. Carburetor bowl nut (check for fuel in float bowl. Inspect and clean nut orifice)	Fuel present, bowl clean	Check for lack of fuel in carburetor.
4. Carburetor (check choke adjustment)	Choke plate fully closed with choke control at “Full”	Adjust choke components.

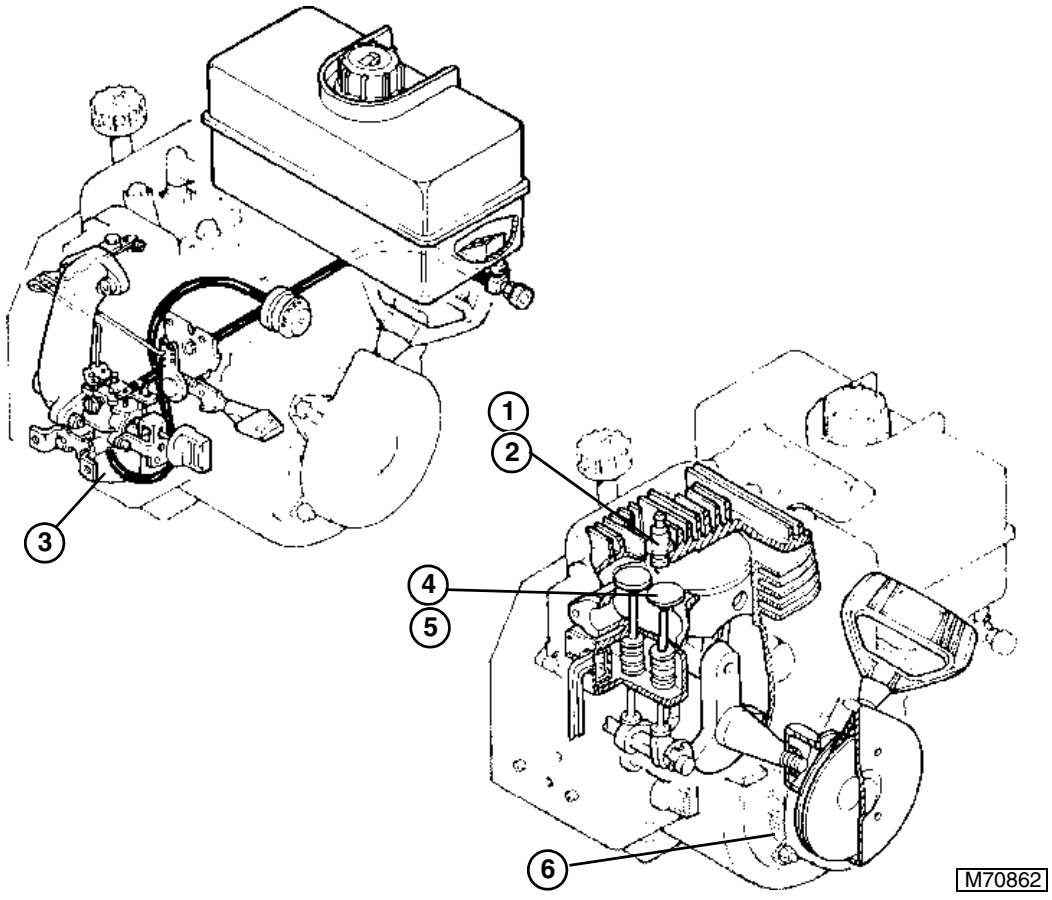


ENGINE STOPS WHEN HOT

Test Conditions:

- Key switch “OFF”
- Auger drive disengaged
- Transmission control in “NEUTRAL”
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Spark plug (check for fuel and correct gap)	Plug dry and gap set at **0.76 mm (0.030 in.)**	Check carburetor float for engine flooding, clean plug, and set gap.
2. Spark plug (test spark)	Good hot spark	Check ignition circuit. Replace spark plug.
3. Carburetor drain (check for fuel in float bowl)	Fuel present	Check carburetor for lack of fuel.
4. Valves (check clearance)	Intake and exhaust valve clearance is **0.10 mm (0.004 in.)**	Adjust valves.
5. Valves (check ACR and valves)	Valves operating	Inspect valve train components.
6. Flywheel (inspect key)	Not sheared	Replace key.

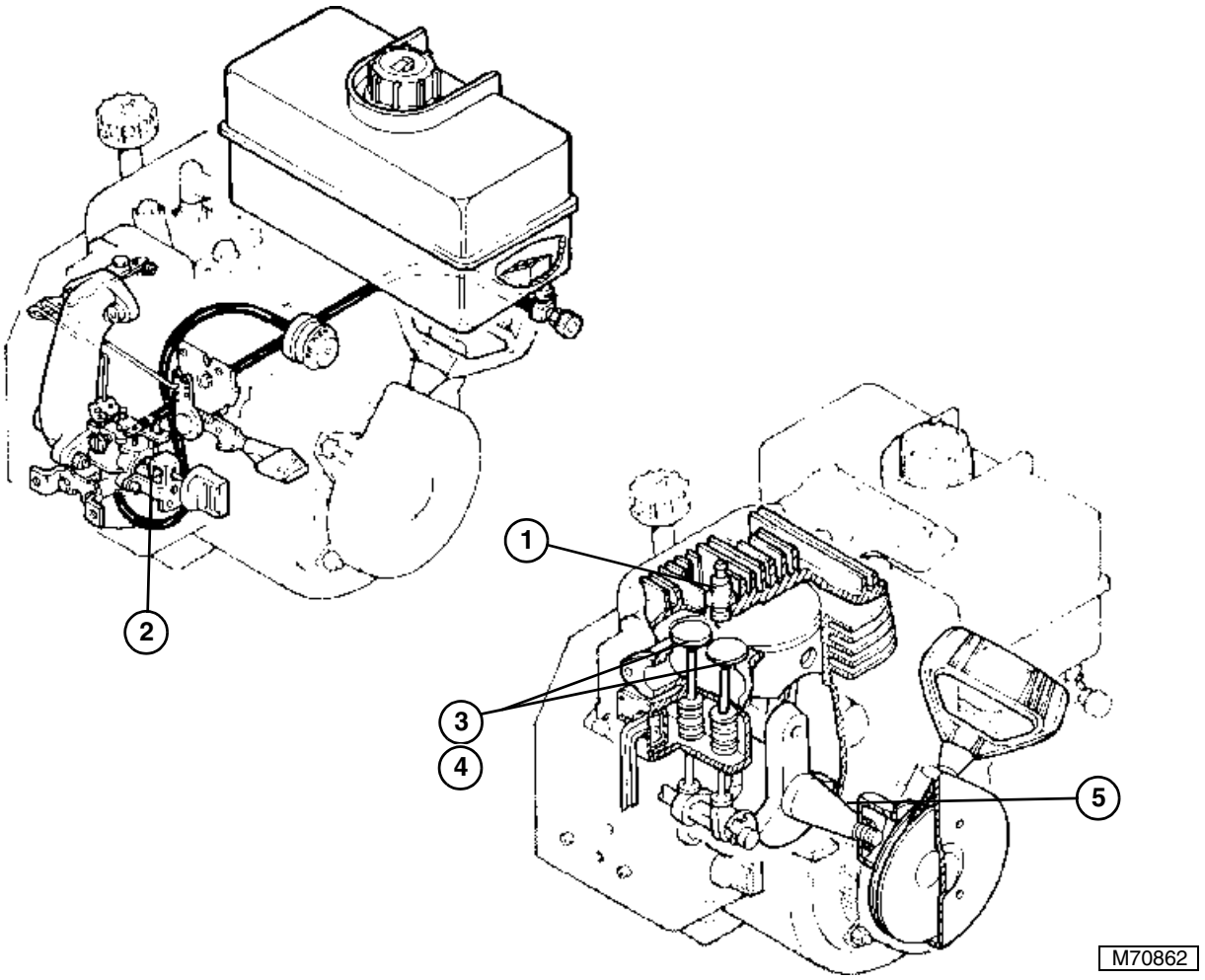


ENGINE BACKFIRES THROUGH CARBURETOR

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Spark plug (replace)	No improvement in performance	Spark plug was fouled.
2. Carburetor (check choke adjustment)	Fully open when set at “Off”	Adjust choke.
3. Valves (check clearance)	Intake and exhaust valve clearance is **0.10 mm (0.004 in.)**	Adjust valves.
4. Valves (check valve lift)	Both open same amount	Replace camshaft.
5. Flywheel (inspect key)	Not sheared	Replace key.

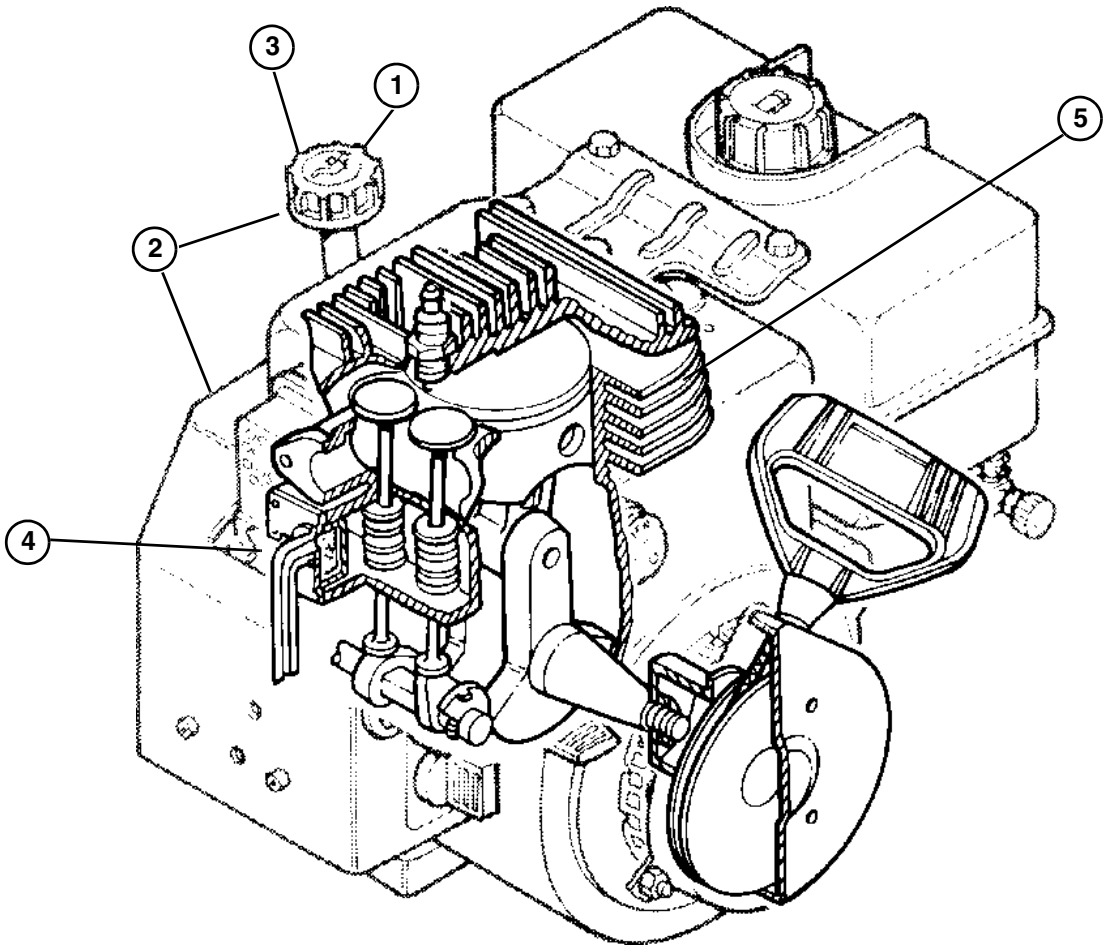


BLUE EXHAUST SMOKE OR OIL IN CARBURETOR HOUSING

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Dipstick (check oil level)	Below “Full” mark on dipstick	Drain oil.
2. Dipstick (inspect seals)	Not cracked	Replace.
3. Crankcase (test vacuum)	**25 mm (1.0 in.)** Water at fast idle	Perform necessary engine repairs.
4. Crankcase breather (inspect oil drain back hole)	Not plugged	Clean hole.
5. Cooling fins (inspect for debris)	Not plugged	Remove debris.



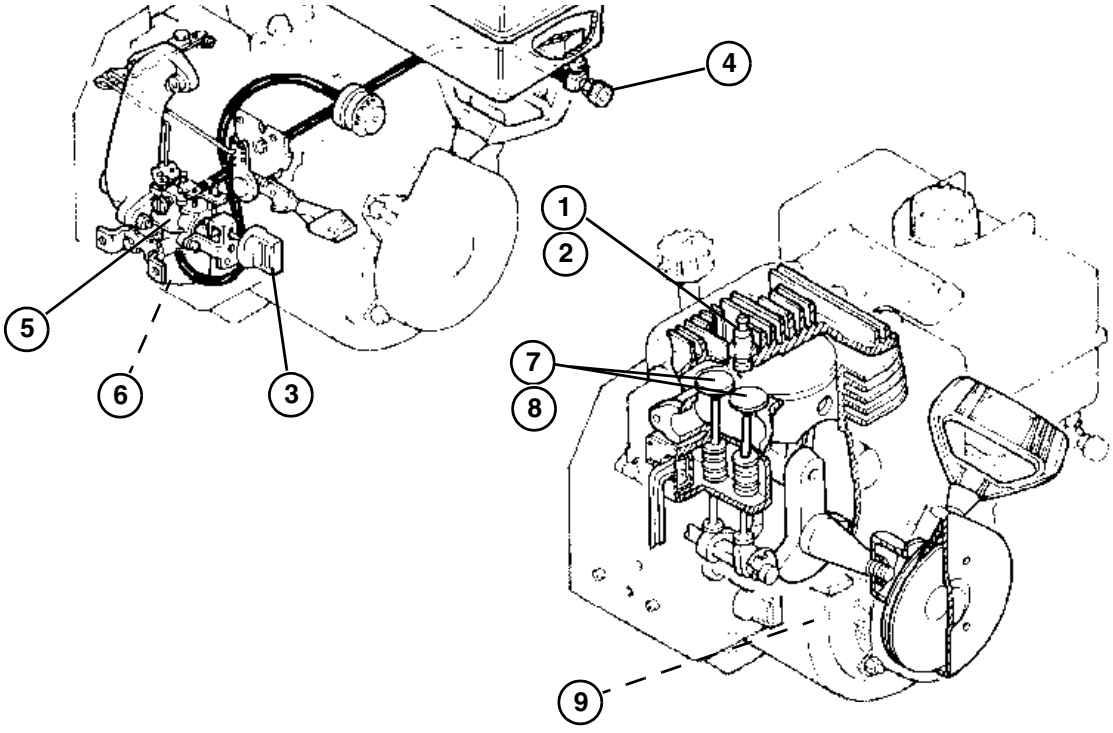
M70853

ENGINE MISS FIRES

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Spark plug (replace)	No change in engine performance.	Plug was fouled.
2. Spark plug (check for fuel)	Plug dry	Follow engine flooding test.
3. Carburetor (check choke adjustment)	Choke plate fully open with choke control at “Off”	Adjust choke.
4. Fuel supply (use external supply of known good fuel)	No change in engine performance	Drain system and add fresh fuel.
5. Carburetor (check high speed adjust)	Smooth idle at high rpm	Adjust high speed idle.
6. Carburetor (check float bowl drain assembly)	Fuel inlet and idle outlet holes open and clean	Clean assembly.
7. Valves (check clearance)	Intake and exhaust valve clearance is **0.10 mm (0.004 in.)**	Adjust valves.
8. Valves (check valve lift)	Both open same amount	Replace camshaft.
9. Flywheel (inspect key)	Not sheared	Replace key.

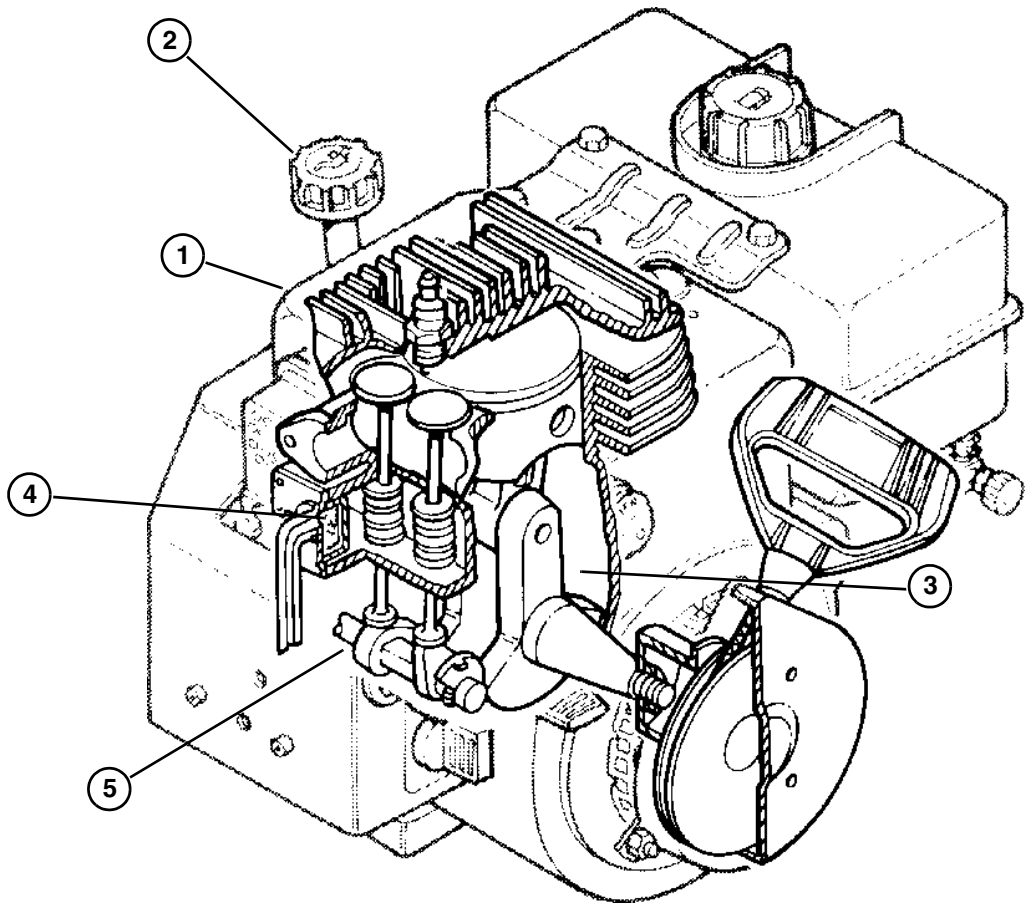


ENGINE USES TOO MUCH OIL

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Engine (inspect for leakage)	No leakage	Repair leakage.
2. Dipstick (check seal)	Not cracked	Replace seal.
3. Crankcase (test vacuum)	**25 mm (1.0 in.)** Water at fast idle	Perform necessary engine repairs.
4. Crankcase breather (inspect oil drain back hole)	Not plugged	Clean hole.
5. Internal engine (inspect for internal component wear)	None over specifications	Perform necessary engine repairs.

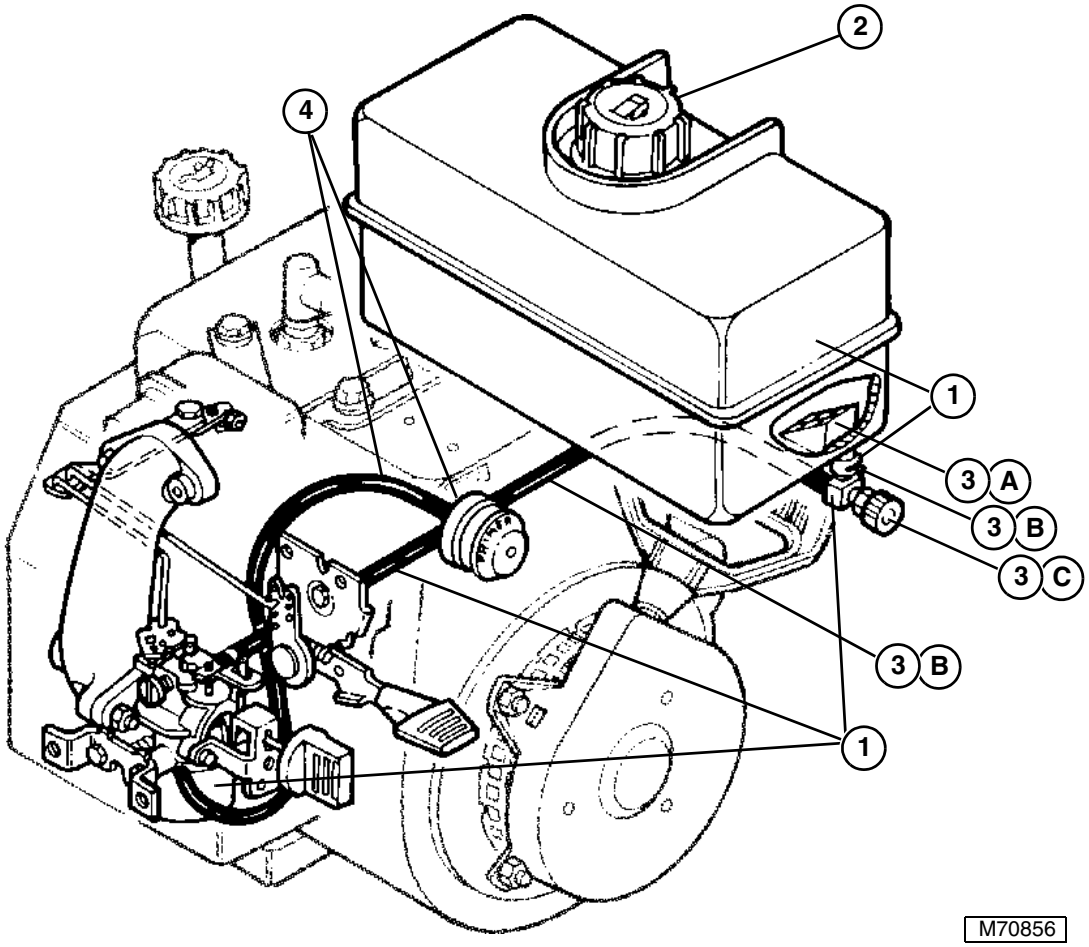


LACK OF FUEL IN CARBURETOR

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged
- Fuel in tank

Test/Check Point	Normal	If Not Normal
1. Check fuel supply system for leaks	No leaks – fully operational.	Repair leaks and/or replace components.
2. Inspect fuel tank vent cap	No restriction – fully operational.	Clean or replace cap.
3. Fuel supply components	No restrictions – fully operational.	A–Inspect, clear, or replace tank screen. B–Inspect, clear, or replace fuel lines. C–Inspect, clear, or replace shut-off valve.
4. Primer and tube	No restrictions – fully operational.	Clear or replace primer and/or tube.

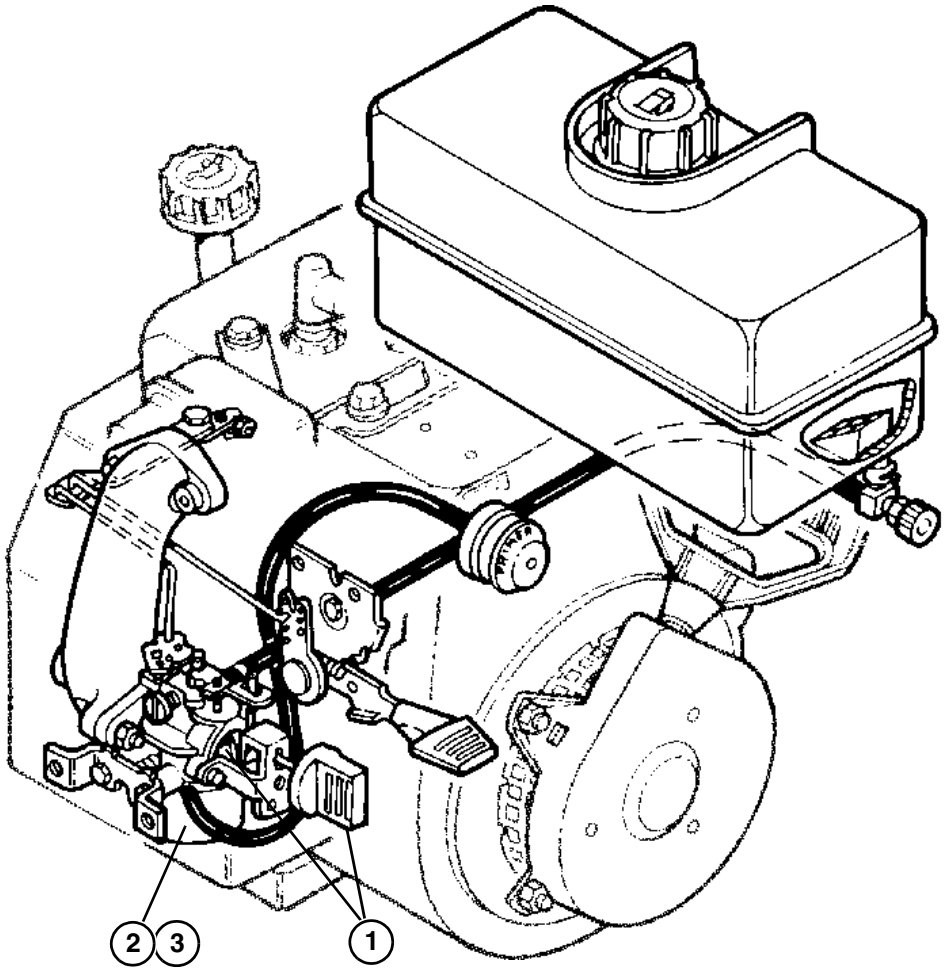


ENGINE FLOODED

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Carburetor – check choke lever operation	Fully open with control knob in “Off” position.	Adjust or replace linkage and/or replace carburetor.
2. Carburetor – inspect float	No fuel inside float – fully operational.	Adjust or replace float components.
3. Carburetor – inspect inlet needle and seat	Not worn – fully operational.	Adjust or replace needle and seat.



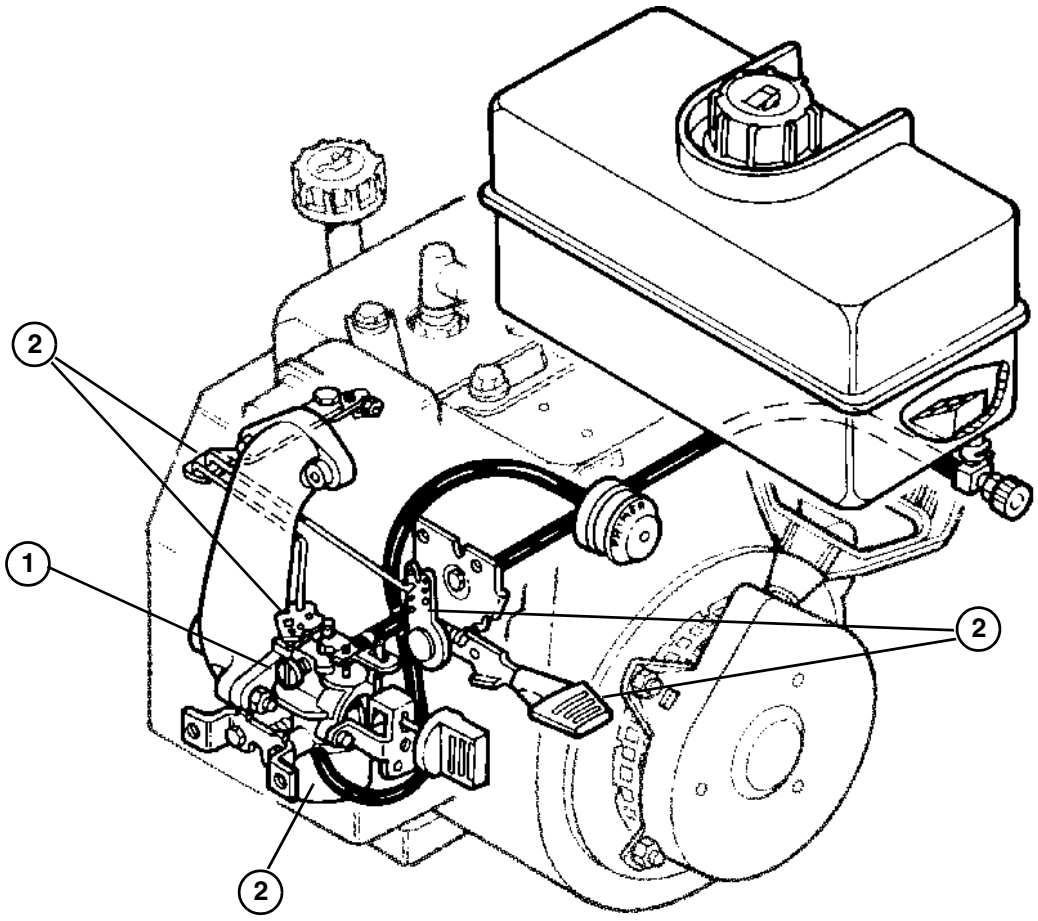
BACKFIRES THROUGH MUFFLER WHEN SHUT-OFF

NOTE: Allow engine to idle for 15 seconds before shutting off.

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Carburetor – check SLOW idle stop speed adjustment.	Set at specification **(2000 ± 150 rpm).**	Adjust SLOW idle stop speed.
2. Carburetor/Throttle Linkage – check float/needle valve and throttle linkage operation.	Fuel flow slows appropriately when throttle and float/needle valve are closed.	Adjust or replace throttle linkage and/or float/needle valve components.



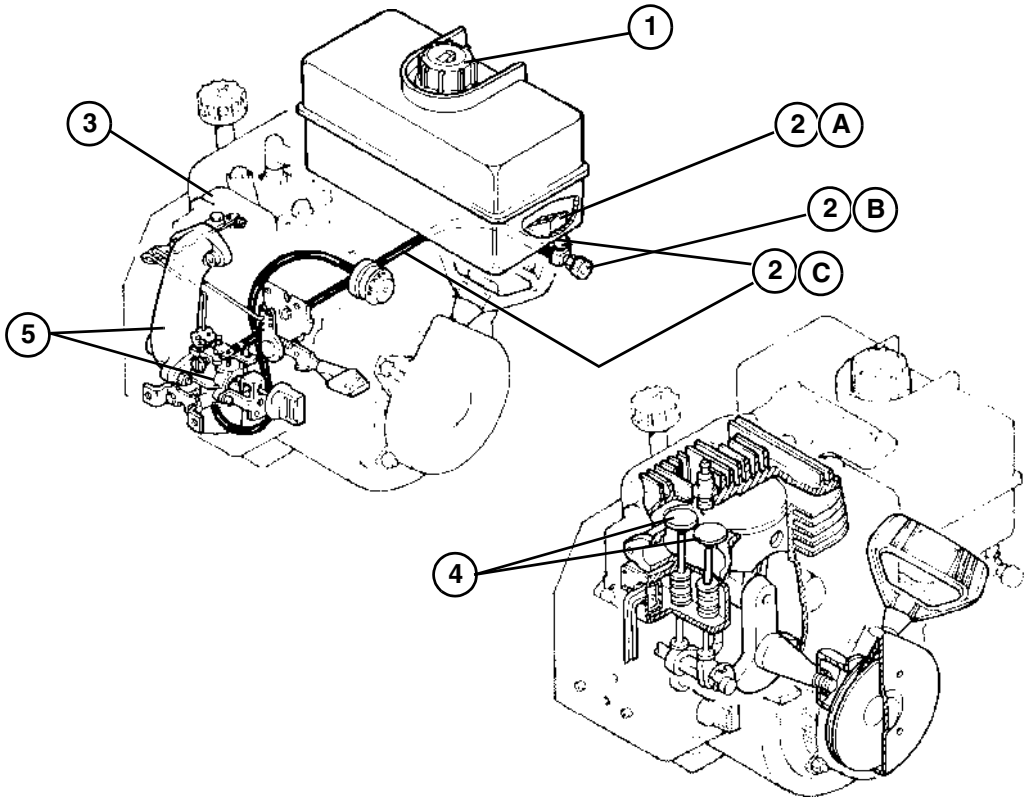
M70853

LOSES POWER OR RUNS ROUGH WHEN HOT

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Fuel tank – remove cap while engine is running	No change in engine performance – no restrictions.	Clean or replace fuel tank cap/vent.
2. Fuel supply – remove and check for fuel	Open flow of fuel – no restrictions.	A – Inspect and clean fuel tank screen. B – Inspect shut-off. C – Inspect fuel lines.
3. Muffler – check for restrictions	No restrictions.	Replace muffler.
4. Valves – check clearances	Intake and exhaust valve clearances within specification.	Adjust valves or replace all necessary valve train components.
5. Carburetor – inspect internal passages	No varnish, restrictions, or debris.	Clean passages.



M70862

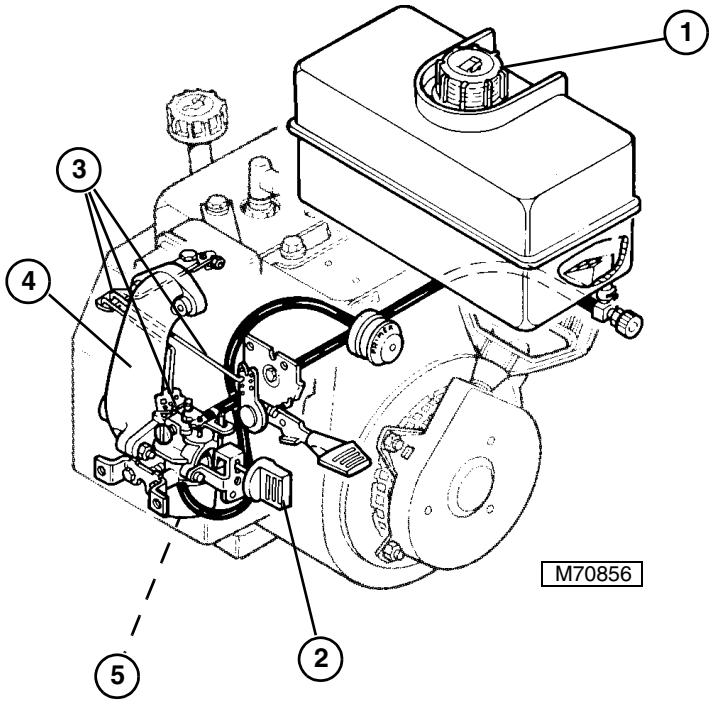
ENGINE SURGES

NOTE: Surging is the result of a lean mixture (not enough fuel or too much air)

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Fuel tank – remove cap while engine is running	No change in engine performance.	Clean or repair fuel tank cap vent.
2. Carburetor – check choke linkage	Fully open with control at “Off” position.	Adjust or replace choke linkage.
3. Governor – inspect linkage and adjustment	Linkage free and adjusted properly.	Adjust governor or replace components.
4. Intake manifold – spray aerosol lubricant around intake gaskets while engine is running	No change in engine performance.	Replace gaskets.
5. Carburetor float bowl nut – check for plugging	Upper and lower holes open and clean.	Clean or replace nut.

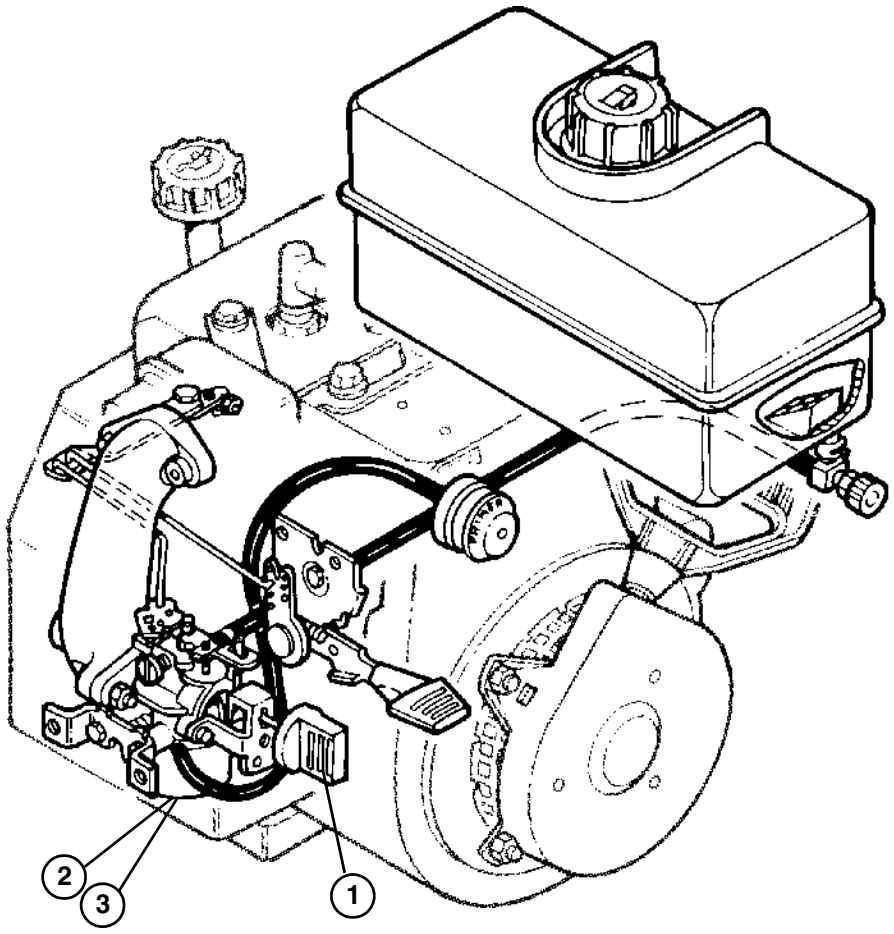


BLACK EXHAUST SMOKE

Test Conditions:

- Key switch “OFF”
- Transmission control in “NEUTRAL”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Carburetor – check choke adjustment	Fully open with knob in “OFF” position.	Adjust choke linkage or replace components.
2. Carburetor float bowl – inspect needle and seat	Not worn and functioning properly.	Replace needle and seat.
3. Carburetor – inspect float	No holes in float and adjusted properly.	Adjust or replace float.



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TESTS AND ADJUSTMENTS

SPARK PLUG AIR GAP ADJUSTMENT

Reason:

To check if proper spark plug gap exists for optimum engine performance.

Equipment:

- Wire Feeler Gauge

Procedure:

1. Allow engine to cool sufficiently before beginning.
2. Remove, inspect, and clean spark plug.
3. Use a wire feeler gauge to set air gap.

Specification:

Air Gap . . . . . 0.76 mm (0.030 in.)

4. Install spark plug. Tighten to **28.5 N•m (250 lb-in.)**.

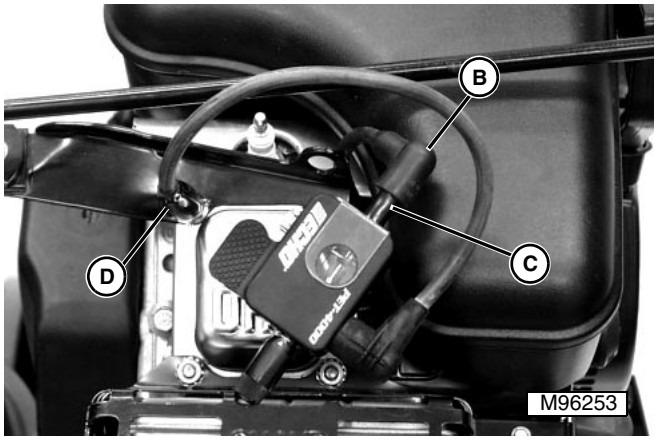
IGNITION MODULE SPARK TEST

Reason:

To determine causes of spark failure or verify good spark.

Equipment:

- D05351ST Spark Tester



IMPORTANT: DO NOT adjust spark tester air gap beyond nominal setting (A) – 6.0 mm (0.2 in.). Damage to ignition components and tester may occur.

Procedure:

1. Set tester air gap to nominal position (A).
2. Disconnect spark plug high tension lead (B) from spark plug.
3. Connect D05351ST Spark Tester terminal (C) to spark plug high tension lead (B).
4. Connect tester alligator clip (D) to engine grounding nut.
5. Move key switch to RUN position.
6. Move throttle lever to SLOW idle detent position.
7. Pull recoil starter quickly through full range of motion and watch tester for spark condition.

Results:

If Strong Spark Appears . . . . .Spark Plug Defective
. . . . . .or Air Gap Mis-Adjusted
If Weak Spark Appears . .Ignition Module Defective
. . . . . .or Air Gap Mis-Adjusted
. . . . . .or Flywheel Magnets Weak
. . . . . .or High Tension Lead Defective
If No Spark Appears. . . . .Ignition Module Defective
. . . . . or Flywheel Magnets Defective
. . . . . .or High Tension Lead Defective
. . . . . or Key Switch or Lead Defective

NOTE: If it is determined that the ignition module is defective, replace it. The ignition module does not have serviceable parts.

(See “REPAIR” on page 32 for appropriate procedures to correct defects.)

CRANKCASE VACUUM TESTS

Reason:

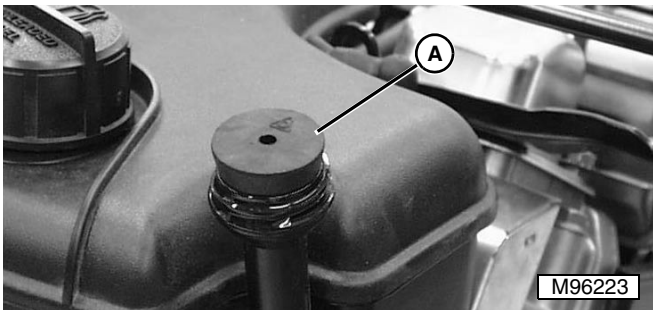
To determine the condition of the piston, rings, cylinder wall and valves.

Vacuum Gauge Procedure:

Equipment:

- JT03503 Vacuum Gauge Test Kit

IMPORTANT: DO NOT install test line with barbed fitting into rubber plug hole until engine is warm and running at FAST idle. Otherwise test gauge may be damaged, especially during engine cranking and shutdown modes.

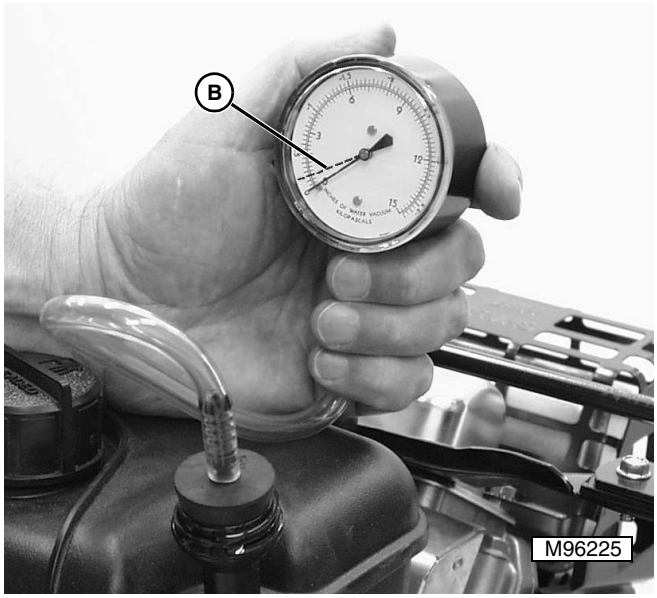


1. Remove dip stick and install a #6 rubber plug (A) from JT03503 Vacuum Gauge Kit so it seals tightly inside fill tube lip.

2. Attach shop exhaust system to muffler. After starting engine, quickly cover rubber plug hole and run engine at FAST idle to warm engine.

⚠ CAUTION

Engine components are HOT and may cause injury to exposed skin. Wear protective gear.



3. Once engine is warm and while running at FAST idle, quickly install barbed fitting and test line all-the-way into plug hole and record reading.
4. **While engine is still running at FAST idle**, remove test line and barbed fitting from plug and quickly cover hole.
5. Move throttle lever to SLOW idle and stop engine.

Specification:

Minimum Water Movement . . . . . 25 mm (1.0 in.)

Results:

If crankcase vacuum is low, reading stays below broken line (B), inspect for:

- Damaged or worn breather,
- Excessive breather air gap,
- Damaged or worn seals and/or gaskets,
- Damaged or worn piston rings.

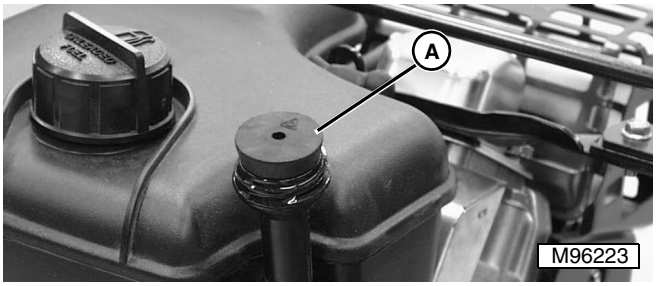
U-Tube Manometer Procedure:

Equipment:

- JT05697 U-Tube Manometer Test Kit

1. Perform preliminary test set-up procedures using JT05697 U-Tube Manometer Crankcase Vacuum Test Kit and enclosed kit instructions.

IMPORTANT: DO NOT install test line with barbed fitting into rubber plug hole until engine is warm and running at FAST idle. Otherwise colored test water will be sucked into crankcase, especially during engine cranking and shutdown modes.

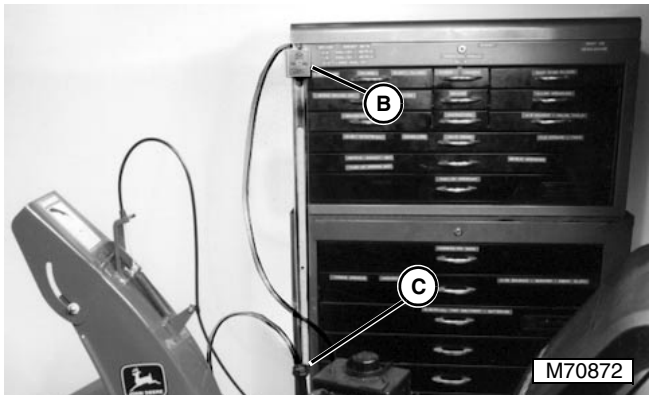


2. Remove dip stick and install a #6 rubber plug (A) from JT05697 U-Tube Manometer Test Kit so it seals tightly inside fill tube lip.

3. Attach shop exhaust system to muffler. After starting engine, quickly cover rubber plug hole and run engine at FAST idle to warm engine.

⚠ CAUTION

Engine components are HOT and may cause injury to exposed skin. Wear protective gear.



4. Once engine is warm and running at FAST idle, quickly install barbed fitting and test line from the U-tube manometer (B) all-the-way into plug hole (C) and record reading.
5. **While engine is still running at FAST idle**, remove test line and barbed fitting from plug and quickly cover hole
6. Move throttle lever to SLOW idle and stop engine.

Specification:

Minimum Water Movement . . . . . 25 mm (1.0 in.)

Results:

If crankcase vacuum is low, inspect for:

- Damaged breather or
- Excessive breather air gap,
- Damaged or worn seals and/or gaskets,
- Damaged or worn piston rings.

GOVERNOR ADJUSTMENT (STATIC)

Reason:

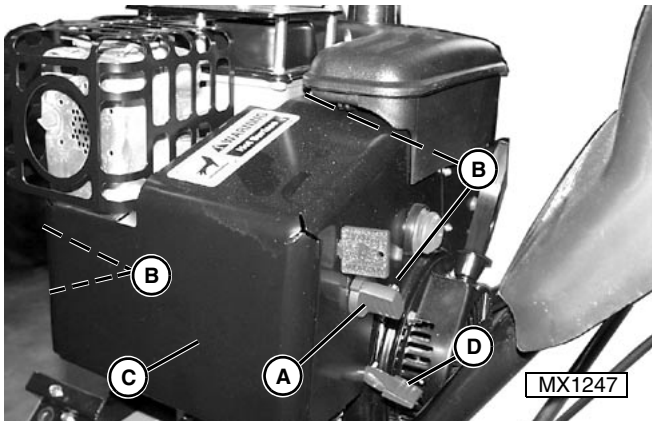
Removes all free-play of internal and external linkages, helping eliminate or minimize surging or erratic running of engine.

ATTENTION!

DO NOT attempt to disassemble or adjust the engine CARB/EPA Certified Emissions Carburetor unless you are a factory trained technician with authorization to service CARB/ EPA Certified Emissions Carburetors.

Procedure:

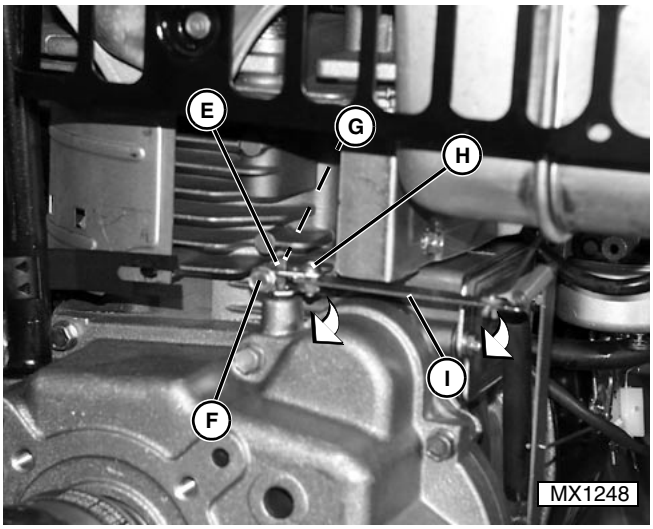
1. STOP engine and allow engine to cool.



2. Remove choke control knob (A) and four cap screws (B) to separate carburetor cover (C) from muffler shield and engine. DO NOT disconnect key switch electrical lead or remove muffler shield.

3. Move throttle lever (D) into FAST idle position.

NOTE: DO NOT remove throttle link or governor spring from their original factory settings. Mark holes or make special note of their pre-set positions.



1332DDE model shown (other models similar)

4. Remove screw and panel covering governor paddle clamp (E) area.
5. Make sure governor paddle clamp (E) and screw (F) are tight on external end of internal governor paddle (G).
6. Loosen governor arm screw and lock nut (H) then rotate governor paddle (G) and clamp (E) toward front of unit until they stop — hold this position.
7. Pull governor arm (I) toward front of unit to fully open the throttle–hold this position. Tighten governor arm screw and lock nut (H). DO NOT allow linkage to move.
8. Hold this position and check for solid linkage from internal governor spool to carburetor throttle plate in FAST idle position (Wide Open Throttle - WOT).

FAST IDLE SPEED ADJUSTMENT

Reason:

To achieve proper fast idle rpm setting to provide adequate speed for optimum performance of the engine during working conditions.

Equipment:

- JT07270 Digital Pulse Tachometer

Procedure:

1. STOP engine and remove carburetor cover.
2. Perform static governor adjustment first. (See "GOVERNOR ADJUSTMENT (STATIC)" on page 26.)

ATTENTION!

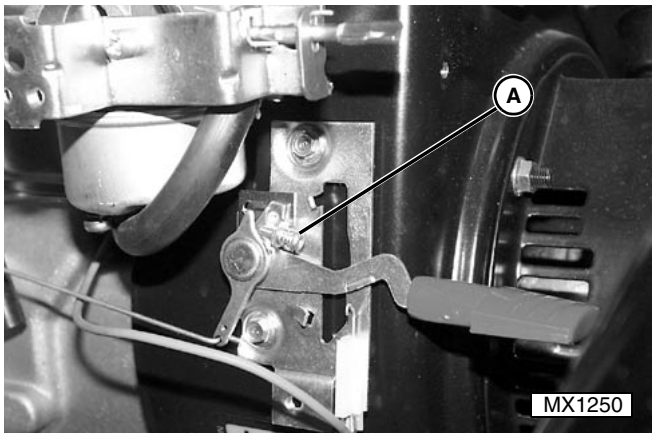
Fast idle is adjusted to comply with EPA emissions requirements by the engine manufacturer. Fast idle can only be adjusted by an EPA authorized diesel service center. Tampering with the fast idle adjustment by unauthorized personnel will void the engine warranty and result in fines.

3. Attach shop exhaust system to muffler and run engine at FAST idle to warm engine to operating temperature (3 - 5 minutes).

⚠ CAUTION

Engine components are HOT and may cause injury to exposed skin.

4. Follow digital pulse tachometer instructions to check engine rpm's.



5. Using FAST idle screw (A), adjust FAST idle speed to specification.

Specification:

FAST Idle Speed . . . . . 3600 ± 150 rpm

GOVERNED IDLE SPEED SCREW ADJUSTMENT—1332DDE

Reason:

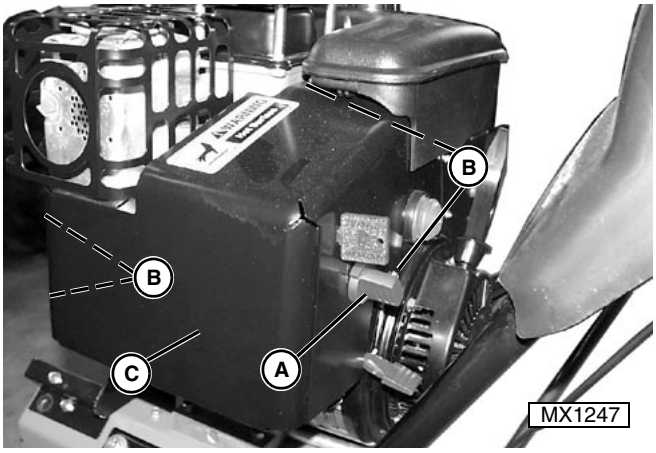
To achieve proper slow idle rpm setting for proper governor response to a crankshaft load. Provides adequate rpm to keep the engine running smoothly when under a load.

Equipment:

- JT07270 Digital Pulse Tachometer

Procedure:

1. STOP engine and allow engine to cool.

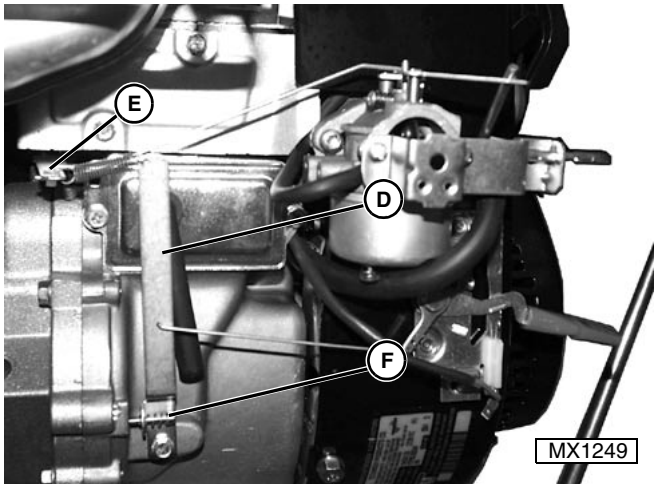


2. Remove choke control knob (A) and four cap screws (B) to separate carburetor cover (C) from muffler shield and engine. DO NOT disconnect key switch electrical lead or remove muffler shield.
3. Attach shop exhaust system to muffler and run engine at FAST idle to warm engine to operating temperature (3 - 5 minutes).

⚠ CAUTION

Engine components are HOT and may cause injury to exposed skin.

4. Follow digital pulse tachometer instructions to check engine rpm's.



5. Pushing the governor lever (D) towards the governor lever (E), adjust the SLOW idle screw (F), to specification.

Specification:

Slow Idle Speed . . . . . 600 rpm higher than . . . . . slow idle stop screw

SLOW IDLE STOP SCREW ADJUSTMENT

ATTENTION!

DO NOT attempt to disassemble or adjust the engine CARB/EPA Certified Emissions Carburetor unless you are a factory trained technician with authorization to service CARB/ EPA Certified Emissions Carburetors.

Reason:

To achieve proper slow idle rpm setting. Provides adequate rpm to keep the engine running smoothly without stalling.

Equipment:

- JT07270 Digital Pulse Tachometer

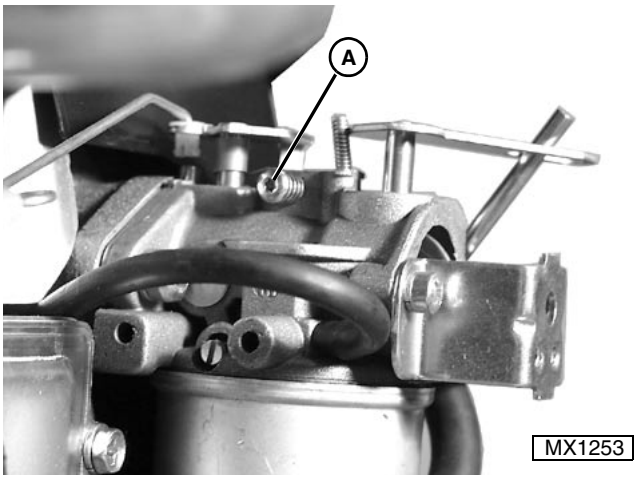
Procedure:

The following preliminary adjustments should allow you to start the engine:

IMPORTANT: Turn screws finger tight only. DO NOT overtighten or you may damage needle machined surface.

1. Start and warm up engine (3 - 5 minutes).

2. Move throttle lever down into SLOW idle position.
3. Follow digital pulse tachometer instructions to check engine rpm's.



4. Using SLOW idle stop screw (A), adjust SLOW idle stop speed to specification.

Specification:

Slow Idle Stop Speed. . . . . 2000 ± 150 rpm

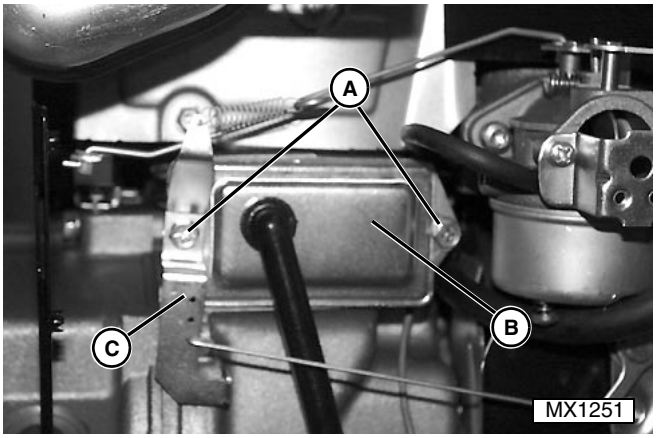
CRANKCASE BREATHER ASSEMBLY TEST

Reason:

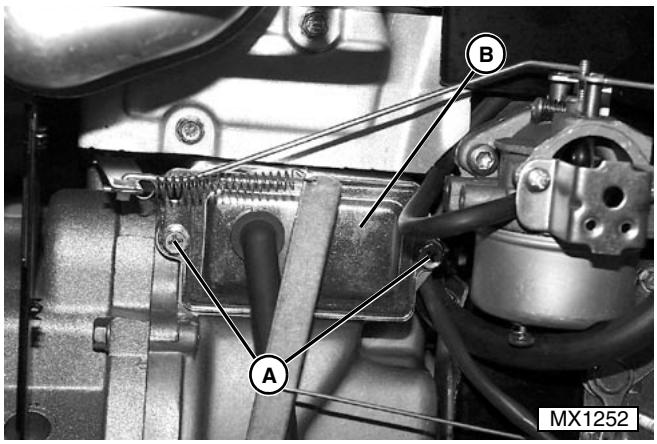
To inspect and clean breather assembly for longer engine life.

Removal:

1. STOP engine and allow to cool completely.
2. Remove carburetor cover.



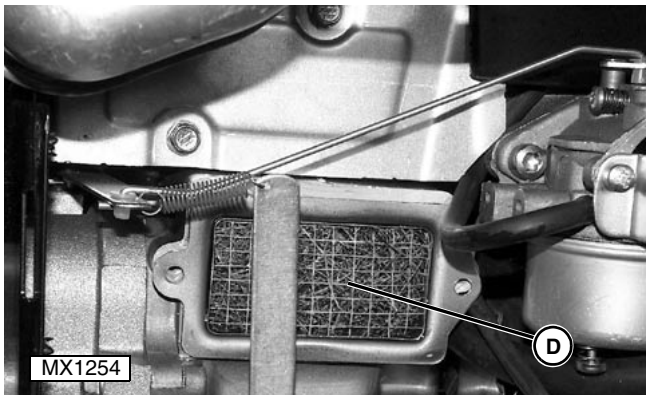
924DE, 1128DE, and 1128DDE



1332DDE

3. Remove cover screws (A) and remove breather cover (B).

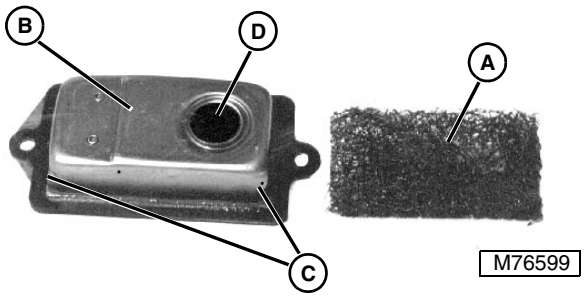
NOTE: Be careful on 924DE, 1128DE, and 1128DDE models so that governor arm (C) is properly detached before removal of screws/breather cover.



1332DDE model shown (other models similar)

4. Remove breather assembly, element, and gasket (D).
5. Clean and inspect breather. (See next procedure.)

Inspection:



1. Clean element (A) and bowl (B) with solvent. Blow dry.
2. Check that drain holes (C) in assembly housing are open.
3. Check that reed valve (D) moves freely and closes when released. Inspect the reed valve body. The reed valve must be in good condition and not distorted which would allow air flow in both directions.
4. If reed valve air gap is equal to or greater than specification anywhere around sealing circle, replace entire breather assembly with new parts, including gaskets.

Specification:

Reed Valve Air Gap (Max.). . . . . 0.25 mm (0.010 in.)

Installation:

NOTE: Install breather assembly with drain holes on bottom.

1. Install gasket on engine side of breather assembly, and place assembly in engine block recess.
2. Install gasket and cover over breather assembly, and tighten screws to **13 N•m (115 lb-in.)**.
3. Install new gaskets with intake manifold and carburetor, then install carburetor cover. (See appropriate procedures in this section.)

Results:

- Replace gasket or filter element if they show excessive wear. Replace entire breather assembly if the bowl has any defects.

VALVE-TO-ROCKER ARM CLEARANCE TEST

Reason:

To eliminate interference by the compression release mechanism on the cam gear when adjusting valve clearance.

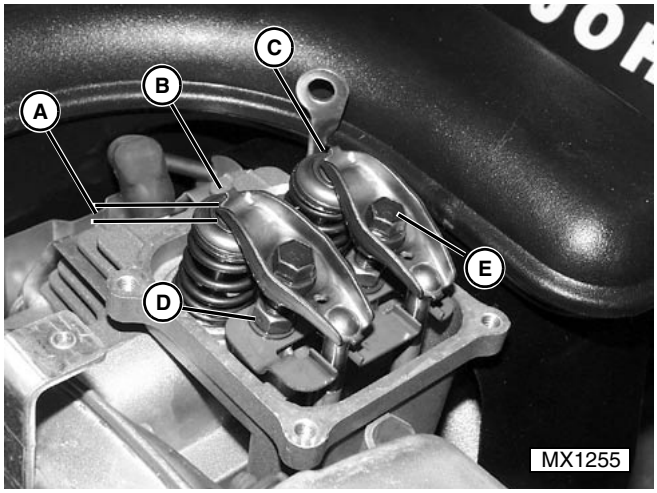
Equipment:

- Flat Feeler Gauge

Procedure:

NOTE: Valve clearance should be checked whenever valve cover is removed, any valve grinding has been performed, or new valves are installed.

1. Engine must be cooled completely before performing this procedure.
2. Remove valve cover.
3. Rotate crankshaft until piston is at top-dead-center of the compression stroke, both valves closed.



4. Check specification clearance (A) between contact surface of the intake (B) and exhaust (C) rocker arms and valve stem using a flat feeler gauge.

Specification:

Valve-To-Rocker Arm Clearance 0.10 mm (0.004 in.)

5. If clearance is out of specification, loosen lock nut (D) and turn pivot ball screw (E) in appropriate direction to obtain specified clearance. Hold pivot ball screw (E) stationary, once specified clearance (A) is obtained, while tightening lock nut (D) to **13.5 N•m (120 lb-in.)**.
6. Install new valve cover gasket.
7. Install valve cover and tighten studs to **6 N•m (55 lb-in.)**.
8. Connect breather hose to barbed fitting of valve cover and route breather tube down toward carburetor bowl, same as before removal.

Results:

- If specification cannot be obtained, cylinder head and valve train must be reconditioned or replaced. (See appropriate procedures in “REPAIR” on page 32.)

AUTOMATIC COMPRESSION RELEASE (ACR) TEST

Reason:

To test the function of the Automatic Compression Release (ACR) mechanism on the camshaft.

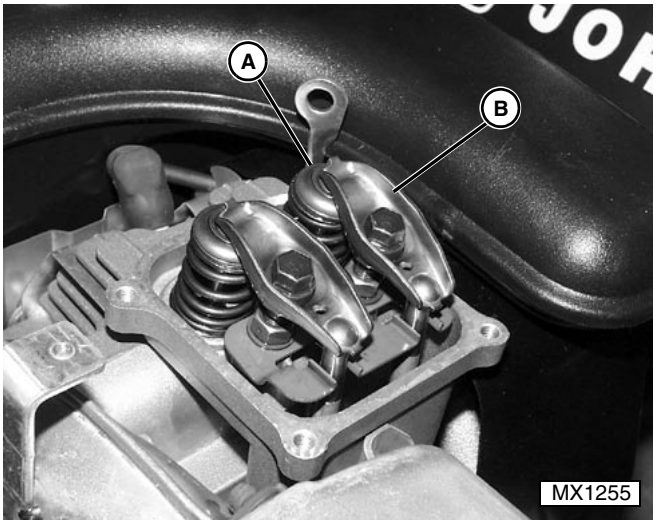
Equipment:

- JDM74A-5 Spark Plug Ground Tool

Procedure:

1. Disconnect spark plug high tension lead and ground it with JDM74A-5 Spark Plug Ground Tool to protect the ignition system.
2. Remove valve cover.

NOTE: ACR for 924DE, 1128DE, and 1128DDE are similar and follow this same procedure.



1332DDE Shown (other models similar)

3. Watch for slight movement in exhaust valve (A) and rocker arm assembly (B) as crankshaft is rotated through engine compression cycle.
4. Install new gasket.
5. Install valve cover.

Results:

- If no movement is detected, ACR mechanism is defective and must be repaired or replaced. (See “CAMSHAFT AND FOLLOWERS” on page54.)

CRANKSHAFT END PLAY MEASUREMENT

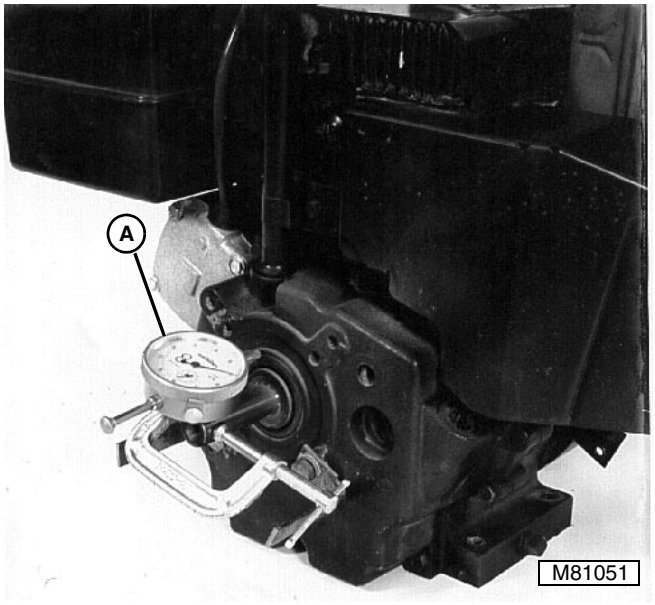
Reason:

To test crankcase bearing/cover wear.

Equipment:

- JT07363 Dial Indicator Kit

Procedure:



1. Pull crankshaft outward as far as it will go.
2. Install a dial indicator (A) on crankshaft with pointer flush against crankcase cover. Set scale on dial indicator to “zero”.
3. Move crankshaft in and out. Record this measurement.

Specification:

Crankshaft End Play
All Models . . . . . 0.05 - 1.06 mm (0.002 - 0.042 in.)

Results:

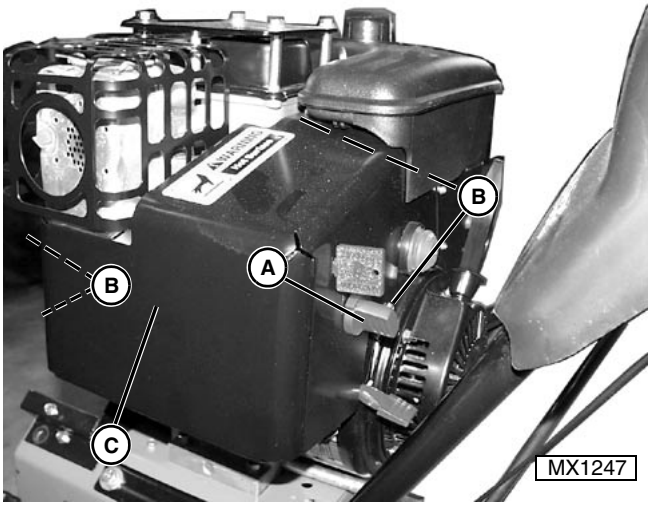
- Replace crankcase cover if end play is not within specification. (See “CRANKCASE COVER” on page 48.)

REPAIR

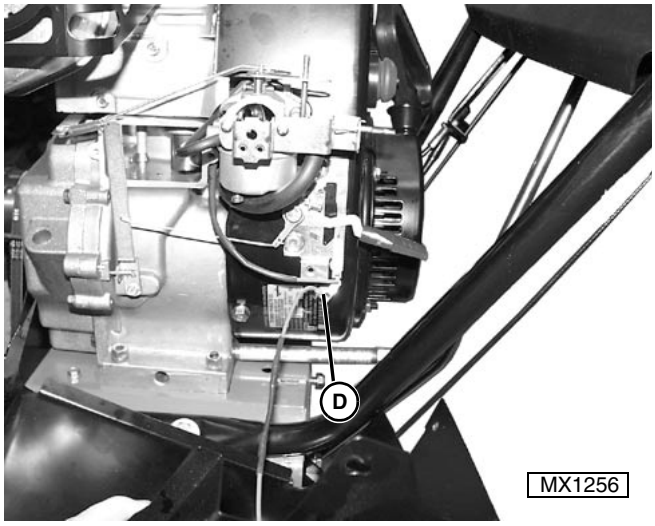
CARBURETOR COVER

Removal and Installation:

1. Stop engine and allow engine to cool.



2. Remove choke control knob (A) and four cap screws (B) to separate carburetor cover (C) from muffler shield and engine. DO NOT remove muffler shield.



3. Disconnect key switch ignition module ground wire (D) to set cover aside.
4. Installation is done in reverse order of removal.

CARBURETOR (CARB/EPA CERTIFIED)

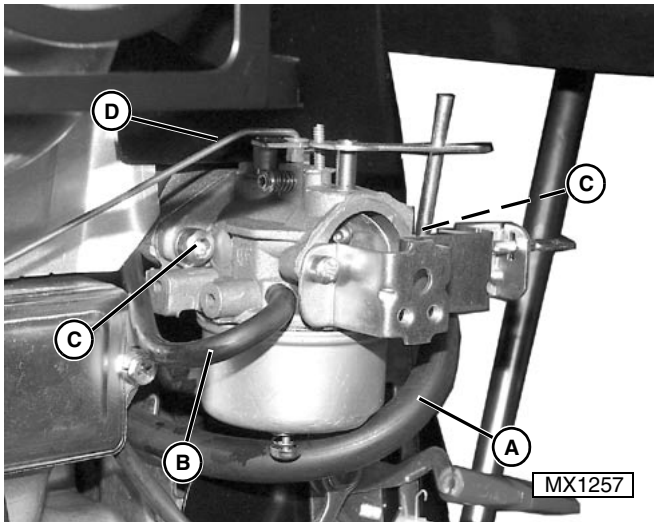
Removal:

1. Turn shut-off valve at fuel tank to OFF position.

⚠ CAUTION

Gasoline is explosive. Do not expose to spark or flame. Serious personal injury can result.

2. Remove carburetor cover. (See CARBURETOR COVER on page 32.)



3. Disconnect fuel line (A) and primer line (B).

IMPORTANT: Note in which holes governor link is installed before removal, this is manufacturers pre-set position.

4. Remove torx screws (C).
5. Remove carburetor and governor link (D).
6. Remove gasket and discard.

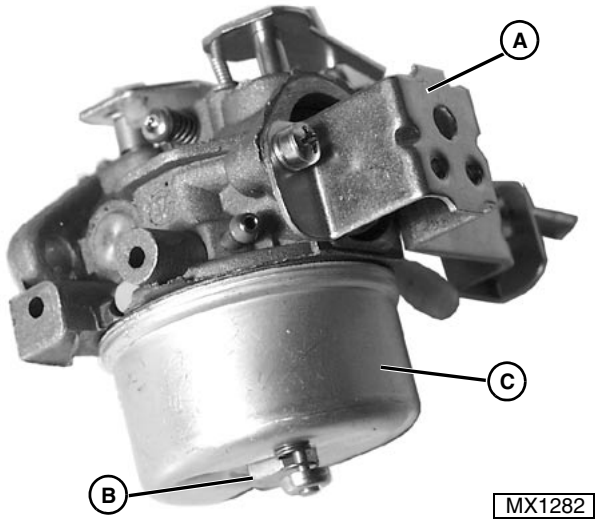
Installation:

1. Install governor link in manufacturers pre-set holes, as noted in removal procedure.
2. Install new gasket and carburetor. Tighten torx screws to **8 N•m (70 lb-in.)**.
3. Connect fuel and primer lines.
4. Install carburetor cover.
5. Open fuel shut-off valve.
6. Make all carburetor adjustments. (See all appropriate procedures found earlier in this section.)

Disassembly:

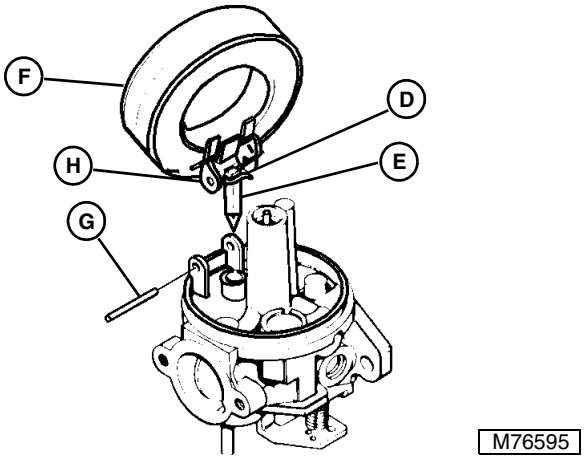
ATTENTION!

DO NOT attempt to disassemble or adjust the engine CARB/EPA Certified Emissions Carburetor unless you are a factory trained technician with authorization to service CARB/ EPA Certified Emissions Carburetors.



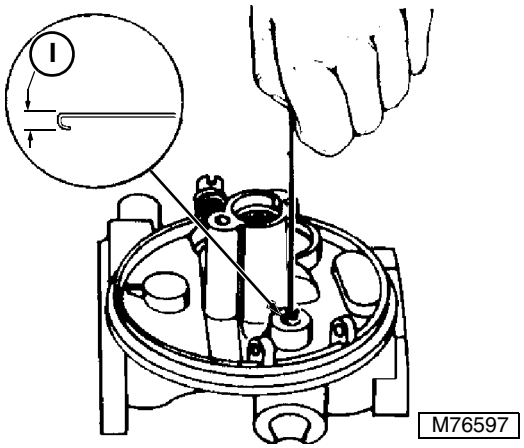
1332DDE Model shown (other models similar)

1. Remove:
   - Mounting bracket (A)
   - Bowl nut (B)
   - Float bowl (C)

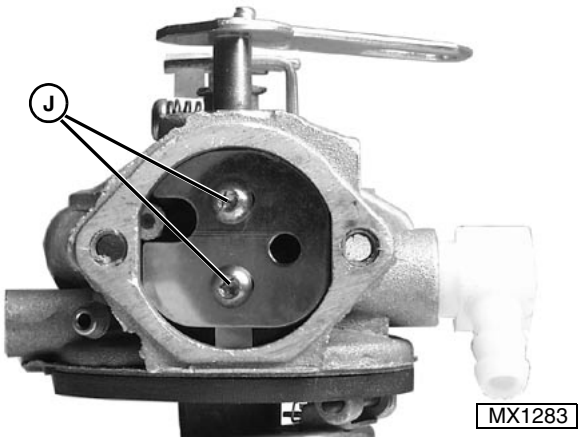


2. Note the position of the spring clip (D) on the inlet needle (E) and float (F). Remove float hinge pin (G) with needle nose pliers. Note the position of the hooks (H) before removing the float hinge pin.

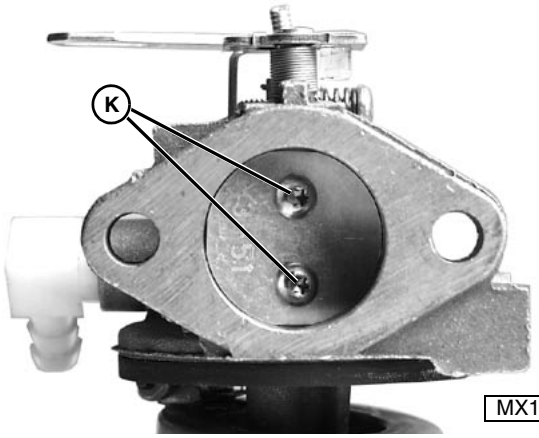
3. Remove float (F), clip (D), and inlet needle (E).



4. Remove the inlet needle seat using a wire or paper clip with a 3/32 in. hook end (I) as shown. Push the hook through the hole in the center of the seat to remove it.

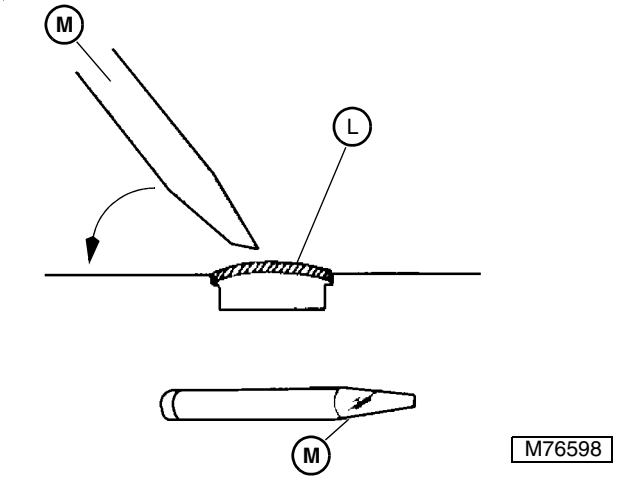


5. Note or mark the action of the choke shutter and the insertion point of the choke return spring located next to the choke shaft. Remove the choke shutter and choke shaft by removing the torx screws (J) that attach the shutter to the shaft.



6. Note or mark the action of the throttle plate and the hook point of the throttle return spring located on the top of the throttle shaft. Remove the throttle plate, spring, and throttle shaft by removing the torx screws (K) that attach the plate to the shaft.

IMPORTANT: DO NOT remove any ball or cup plugs! DO NOT allow point of chisel to come in contact with carburetor body or internal channels below welch plugs.



7. Remove welch plugs (L) with small chisel (about 1/8 in. wide at tip) (M). Pry out plug, as directed by the arrow, above. DO NOT damage carburetor body.

IMPORTANT: DO NOT clean internal carburetor holes or passages with small drill bits or wire. DO NOT remove parts not shown in illustrations.

8. Clean only metal parts in carburetor cleaner, for **30 minutes maximum**.
9. Spray all passages with carburetor cleaning spray to verify that all internal passages are open.

IMPORTANT: Rinse carburetor in warm water to neutralize corrosive action of cleaner on aluminum.

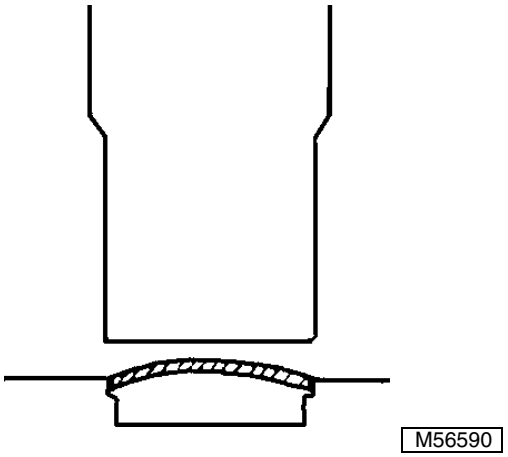
10. Rinse carburetor with warm water and dry using compressed air. DO NOT use cloth or paper to dry parts; lint can plug holes or passages.
11. Inspect all parts for wear or damage, replace as necessary.

Assembly:

Equipment:

- 4.37 mm (11/64 in.) Drill Bit
- 3.97 mm (5/32 in.) Flat Face Punch

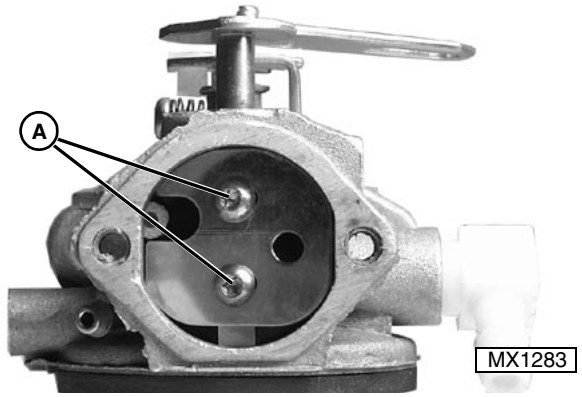
Welch Plugs—



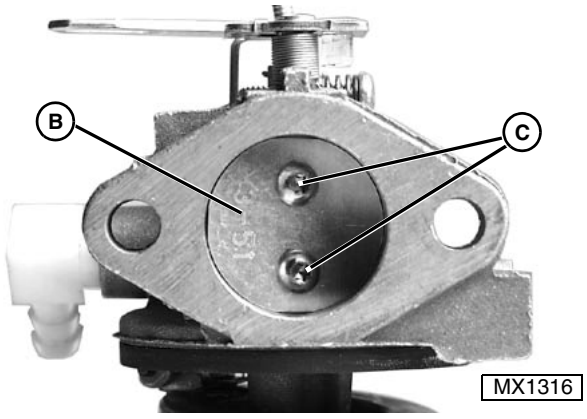
IMPORTANT: DO NOT dent or drive the center of welch plug below the top surface of the carburetor body.

1. Place carburetor body in padded jaw vise. Place welch plug in body opening with raised portion up.
2. Using a flat nose punch of equal or slightly larger diameter than welch plug, drive welch plug into bore until you slightly flatten crown of welch plug.
3. Seal outer diameter of welch plug with nail polish or equivalent.

Choke and Throttle Shafts and Plates—



1. Install choke plate with flat end of plate facing down toward float bowl, and attach with torx screws (A).

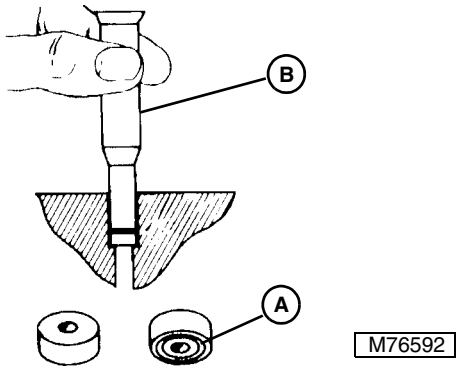


2. Install throttle plate with stamped coding numbers (B) on the left side of throttle shaft, and attach with torx screws (C).
3. Check for free movement of plate assembly.

Main Nozzle—

1. Clean bowl nut/main nozzle with a small wire or similar device.
2. Install a new O-ring onto bowl nut.

Inlet Needle Seat—



1. Make sure seat cavity is clean.
2. Moisten outer seat surface with oil and insert seat with groved side down (A).

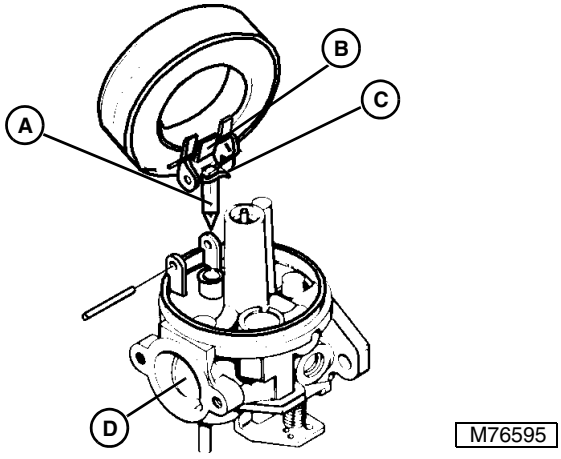
IMPORTANT: DO NOT use excess force while installing inlet needle seat.

3. Press seat into cavity with a 5/32” flat face punch (B) close to diameter of the seat.

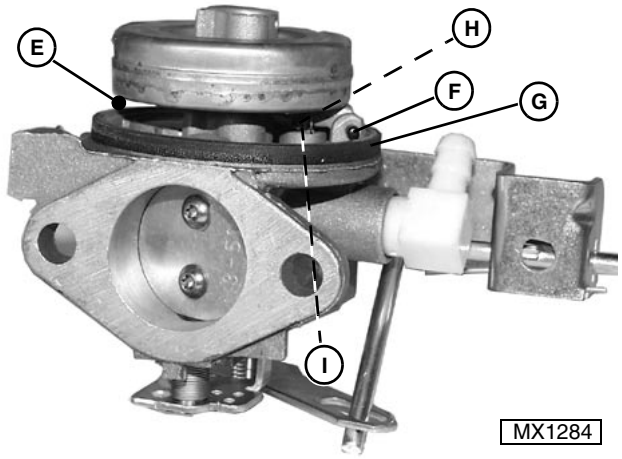
Inlet Needle and Float—

1. Invert carburetor.
2. Remove and discard bowl gasket.

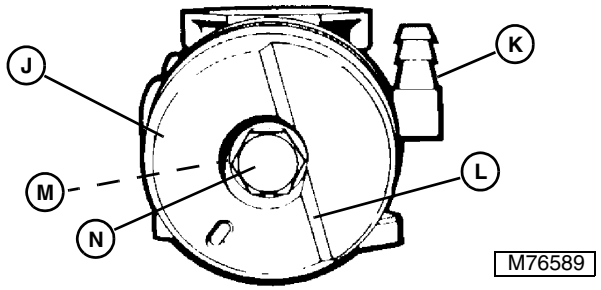
.



3. Inlet needle (A) hooks onto float tab (B) by means of a spring clip (C). To prevent binding, long, straight end of spring clip should face choke plate side (D) of carburetor as shown above.



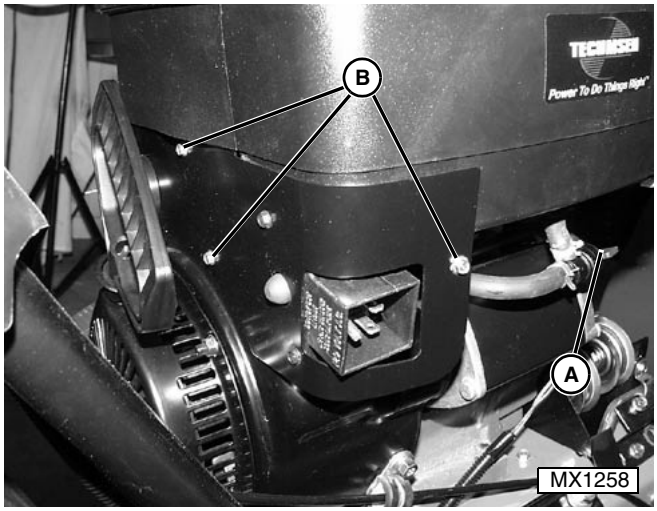
4. Set float height by using **4.37 mm (11/64 in.)** drill bit (E) on side opposite float hinge pin (F), without bowl gasket (G) installed, and bending float tab (H) until inlet needle (I) is properly seated on inlet needle seat.
5. Remove drill bit and install new bowl gasket on flanged face of carburetor casting.



6. Install float bowl with deep portion (J) on opposite side of fuel inlet (K) with deep wall (L) parallel to float hinge pin to allow full movement of the float.
7. Install new gasket (M) and tighten bowl nut (N) to **5.65 N•m (50 lb-in.)**.

FUEL TANK

Removal:

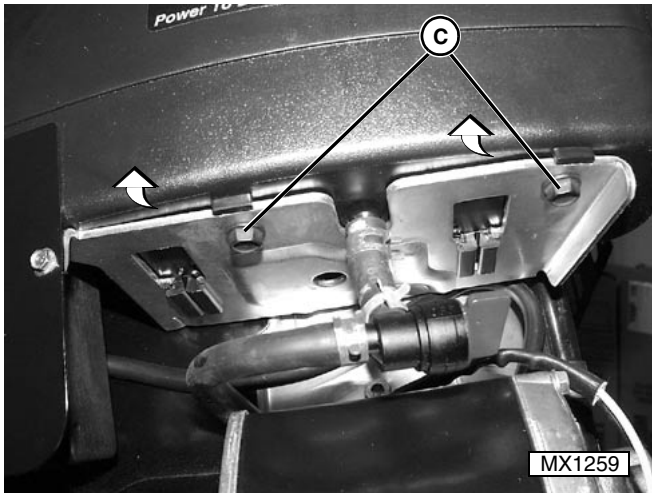


1. Turn shut-off valve (A) to OFF position.

⚠ CAUTION

Gasoline is explosive. DO NOT expose to spark or flame. Serious personal injury can result. Wipe-up any spilled gasoline IMMEDIATELY.

2. Disconnect fuel line at valve.
3. Remove three cap screws (B), and lower starter switch and cover away from engine.



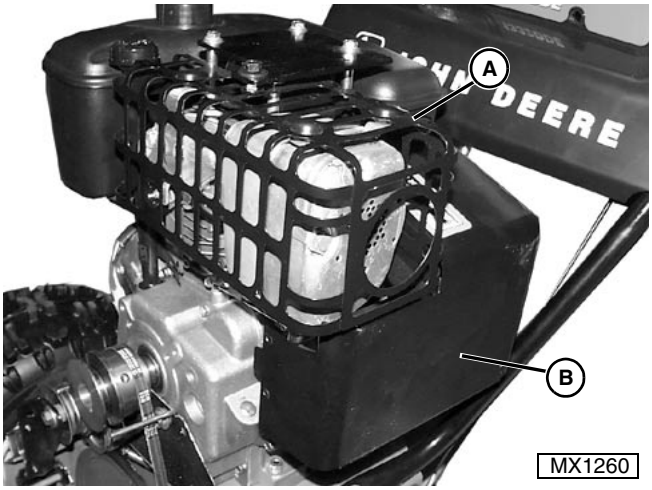
4. Remove two lower bolts (C) from tank, and slide tank out of tabs, tilt back and remove from lower bracket.

Installation:

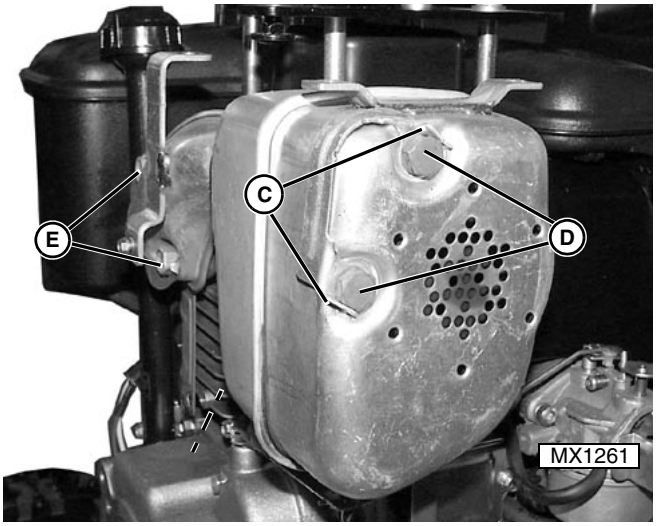
1. Install tank in reverse order of removal.
2. Tighten cap screws to **11.3 N•m (100 lb-in.)**.
3. OPEN shut-off valve.

MUFFLER

Removal:



1. Remove shield (A) and carburetor cover (B).



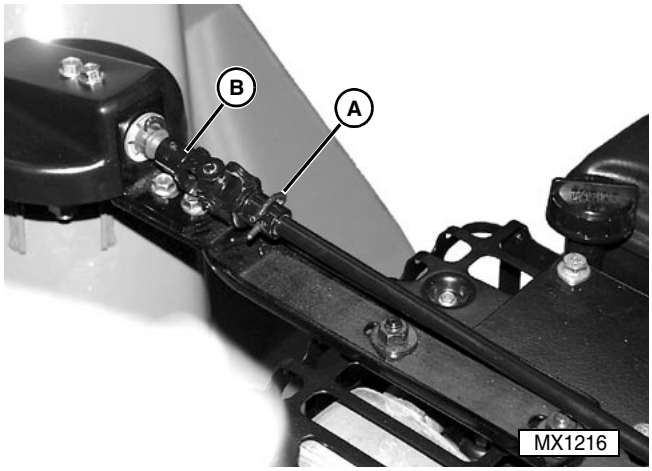
2. Using a screw driver or a blunt chisel bend back retaining ears (C) on muffler face.
3. Remove two mounting cap screws (D) to remove muffler.
4. Remove muffler and gasket.
5. If necessary, remove exhaust manifold cap screws (E), inspect manifold, and replace gasket. Tighten cap screws (E) to **18 N•m (160 lb-in.)**
6. Clean mating surfaces of any gasket residue.

Installation:

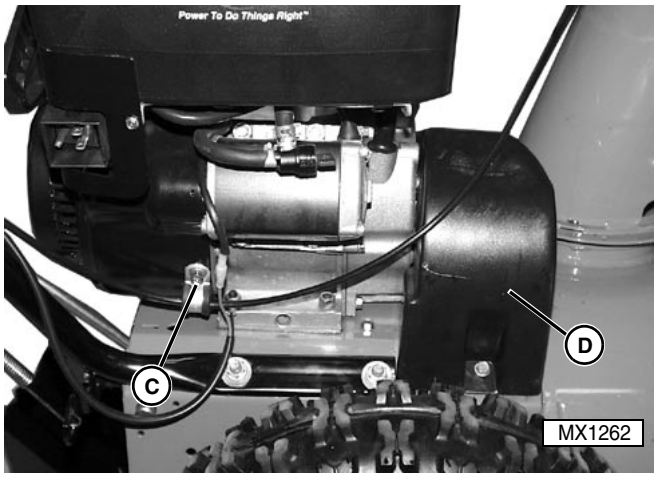
1. Install new gasket and original muffler.
2. Install cap screws (D) through muffler.
3. Tighten two mounting cap screws to **22.5 N•m (200 lb-in.)**.
4. Bend retaining ears (C) against heads of cap screws.

ENGINE

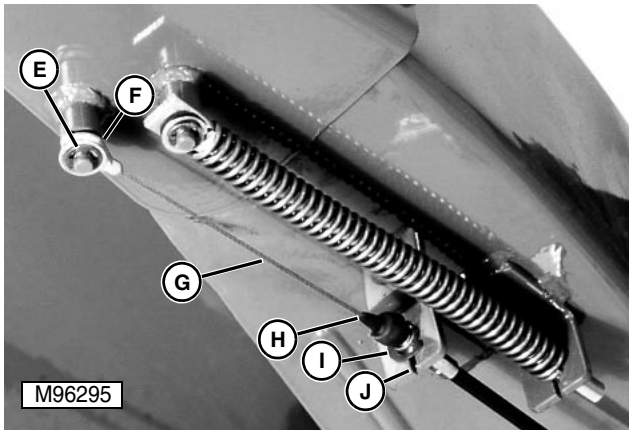
Removal and Installation:



1. Remove cotter pin or quick pull pin (A) to disconnect spout rotation crankshaft (B) from gearbox shaft.
2. Slide crankshaft (B) rearward through operator station shroud hole until shaft is clear of engine.

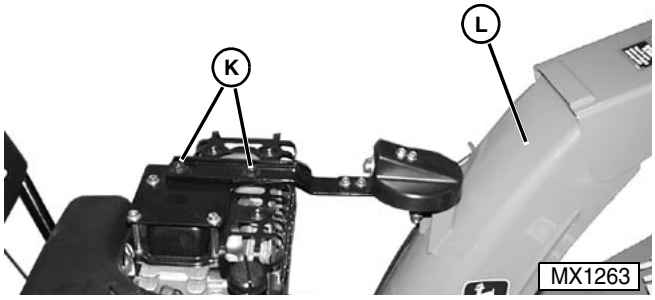


3. Remove spout deflector cable grommet (C) from right side of engine.
4. Remove drive belt cover (D).

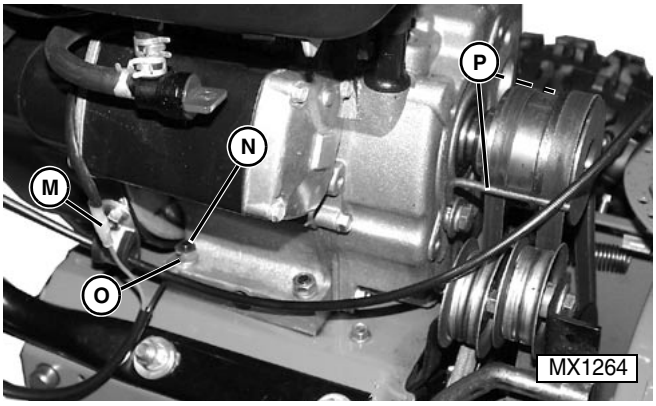


1128DE Model shown (others models similar)

5. Remove E-rings (E) and (I).
6. Slide eyelet (F) off stud and carefully pull rubber seal (H) off end of cable so it hangs freely on wire (G).
7. Pull cable end out of bracket hole and slide wire (G) through bracket slot (J) and move cable to right side of frame.



8. Remove two lock nuts, washers, and bolts (K) from spout support then tilt spout (L) forward.
9. After tilting spout forward, lift it from tab to remove it from blower housing.

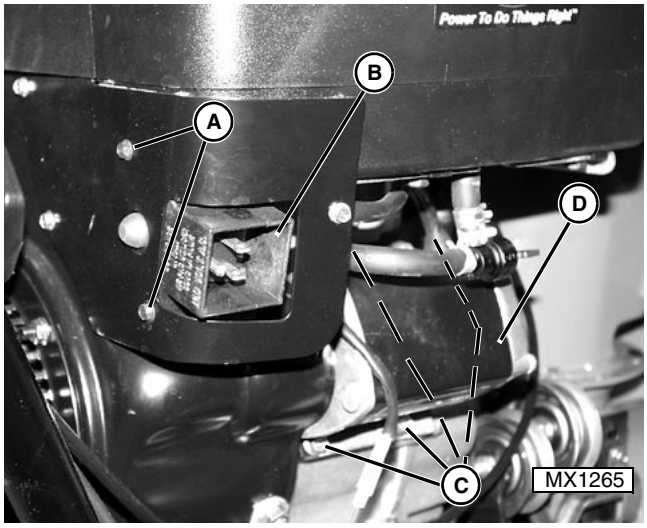


1128DE Model shown (other models similar)

10. Disconnect green headlight lead (M) from stator/ alternator wiring connector and remove right-rear engine mounting nut and lock washer (N) to remove headlight ground eyelet (O).
11. Loosen belt guides (P) to remove drive belts from drive sheaves.
12. Remove remaining three engine mounting nuts and lock washers (N) from both sides of engine.
13. Attach an overhead hoist or get a helper to safely lift engine from frame to workbench.
14. Installation is done in reverse order:
    - Safely install engine on frame;
    - Install headlight ground eyelet on right-front stud and tighten all four engine mounting lock washers and nuts to **22.5 N•m (200 lb-in.);**
    - Connect headlight green lead to engine stator/ alternator wiring connector;
    - Set belt guides to within **3.2 mm (1/8 in.)** from widest drive sheave and tighten to **8 N•m (70 lb-in.);**
    - Install drive belt cover and tighten cap screws to **4.7 N•m (2.8 lb-ft);**
    - Install spout assembly and tighten spout support bolts, washers, and lock nuts to **8 N•m (70 lb-in.)**;
    - Install spout deflector cable to left side of spout assembly and cable grommet on right-side of engine. Tighten cap screw to **8 N•m (70 lb-in.)**;
    - Connect spout rotation crankshaft to gearbox shaft and fasten with quick pull pin. DO NOT fasten with cotter pin, use a quick pull pin.

STARTING MOTOR

Removal and Installation:



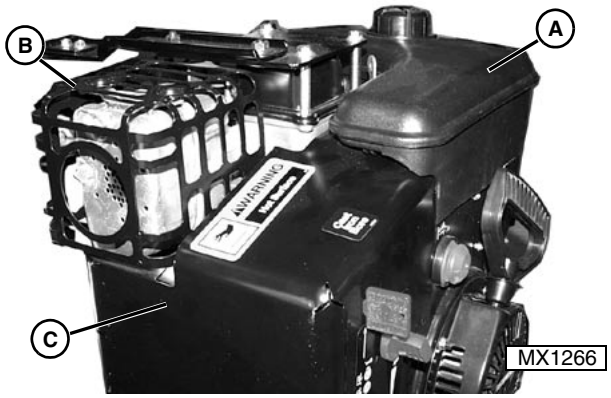
1128DE Model shown (all other models similar)

1. Remove two cap screws (A) to remove electrical terminal (B) and four cap screws (C) to remove optional starter motor (D).
2. Install in reverse order. DO NOT over-tighten two cap screws (A) or threads will become stripped.
3. Tighten cap screws (C) to **7.5 N•m (65 lb-in.)**.

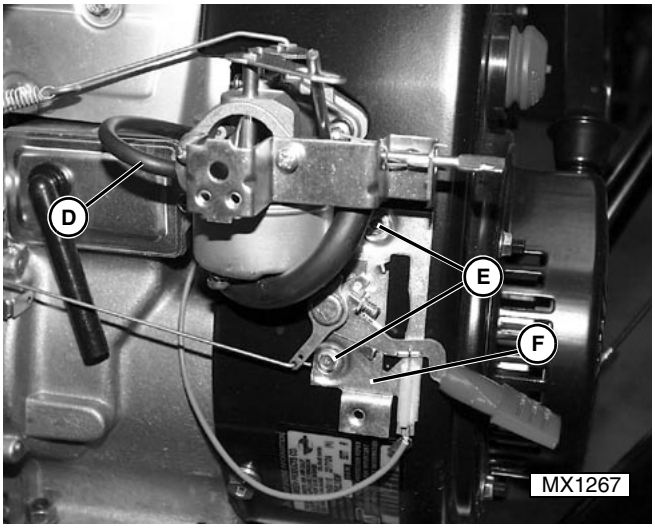
ENGINE BLOWER HOUSING

Removal and Installation:

1. Remove engine and drain crankcase. Properly discard oil. (See “ENGINE” on page37.)



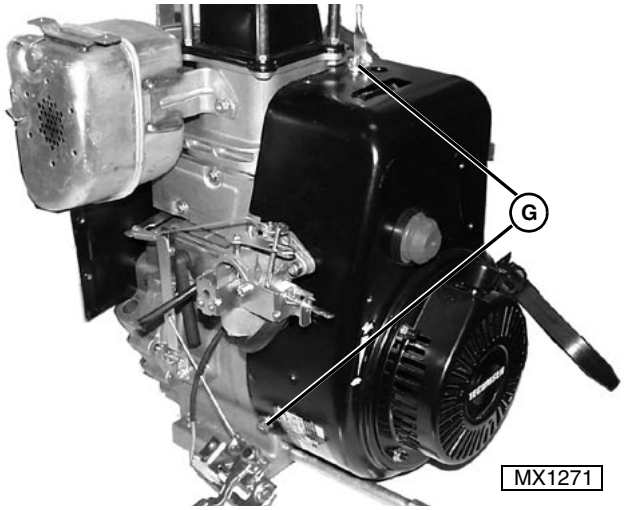
2. Remove gas tank (A), muffler shield (B), and carburetor cover (C). (See appropriate procedures earlier in this section.)



3. Disconnect primer hose (D) from carburetor.

IMPORTANT: DO NOT bend or damage throttle linkage, they are very thin and can be damaged easily—HANDLE WITH CARE.

4. Carefully remove two cap screws (E) to lay throttle control plate (F) beside engine.



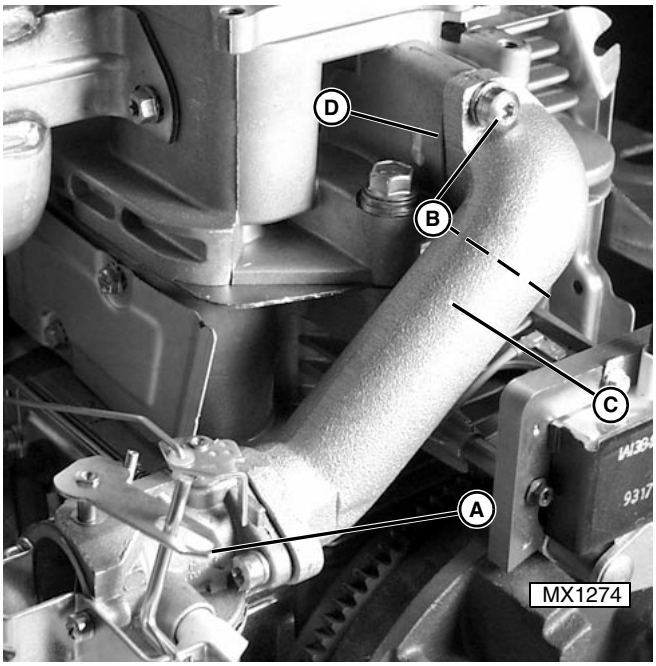
5. Remove two remaining cap screws (G) to remove blower housing.

6. Inspect blower housing, primer and hose, and recoil starter assembly. Repair or replace parts as necessary. (See appropriate procedures in this section.)
7. Install in reverse order. Tighten blower housing cap screws and throttle control plate cap screws to **22.5 N•m (200 lb-in.)**.

INTAKE MANIFOLD

Removal:

1. Remove carburetor cover, fuel tank, and blower housing (earlier in this section).



2. Remove carburetor (A). (See “CARBURETOR (CARB/EPA CERTIFIED)” on page32.)
3. Remove torx screws (B) securing manifold (C) to engine.
4. Remove manifold (C) and gasket (D).
5. Clean manifold and gasket surfaces of any gasket residue.

Installation:

1. Install new gasket and original or new intake manifold.
2. Tighten torx screws to specification.

Specification:

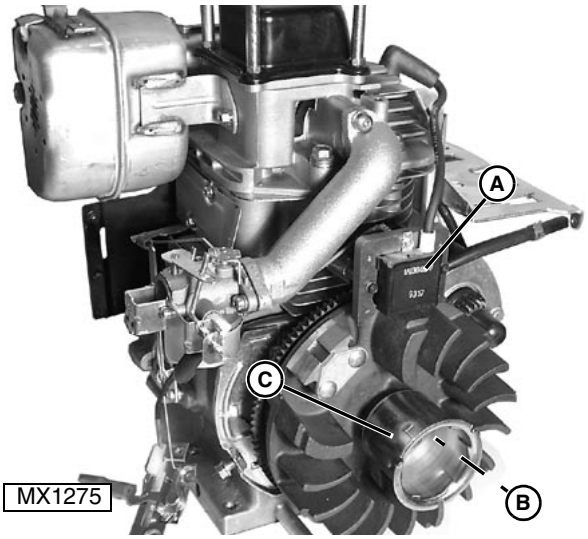
All models. . . . . 13 N•m (115 lb-in.)

3. Install new gasket and original carburetor. (See “CARBURETOR (CARB/EPA CERTIFIED)” on page 32 for appropriate model.)
4. Install carburetor cover, fuel tank, and blower housing (earlier in this section).

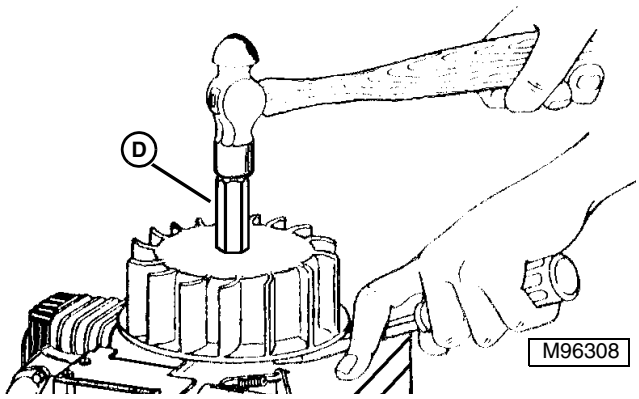
FLYWHEEL

Removal:

1. Remove engine. (See “ENGINE” on page37.)
2. Remove fuel tank.
3. Remove carburetor cover.
4. Carefully remove throttle plate from blower housing. DO NOT damage or bend linkage.
5. Remove electric starter kit.
6. Remove blower housing.

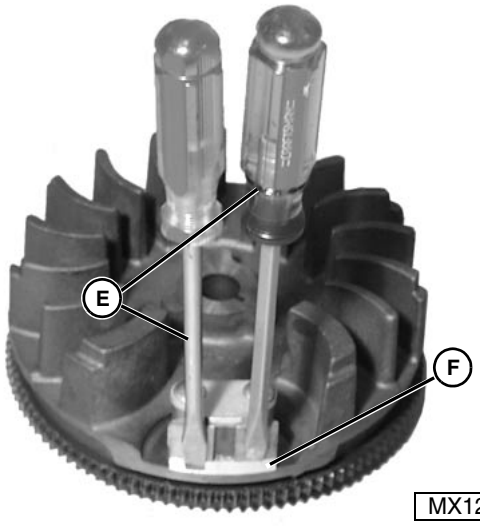


7. Remove ignition module (A).
8. Remove flywheel nut and belleville washer (B) to remove pull-start cup (C).



9. Remove flywheel, key, and spacer using appropriate size flywheel knock-off tool (D) (from engine manufacturer) and large bladed screwdriver or pry bar:
   - thread knock-off tool onto crankshaft until it bottoms-out, then unthread it one complete turn;
   - lift upward against underside of flywheel with large bladed screwdriver or pry bar;
   - using a large ball peen hammer, rap squarely and

sharply against head of knock-off tool—flywheel should pop loose.



10. Hold two screwdrivers (E) approximately **25 mm (1in.)** from flywheel magnet (F). Replace flywheel if one or both magnets do not forcefully attract and hold screwdrivers.
11. Inspect flywheel keyway, key, and crankshaft keyway for damage—replace components as necessary.
12. Inspect flywheel teeth and cooling fins for chips or cracks—replace flywheel as necessary.

Installation:

1. Flywheel installation is performed in reverse order:
   - tang on bottom of pull-start dog cup should be against one of three flywheel hub tangs;
   - bellville washer must be installed with concave towards top surface of cup basin;
   - lightly coat crankshaft mating surface and keyway, key, flywheel hub bore and keyway with John Deere Never-Seeze.
2. Tighten flywheel nut to specification.

Specification:

Flywheel nut . . . . . 79 N•m (58 lb-ft).

3. Install and adjust ignition module. (See “IGNITION MODULE” on page41.)
4. Install blower housing.
5. If used, install electric starter kit.
6. Carefully install throttle plate. DO NOT damage linkage.
7. Install carburetor cover.
8. Install fuel tank.

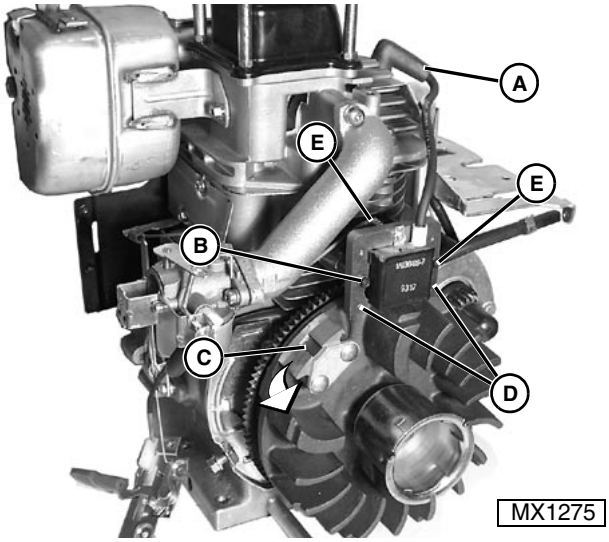
IGNITION MODULE

Equipment:

- Flat Blade Feeler Gauge

Removal:

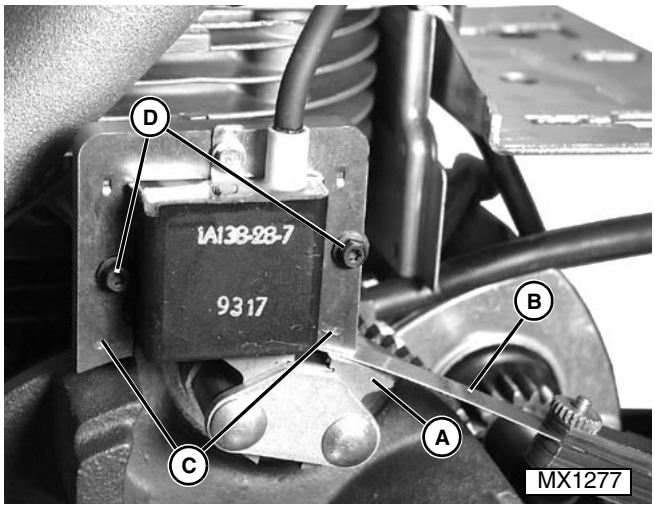
1. Remove blower housing. (See “ENGINE BLOWER HOUSING” on page39.)



2. Disconnect spark plug wire (A) and ignition module ground wire (B) from ignition module terminal.
3. Rotate flywheel until magnet (C) clears armature pick-up legs (D) of ignition module.
4. Remove two flanged torx cap screws (E) to remove ignition module.

Installation:

1. Install ignition module finger tight only with flywheel magnet turned away from ignition module.



2. Rotate flywheel magnet (A) in-line with ignition module and place specified feeler gauge (B) between each armature pick-up leg (C) and flywheel magnet then tighten flanged torx cap screws (D) to specification.

Specifications:

Ignition module air gap . . . . . 0.32 mm (0.013 in.)
Mounting cap screws. . . . . 5 N•m (44 lb-in.)

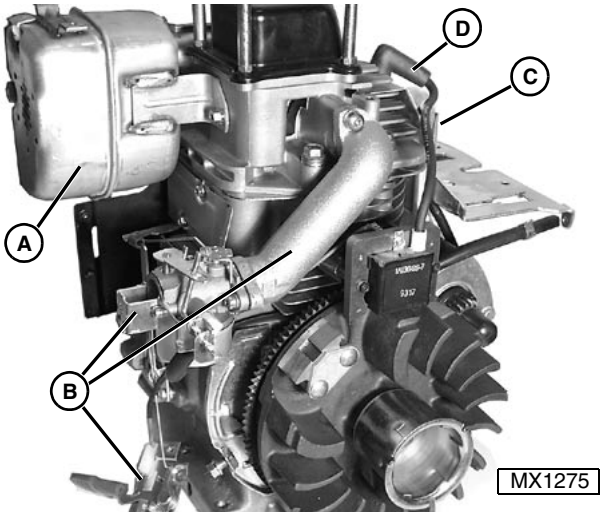
3. Finish installation in reverse order of removal - go to Step 2 then Step 1.

CYLINDER HEAD

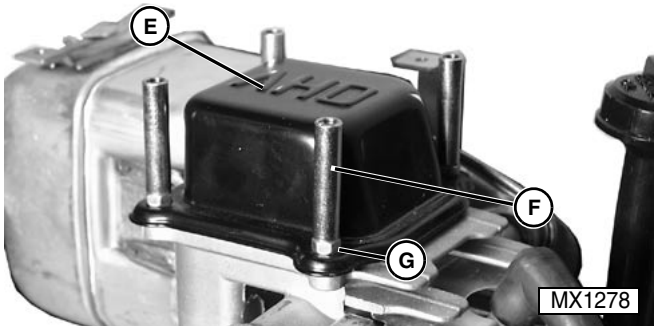
Removal:

IMPORTANT: Remove cylinder head when engine is cold to prevent cylinder head warpage.

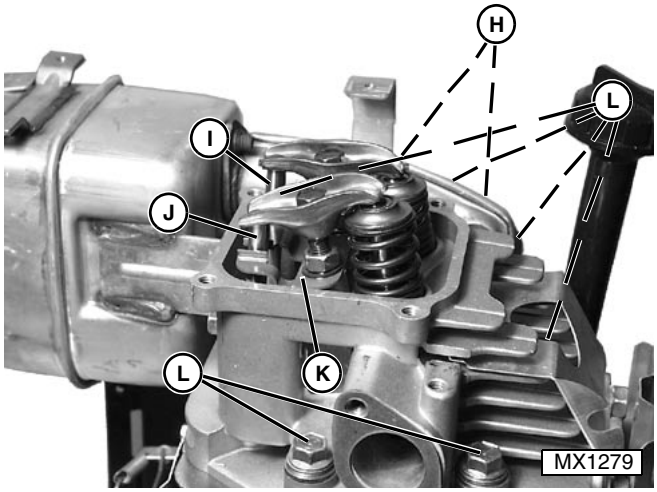
1. Remove engine and drain crankcase. Properly discard oil. (See “ENGINE” on page37.)



2. Remove muffler (A).
3. Carefully remove throttle control plate, carburetor and intake manifold (B)—DO NOT bend or damage throttle linkage—HANDLE WITH CARE.
4. Remove heat shield (C), and disconnect ignition module lead (D) from spark plug and remove spark plug.



5. Remove valve cover (E) threaded spacers (F), and studs (G).



6. Remove exhaust manifold cap screws (H) and remove exhaust manifold.
7. Remove intake valve rocker arm and its respective push rod (I), exhaust valve rocker arm and its respective push rod (J) and guide plate (K) (guide tabs must face up).

IMPORTANT: Keep intake rocker arm with its push rod as a matched set and exhaust valve rocker arm with its push rod as a matched set—DO NOT mix components.

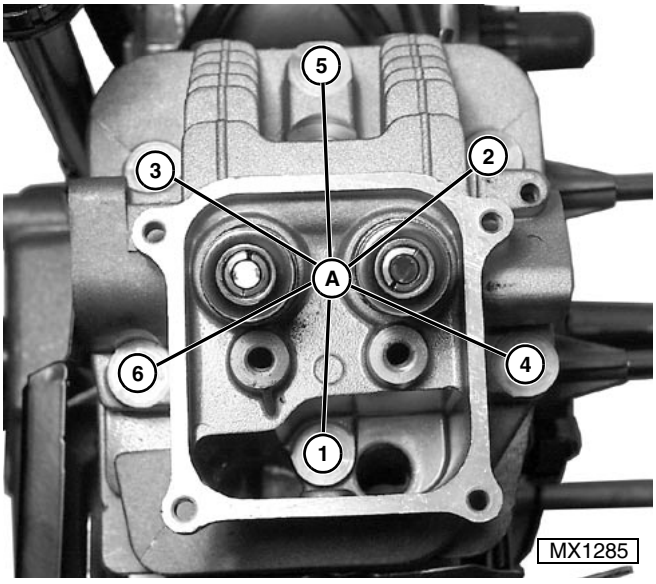
8. Remove six cylinder head cap screws (L).
9. Use a rubber hammer to tap cylinder head loose.

MX1280

10. Remove cylinder head and gasket, discard gasket.
11. DO NOT remove valves at this time.
12. Inspect cylinder head and remove any residue gasket material from mating surfaces of cylinder head and block.

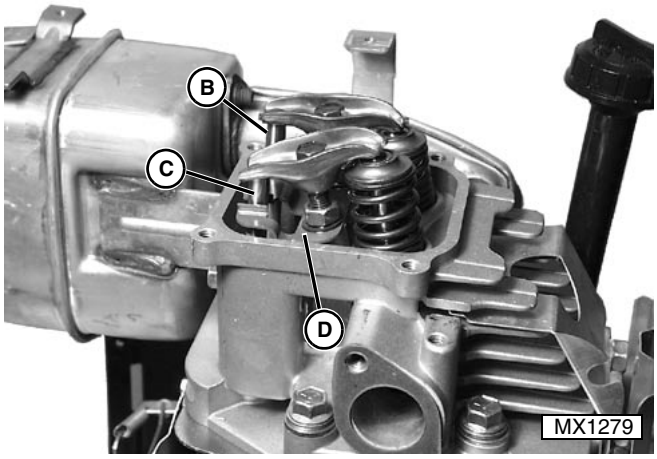
Installation:

1. Install in reverse order. Always install new head gasket. BE SURE to install and align push rods with their respective rocker arm sockets.



MX1285

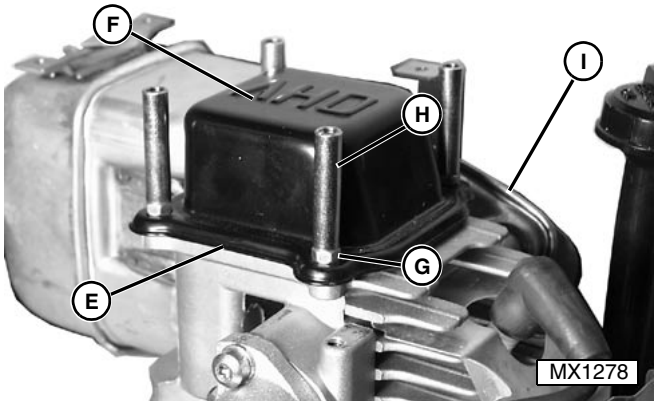
2. Install six cylinder head cap screws (A), in positions shown, with longest cap screw in position “2”.
3. Use numbered sequence in **6.8 N•m (60 lb-in.)** increments until final torque of **26 N•m (230 lb-in.)** is achieved.



MX1279

IMPORTANT: Keep intake rocker arm with its push rod as a matched set and keep exhaust valve rocker arm with its push rod as a matched set—DO NOT mix components

4. Coat intake (B) and exhaust (C) rocker arms and their respective push rods with film of clean engine oil and install with guide plate (D) (guide tabs must face up).
5. Adjust valve clearance. (See “VALVE-TO-ROCKER ARM CLEARANCE TEST” on page30.)



MX1278

6. Install new valve cover gasket (E), and original valve cover (F). Install long studs (G) with shorter shank into head. Tighten special studs to **6 N•m (55 lb-in.)**. Install threaded spacers (H).
7. Install exhaust manifold (I) to **18 N•m (160 lb-in.)**.
8. Install intake manifold and related components. (See“INTAKE MANIFOLD” on page40.)

CYLINDER HEAD INSPECTION

Equipment:

- Flat Feeler Gauge

Procedure:

1. Remove carbon deposits from combustion chamber and gasket surface using John Deere Emery Cloth (120 - fine grit) or equivalent.

2. Clean head with solvent.
3. Inspect for cracks or broken cooling fins.
4. Inspect gasket surface for residue, burrs and nicks.
5. Check several points around head surface for distortion. Replace head if distortion exceeds **0.05 mm (0.002 in.)**.

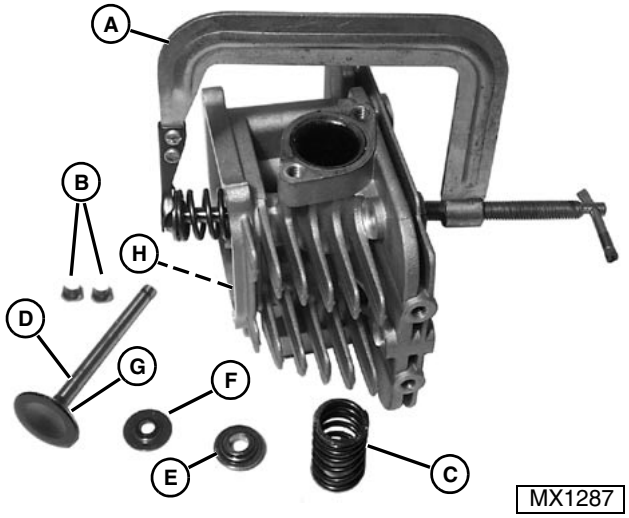
VALVE ASSEMBLY

Equipment:

- JDM70 Valve Spring Compressor

Removal:

1. Remove cylinder head. (See “CYLINDER HEAD” on page42.)



Exhaust Valve (Smaller Diameter) Removed

2. Use JDM70 Valve Spring Compressor (A) to remove valve spring retainers (B), springs (C), valves (D), sealing washer (E), and locking cap (F).

Installation:

1. Install valve assembly in reverse order of removal—be sure to coat valve stems (G) and valve guides (H) contact surfaces with film of clean engine oil before installation.
2. Compress valve spring. Hook locking cap in valve stem groove. Release tension on spring and make sure locking cap is properly seated in valve stem groove and spring is properly seated under cap.

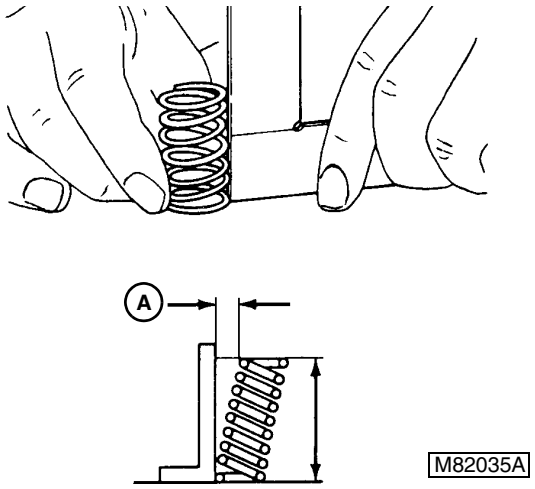
VALVE SPRING INSPECTION

Equipment:

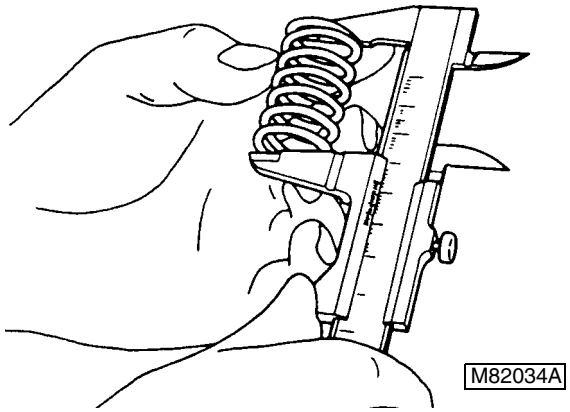
- Inside/Outside Calipers

Procedure:

1. Clean and inspect valve springs. Replace if cracked or broken.



2. Inspect valve spring for squareness on a surface plate. Turn spring and measure space (A) between top spring coil and square.



3. Measure free length of valve spring with calipers.
4. Compress valve spring. Measure compressed tension and length.

Replace valve spring if not within specifications.

Specifications:

Squareness Tolerance . . . . . 2.29 mm (0.090 in.)
Free Length . . . . . 50.29 mm (1.980 in.)
Compressed Length . . . . . 17.78 mm (0.700 in.)
Compressed Tension . . . . . 21.77 kg (48 lbs.)

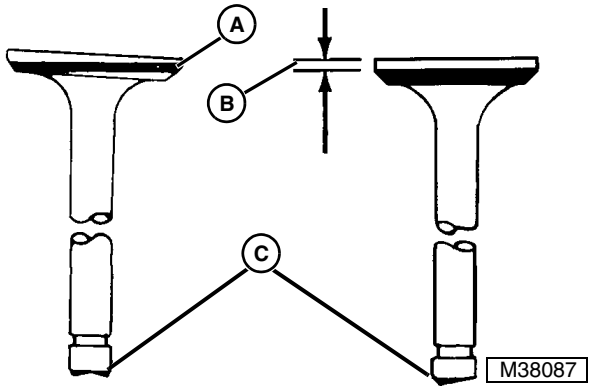
VALVE INSPECTION

Equipment:

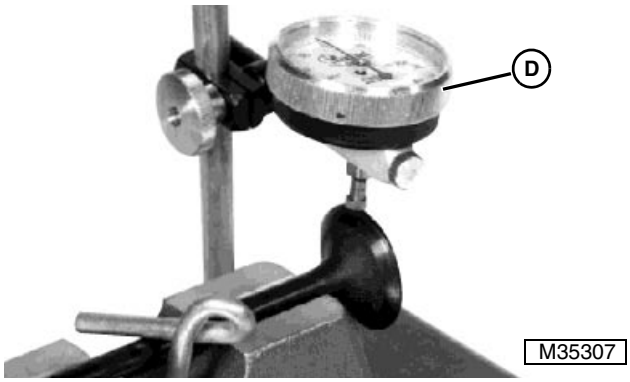
- Outside Micrometer
- Inside/Outside Calipers
- D05058ST Valve Inspection Center
- JDM15 Dial Indicator Kit

Procedure:

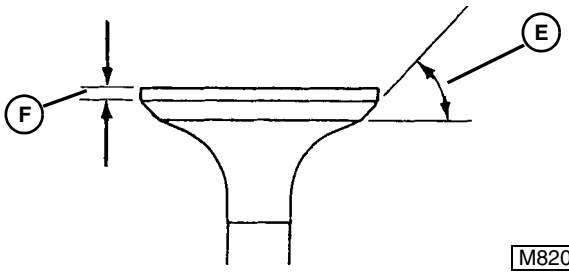
1. Remove carbon from valve head, face and stem with a power-operated wire brush. Be sure carbon is removed, not merely burnished.



2. Visually check valve for damage and use inside/outside calipers to measure valves for wear tolerances. If valve seat surface is worn, burned or pitted (A), grind valves to proper face angle. If valve face margin (B) is less than **0.79 mm (0.031 in.)** after grinding, replace valve.
3. Grind valve stem ends (C) square, if required.

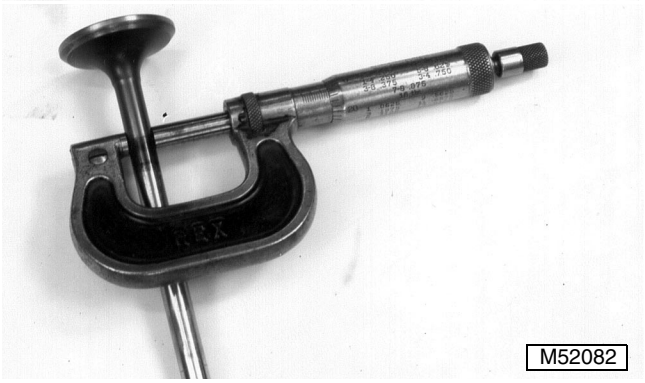


4. Check valves for out-of-round, bent or warped condition using D05058ST Valve Inspection Center (D). Turn valve slowly and read variation on JDM15 Dial Indicator. Replace valve if variation is greater than **0.03 mm (0.001 in.)**.



M82030A

5. If valve faces are worn, burned, or pitted; grind valves to proper face angle of 45° (E). If valve face margin (F) is less than **0.79 mm (0.031 in.)** after grinding, replace valve.



M52082

6. Measure outside diameter of valve stem. Replace valve and guide if worn **0.794 mm (0.031 in.)** or greater under standard valve guide specification.

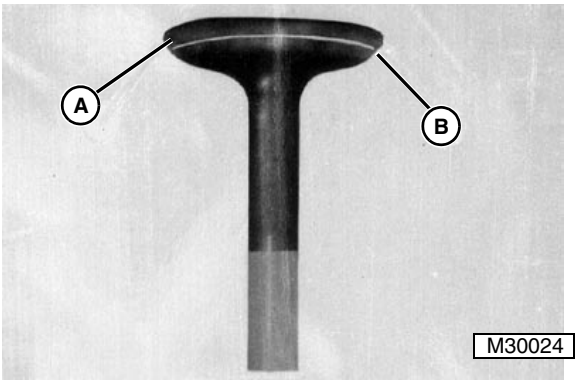
VALVE ANALYSIS

M29934

- Carbon deposits on the intake valve are caused by exhaust gas leakage past the valve, when using leaded gasoline.
- Grind intake valve and re-face seat to correct this condition.
- Use unleaded fuel to prevent carbon deposits.

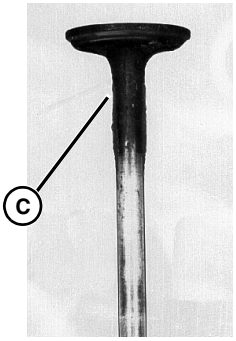
M5563

- Valve stem corrosion is caused by moisture in the engine which occurs during hot engine cool-down periods during storage.
- Fogging combustion chamber with oil before storage helps prevent corrosion.
- Replace badly corroded valves.



M30024

- Operating at high temperatures for long periods of time can cause exhaust valve burning. Burned valve will show dark discoloration into the area protected by the valve guide. Another indication is distortion of the margin (A) and face (B). The valve seat may also show erosion.
- An overheated engine can cause valve burning. Check for clogged engine cooling fins. Do not run engine with blower housing removed. Also check for worn valve guides, springs or tappets, lean fuel-air mixture or incorrect spark plug.



M29936

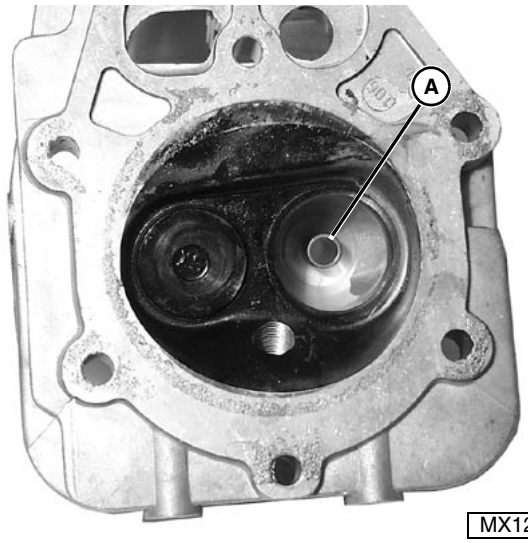
- Use of old or stale gasoline can cause valves to stick.
- Gummy deposits (C) build up on valve and can require cleaning.
- Always use fresh gasoline and drain fuel tank, lines and carburetor before storage.

VALVE GUIDE INSPECTION

Equipment:

- JDG332 Telescoping Gauge Set

Procedure:



MX1288

1. Clean inside of valve guide (A).
2. Measure inside diameter of guide with telescoping gauge. Ream guide if not within specifications.

IMPORTANT: If guide is reamed oversize, an new valve and guide must be installed.

Valve guide specifications (All models):

Standard
. . . . . 7.87 - 7.95 mm (0.310 - 0.313 in.)
Oversize
. . . . . 8.72 - 8.74 mm (0.343 - 0.344 in.)
Wear Tolerance
. . . . . 0.03 - 0.05 mm (0.001 - 0.002 in.)

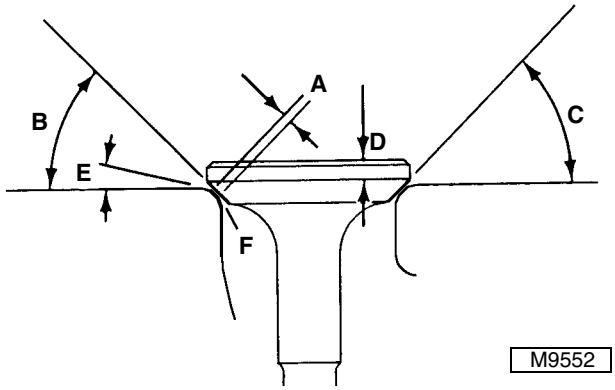
3. Replace head if guides cannot be reamed to specifications.

VALVE SEAT RECONDITIONING

Equipment:

- JDM52A Valve Seat Service Set

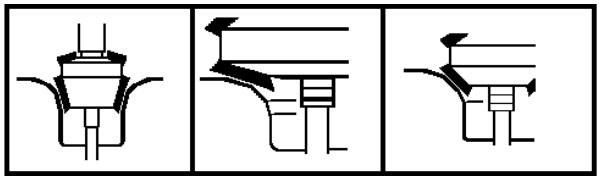
Procedure:



M9552

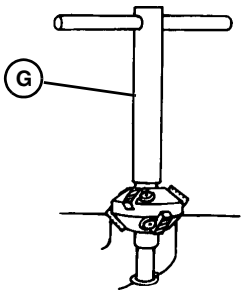
A. Valve Seating Surface 1.19 mm (0.047 in.) - Minimum	**B. Valve Seat Angle (46°)**
C. Valve Face Angle (45°)	**D. Valve Margin 0.79 mm (0.031 in.) minimum**
E. Valve Seat Top Narrowing Angle (31°)	**F. Valve Seat Bottom Narrowing Angle (60°)**

1. The valve seat angle (B) depends on valve face angle (C). New valves have a 45° face. Recondition valve seats with 46° cutter, to maintain, as close as possible, a **1.19 mm (0.047 in.) seating surface (A).**



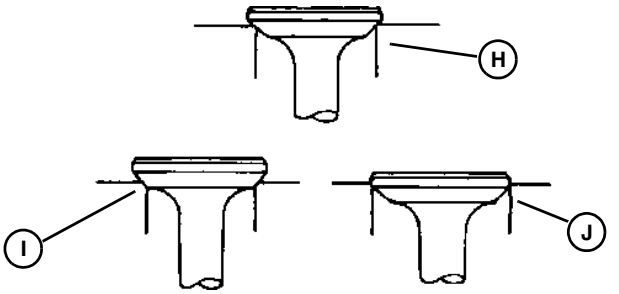
Bottom Narrow 60° Cutter | **Top Narrow 31° Cutter** | **Seat Face 46° Cutter**

M96302



M25952

2. On seats with more than **0.79 mm (0.031 in.)** seating surface, cut back seating surface by grinding top narrow with 31° cutter (G). DO NOT cut back seating surface if less than **0.79 mm (0.031 in.)** — replace cylinder head or block.



M25953

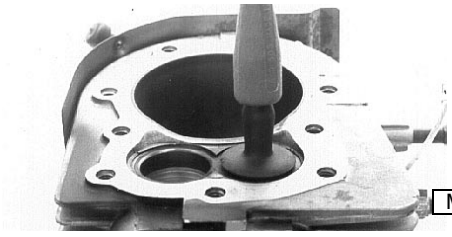
3. Match valve to seat. Be sure valve is centered (H) on valve face, and not too shallow (I) or too deep (J). Always lap valves to seats after any re-facing. (See below.)

VALVE LAPPING

Equipment:

- JDM54 or JDM55 Valve Lapper

Procedure:



M53763

1. Apply a small amount of lapping compound to valve face.
2. Turn valve in seat using valve lapper.
3. Check valve every eight strokes until a uniform ring appears around surface of valve face.
4. Wash parts in solvent to remove lapping compound.
5. Check position of lap mark on face. Lap mark must be on or near center of valve face.

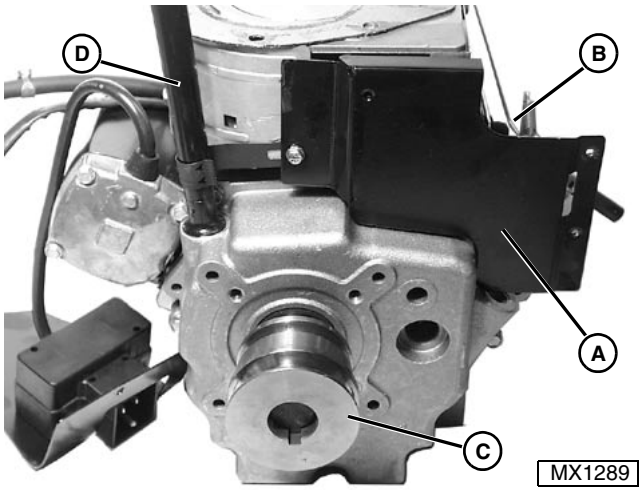
CRANKCASE COVER

Equipment:

- Ellen wrench
- JDG332 Telescoping Gauge Set

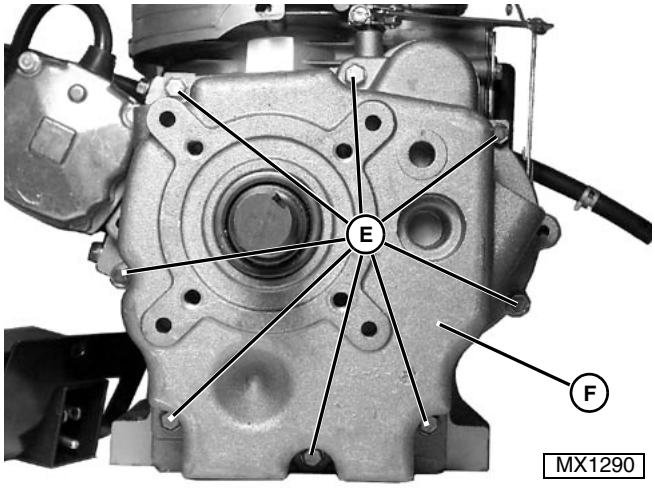
Removal:

1. Remove engine and drain crankcase. Properly discard oil. (See “ENGINE” on pag e37.)



MX1289

2. Remove carburetor cover (A) and carburetor.
3. Remove governor lever (B).
4. Loosen two torx set screws, and remove drive pulley (C).
5. Remove oil dipstick tube (D).



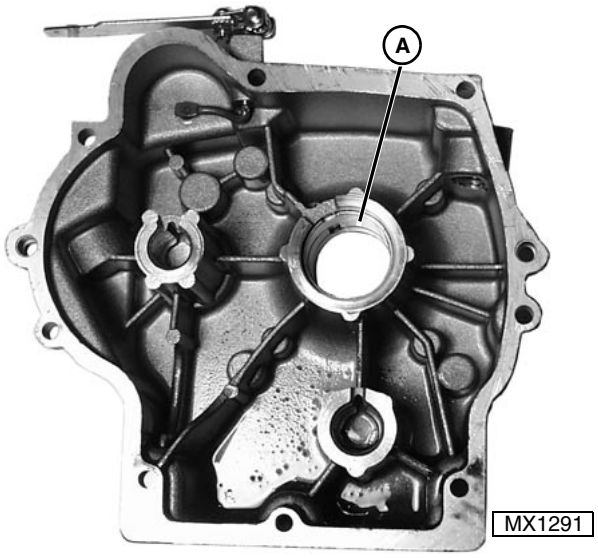
MX1290

1332DDE Model shown (other models similar)

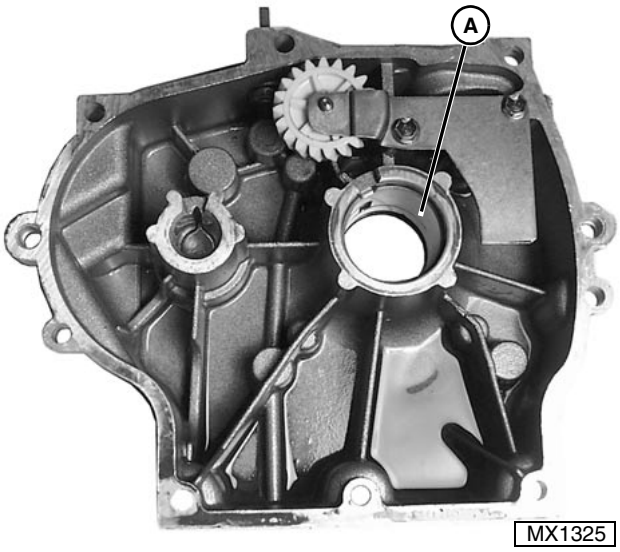
6. Remove eight cap screws (E), crankcase cover (F) and gasket.
7. Clean gasket surfaces of crankcase and crankcase cover.

Inspection:

1. Thoroughly clean both sides of cover, and inspect for cracks or damage. Replace as necessary.



1332DDE



924DE, 1128DE, and 1128DDE

2. Inspect crankshaft bearings (A).
3. Using the JDG332 Telescoping Gauge Set, measure the inside diameter of the Camshaft and Crankshaft bearing journals. Replace cover if greater than specification.

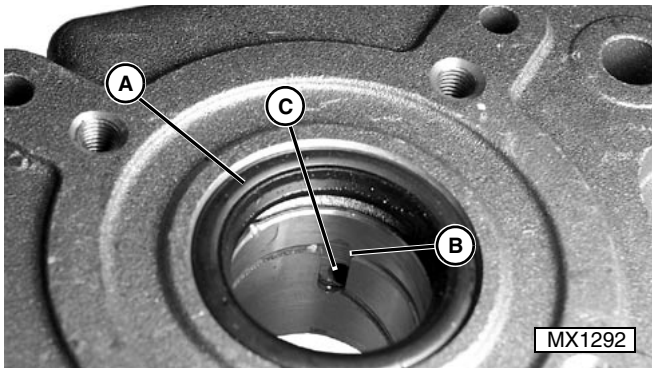
Specifications:

Camshaft Bearing Journal
. . . . . 15.82 - 15.84 mm (0.6230 - 0.6235 in.)
Crankshaft Bearing
. . . . . 34.963 - 34.976 mm (1.3765 - 1.3770 in.)

4. If cover is not damaged, remove seal from inside-out, discard seal, and install new seal from outside-in using JDG489 seal installer until flush with cover surface.

Bushing Replacement:

1. Remove crankshaft seal from inside-out from crankcase cover.



2. Press bushing (A) from crankcase cover using appropriate size driver.
3. Align oil slot (B) in bushing with oil hole (C) in bore.
4. Stake bushing (A) as shown.
5. Measure bushing diameter to specifications, replace as necessary.

Specifications:

Bushing ID
All Models . . . . . 34.963 - 34.976 mm
. . . . . (1.3765 - 1.3770 in.)

6. Install new crankshaft seal from outside-in using engine manufacturers appropriate size seal driver until flush with cover surface.

Installation:

1. Install new gasket.
2. Turn crankshaft to line up governor when installing cover.
3. Align two locating pins as cover is installed.
4. Install crankcase cover. Tighten cap screws in crossing pattern to specification.

Specifications:

Crankcase Cap Screws . . . . . 14 N•m (125 lb-in.)

5. Install dipstick tube.
6. Install pulley.
7. Install and adjust governor lever.
8. Install carburetor cover.
9. Fill crankcase with oil to specification.

Specifications:

924DE, 1128DE, and 1128DDE . . . 0.77L (26 U.S. oz)
1332DDE . . . . . 0.95L (32 U.S. oz)

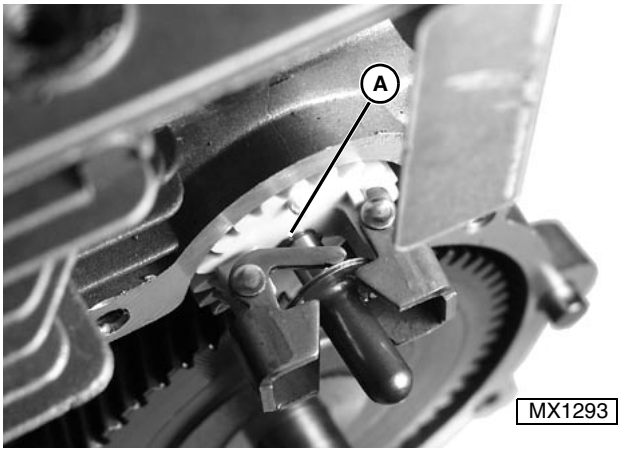
10. Install remaining components in reverse order of removal. (See appropriate procedures earlier in this section.)

GOVERNOR

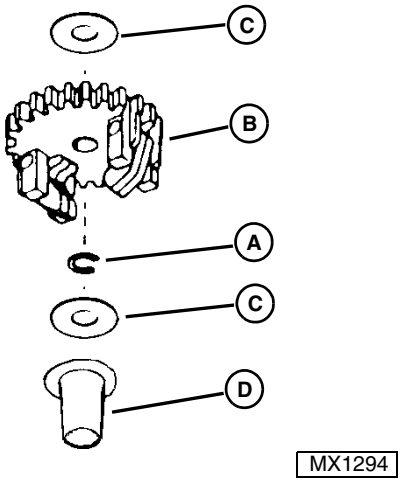
Removal:

1332DDE—

1. Remove engine and drain crankcase. Properly discard oil. (See “ENGINE” on page37.)
2. Remove crankcase cover. (See “CRANKCASE COVER” on page48.)



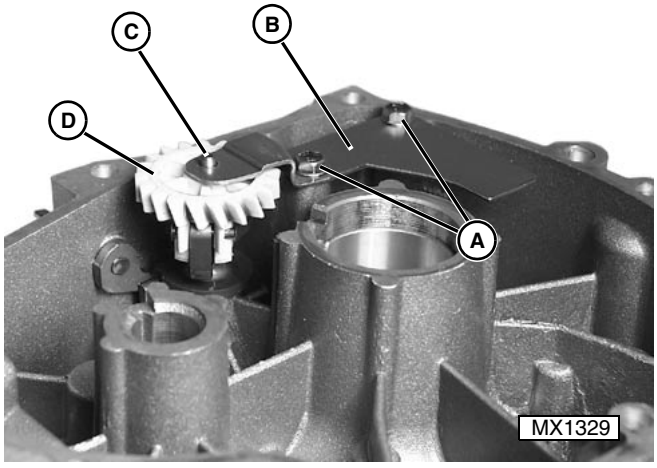
3. Remove retaining ring (A) to remove retainer.



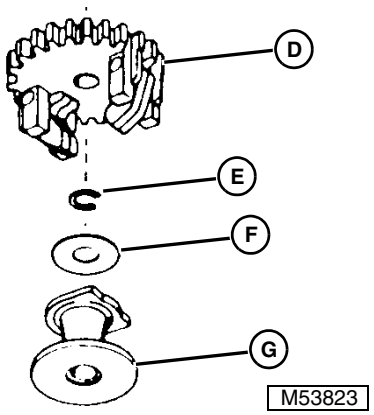
4. Remove governor gear assembly (B).
5. Remove washers (C).
6. Remove spool (D).
7. Inspect components. Weights must move freely. Replace damaged parts.

924DE, 1128DE, and 1128DDE—

1. Remove engine and drain crankcase. Properly discard oil. (See “ENGINE” on pag e37.)
2. Remove crankcase cover. (See “CRANKCASE COVER” on page48.)



3. Remove two retainer screws (A) and retainer (B) off of governor shaft (C).
4. Remove governor gear assembly (D).

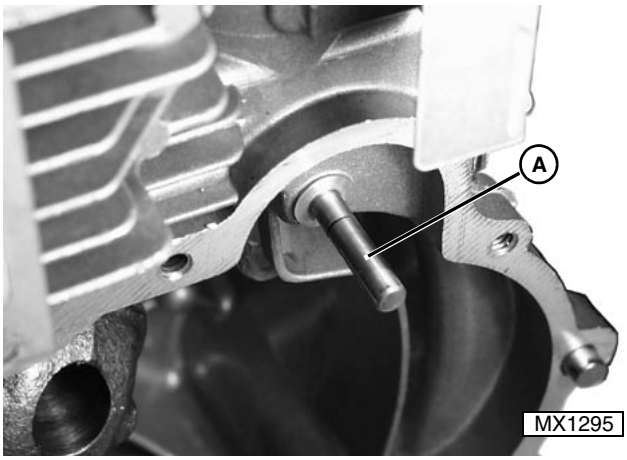


5. Remove retaining ring (E), washer (F), and spool (G).
6. Inspect components. Weights must move freely. Replace damaged parts.

Shaft Removal:

1332DDE—

1. Remove governor assembly. (See “GOVERNOR” on page50.)

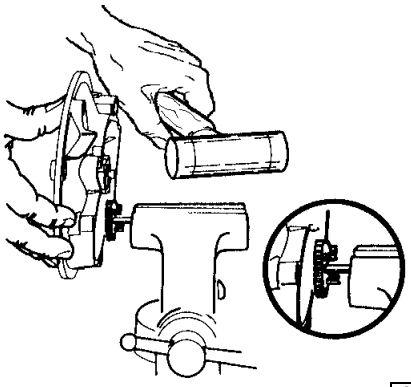


2. Remove governor shaft (A) by clamping governor shaft in a locking pliers and gently pulling shaft out of housing.

NOTE: Do not twist the shaft when removing. The shaft may become enlarged, and the press fit will not secure the new governor shaft.

924DE, 1128DE, and 1128DDE—

1. Remove governor assembly. (See “GOVERNOR” on page50.)

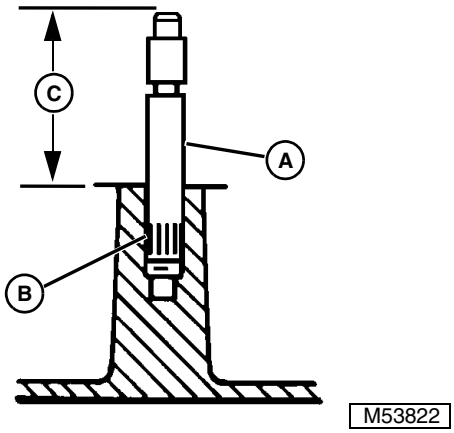


2. Remove governor shaft by clamping governor shaft in a vise and gently strike crankcase cover flange with a plastic hammer to remove shaft.

NOTE: Do not twist the shaft when removing. The shaft may become enlarged, and the press fit will not secure the new governor shaft.

Shaft Installation:

All Models—



1. Apply John Deere Thread Lock and Sealer (medium strength) to end of governor shaft (A).
2. Set governor shaft (A) in shaft bore (B). Strike lightly with a soft hammer to start shaft into bore.

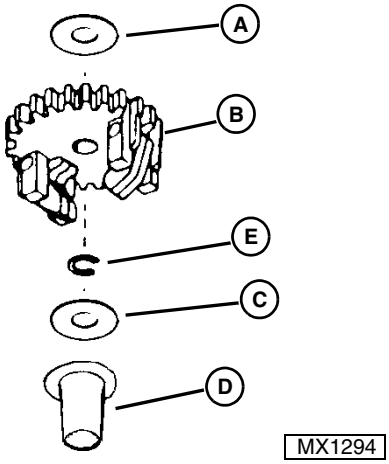
3. Put crankcase cover (924DE, 1128DE, and 1128DDE) in a press or hold engine housing in place (1332DDE) with solid support under governor shaft bore area.
4. Press shaft into bore until exposed shaft dimension meets specification (C).

Specification:

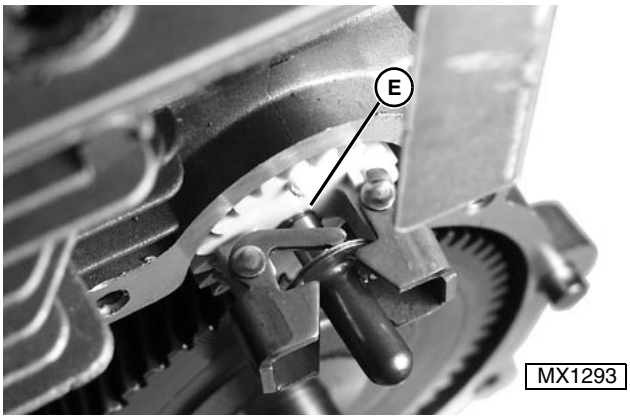
All Models . . . . . 27.56 - 27.94 mm (1.085 - 1.100 in.)

Installation:

1332DDE—

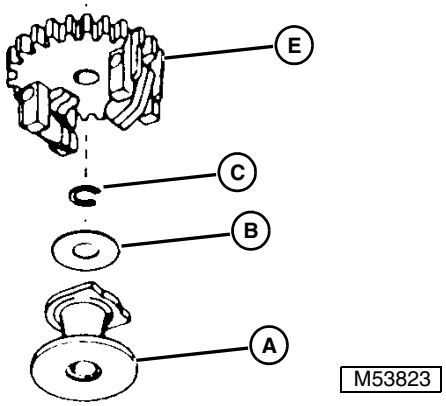


1. Install washer (A) and governor gear assembly (B).
2. Install washer (C) and spool (D) on governor shaft.

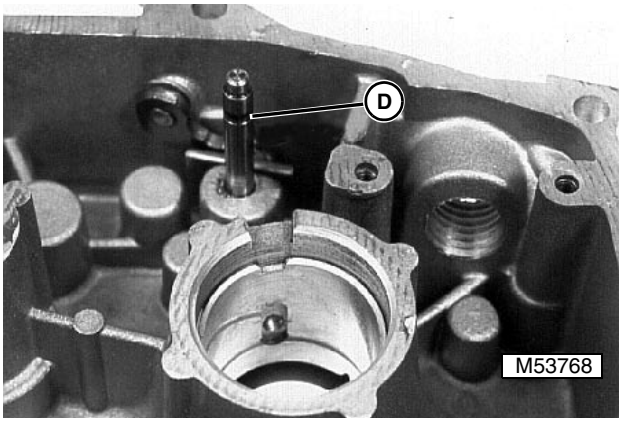


3. Install retaining ring (E) in retaining ring groove.
4. Check for proper function by spinning gear. With camshaft removed, governor gear assembly should turn freely on governor shaft and spool should move outward freely as fly weights are forced outward from shaft and fingers push outward on round flange of spool.
5. Install crankcase cover. (See “CRANKCASE COVER” on page48.)

924DE, 1128DE, and 1128DDE—

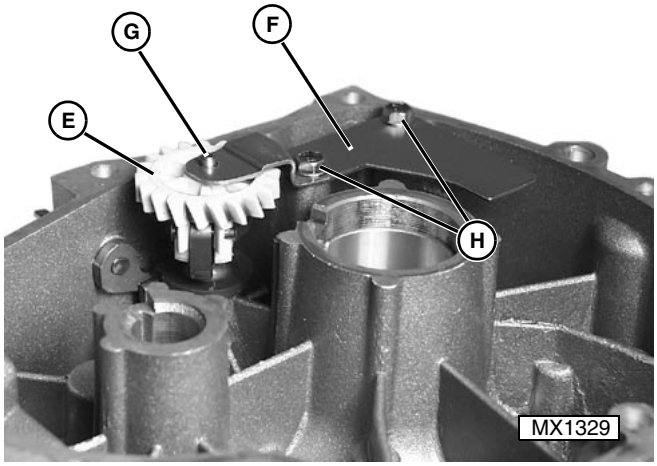


1. Install spool (A) and washer (B).



Spool and washer removed for clarity

2. Install retaining ring (C) in retaining ring groove (D). Install governor gear assembly (E) on governor shaft.

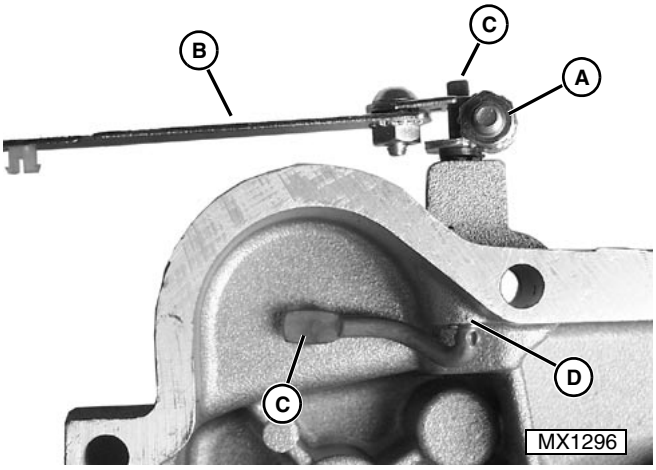


3. Install retainer (F) onto governor shaft (G). Fasten retainer with two screws (H).
4. Stand crankcase cover upright and check for proper function by spinning gear–governor gear assembly should turn freely on governor shaft and spool should move outward freely as fly weights are forced outward from shaft and fingers push outward on round flange of spool.
5. Install crankcase cover. (See “CRANKCASE COVER” on page48.)

Lever Removal:

1332DDE—

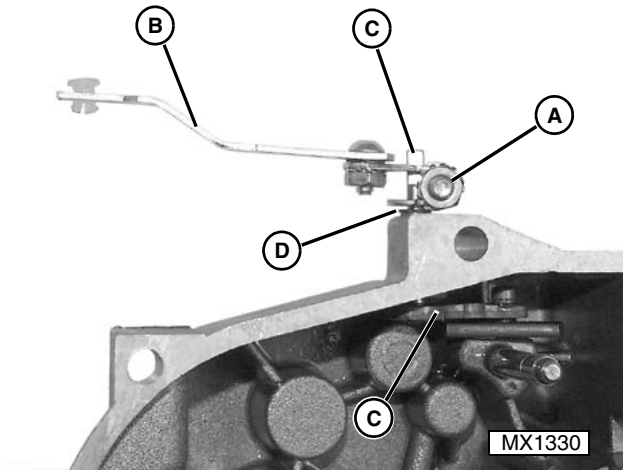
1. Remove crankcase cover.
2. Remove camshaft. (See “CAMSHAFT AND FOLLOWERS” on p a g e54.)



3. Loosen clamp (A) to remove governor arm (B) from governor lever (C).
4. Remove governor lever (C) and washer (D).
5. Inspect lever and block bore for damage. Replace lever or block as necessary.

924DE, 1128DE, and 1128DDE—

1. Remove crankcase cover. (See “CRANKCASE COVER” on page48.)
2. Remove governor. (See “GOVERNOR” on page 50.)



3. Loosen clamp (A) to remove governor arm (B) from governor lever (C).
4. Remove retaining ring and washer (D) and governor lever (C).
5. Inspect lever and block bore for damage. Replace lever or block as necessary.

Installation:

1332DDE—

1. Installation is done in reverse order of removal.
2. Install cap screw in governor arm clamp. DO NOT tighten until governor is properly adjusted.
3. Install camshaft and crankcase cover. (See appropriate procedures in this section.)
4. Adjust governor. (See “GOVERNOR ADJUSTMENT (STATIC)” on page26.)

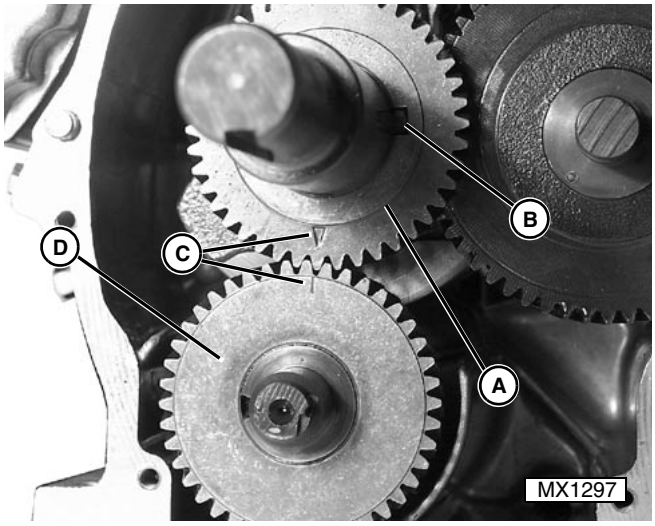
924DE, 1128DE, and 1128DDE—

1. Installation is done in reverse order of removal.
2. Install cap screw in governor arm clamp. DO NOT tighten until governor is properly adjusted.
3. Install governor. (See “GOVERNOR” on page50.)
4. Adjust governor. (See “GOVERNOR ADJUSTMENT (STATIC)” on page26.)

COUNTERBALANCE SHAFT—1332DDE

Removal and Installation:

1. Remove crankcase cover. (See “CRANKCASE COVER” on page48.)



2. Remove drive gear assembly (A) and key (B) (be careful to note aligning marks (C) before removal).
3. Remove counterbalance shaft (D).

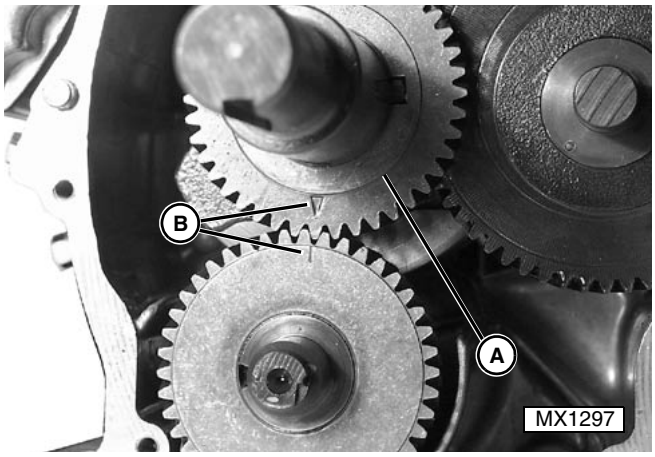
4. Inspect counterbalance shaft for damage or wear, and replace, if necessary.
5. Installation is done in reverse order of removal (make sure to align timing marks before completely installing shaft and gear assembly).

CAMSHAFT AND FOLLOWERS

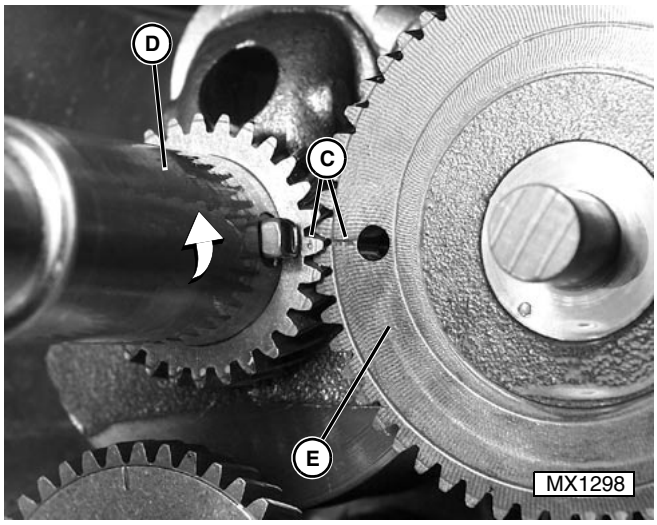
Removal:

1332DDE—

1. Remove crankcase cover. (See “CRANKCASE COVER” on page48.)

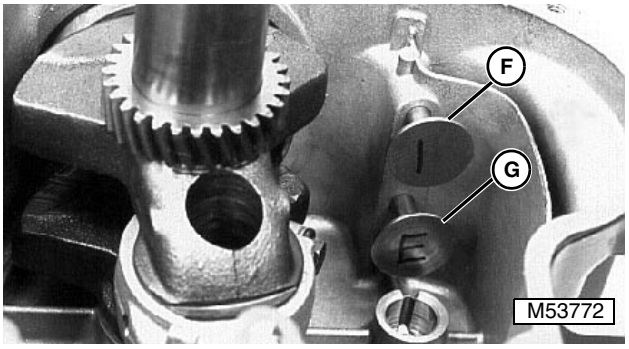


2. Remove drive gear assembly (A) (be careful to note aligning marks (B) before removal).



3. Align timing marks (C).
4. Rotate crankshaft (D) counterclockwise three teeth past alignment position to allow compression release to clear exhaust valve follower.
5. Remove camshaft (E).

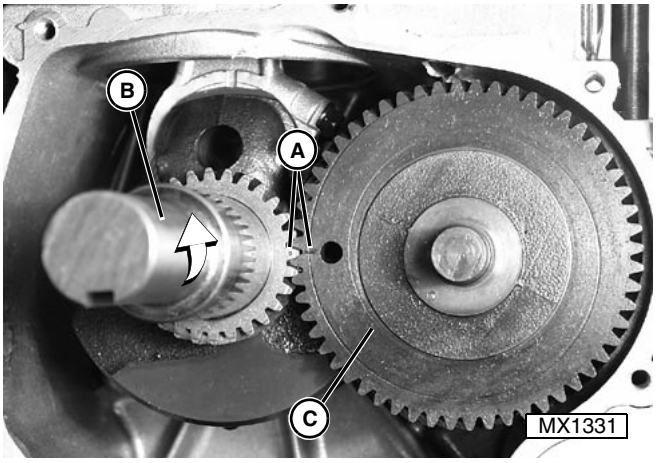
IMPORTANT: Mark followers for installation in same bore. Incorrect installation can cause camshaft or follower damage.



6. Remove intake follower (F) and exhaust follower (G).
7. Inspect followers for wear or damage.

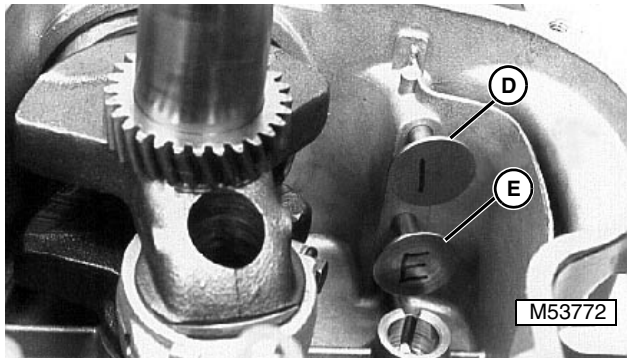
924DE, 1128DE, and 1128DDE—

1. Remove crankcase cover. (See “CRANKCASE COVER” on page48.)



2. Align timing marks (A).
3. Rotate crankshaft (B) counterclockwise three teeth past alignment position to allow compression release to clear exhaust valve follower.
4. Remove camshaft (C).

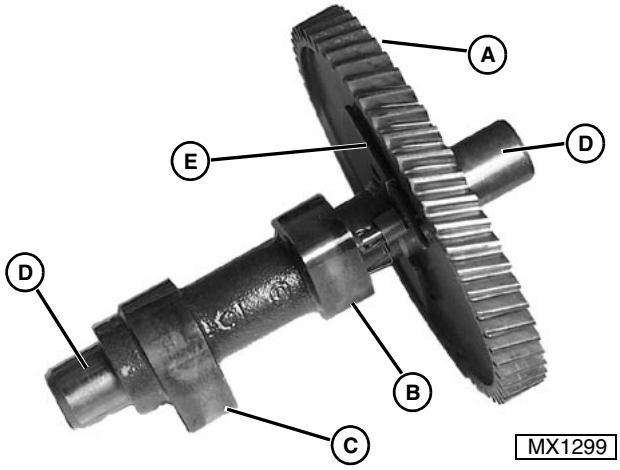
IMPORTANT: Mark followers for installation in same bore. Incorrect installation can cause camshaft or follower damage.



5. Remove intake follower (D) and exhaust follower (E).
6. Inspect followers for wear or damage.

Camshaft Inspection:

All Models—



1. Inspect gear (A) for chipped, cracked or worn teeth.
2. Inspect intake lobe (B) and exhaust lobe (C) for wear or damage. Severely worn lobes may indicate valve train problems. Check valve train components. (See “VALVE ASSEMBLY” on page 44.)
3. Inspect bearing surfaces (D) for cracks. Replace if bearing surfaces are less than specification.

Specification:

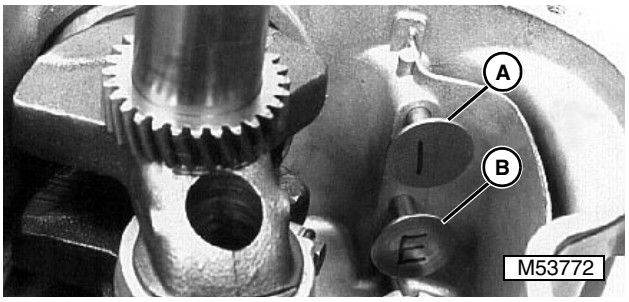
Camshaft Bearing Diameters
. . . . . 15.82 - 15.84 mm (0.6230 - 0.6235 in.)

NOTE: Camshaft and crankshaft gears wear as a pair. If camshaft is replaced, crankshaft must be replaced also.

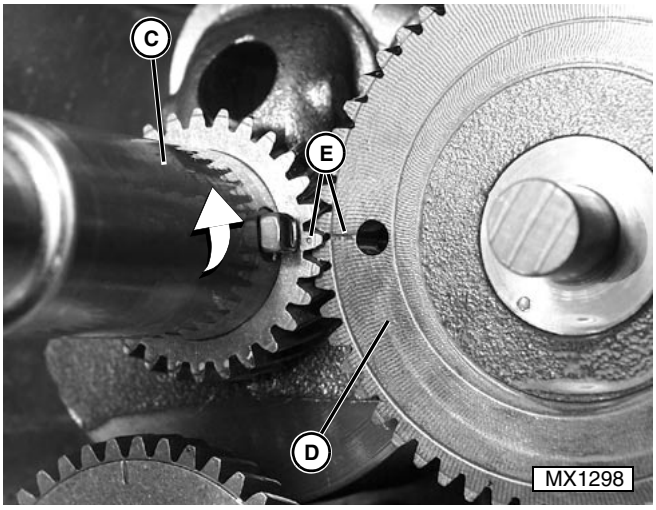
4. Inspect ACR mechanism (E) for damage. ACR must move freely. Replace if defective.
5. If worn or damaged, replace camshaft and crankshaft as a pair. (See appropriate procedures in this section.)

Installation:

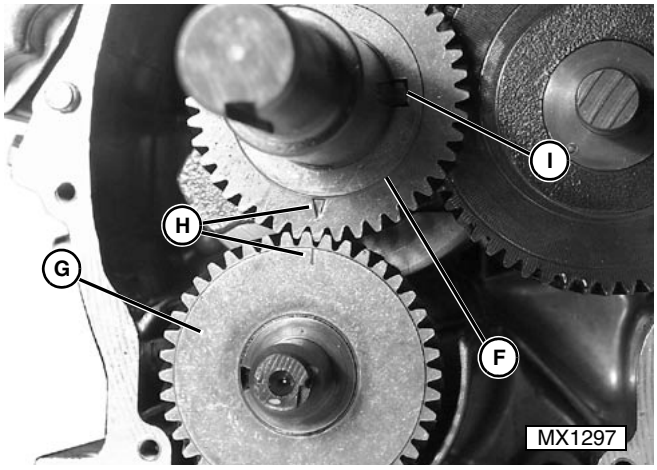
1332DDE—



1. Install intake follower (A) and exhaust follower (B) in correct bores.



2. Turn crankshaft (C) counterclockwise three teeth past aligned position.
3. Install camshaft (D) so timing marks (E) will be aligned when crankshaft is rotated to the right—this allows proper positioning of ACR mechanism with exhaust follower.
4. Rotate crankshaft clockwise to check that timing marks align. If timing marks DO NOT align, repeat procedure until they do align.

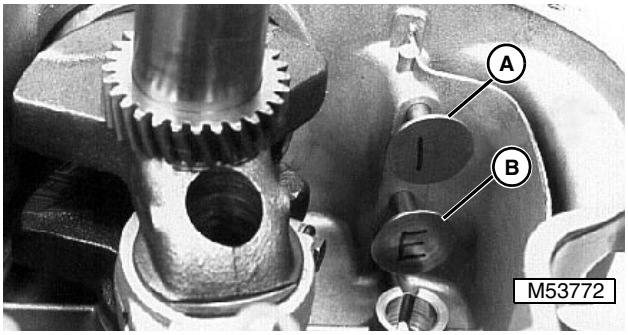


5. Install drive gear assembly (F) and counterbalance shaft (G) (be careful to note aligning marks (H) and insert key (I) before completing assembly).
6. Install crankcase cover. (See “CRANKCASE COVER” on page48.)
7. Install engine and fill with specified engine oil.

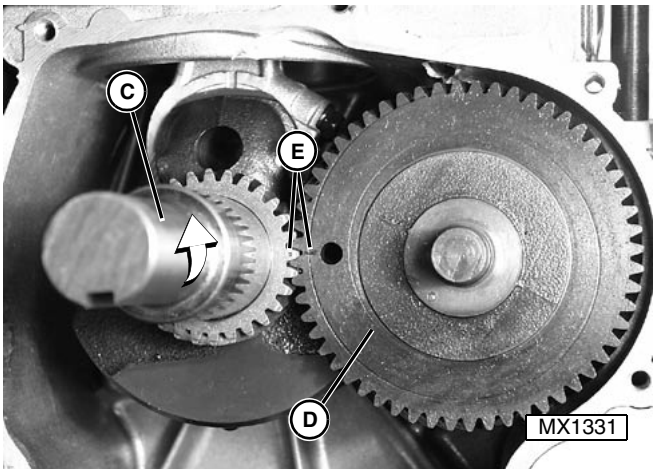
Specification:

1332DDE . . . . . .0.95L (32 U.S. oz)

924DE, 1128DE, and 1128DDE—



1. Install intake follower (A) and exhaust follower (B) in correct bores.



2. Turn crankshaft (C) counterclockwise three teeth past aligned position.
3. Install camshaft (D) so timing marks (E) will be aligned when crankshaft is rotated clockwise—this allows proper positioning of ACR mechanism with exhaust follower.
4. Rotate crankshaft clockwise to check that timing marks align. If timing marks DO NOT align, repeat procedure until they do align.
5. Install crankcase cover. (See “CRANKCASE COVER” on page48.)
6. Install engine and fill with specified engine oil.

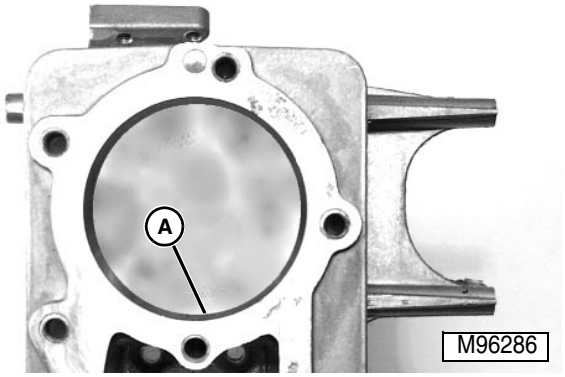
Specification:

924DE, 1128DE, and 1128DDE . . .0.77L (26 U.S. oz)

PISTON ASSEMBLY

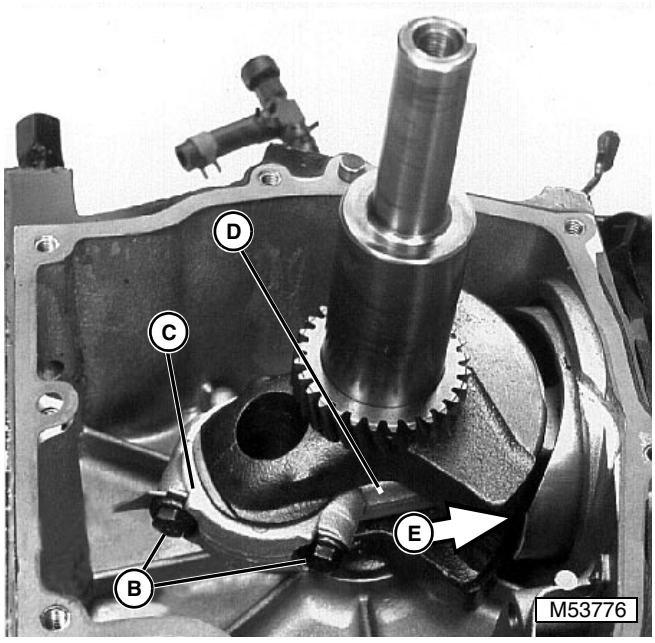
Removal:

1. Drain crankcase and remove engine. Properly discard oil.
2. Remove all external engine components including cylinder head, crankcase cover, camshaft and followers. (See procedures earlier in this section.)



IMPORTANT: Use ridge reamer to remove any carbon ridge (A) from top of cylinder bore. Carbon ridge can damage piston and piston rings.

3. Remove any carbon ridge (A) before removing piston assembly. Blow out and wipe clean any carbon residue.



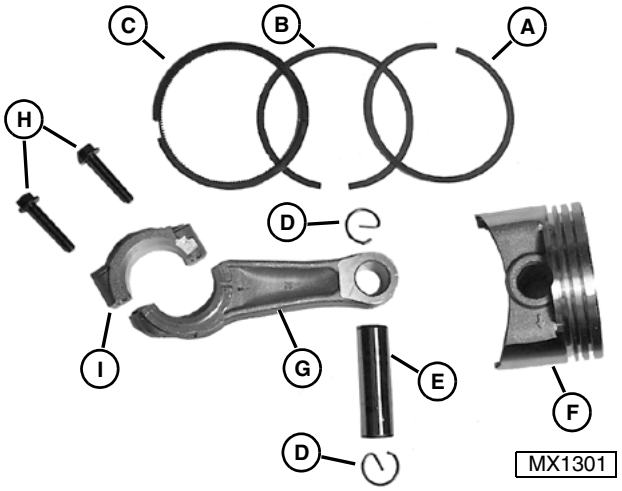
1128DE Model shown (other models similar)

IMPORTANT: Note orientation of components in relation to each other so installation will be done correctly. Remove piston assembly carefully so connecting rod does not damage crankshaft journal or cylinder wall.

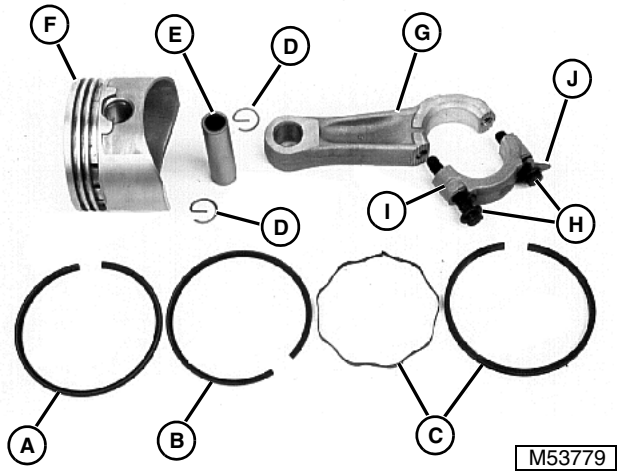
4. Remove cap screws (B), and connecting rod cap (C).
5. Carefully remove connecting rod (D) and piston assembly through top of cylinder bore (E).

PISTON ASSEMBLY/DISASSEMBLY AND VISUAL INSPECTION

IMPORTANT: Note orientation of components in relation to each other to aid with installation.



1332DDE Model



924DE, 1128DE, and 1128DDE Models

1. Carefully remove TOP (A) and BOTTOM (B) compression rings and oil/expander rings (C) using ring expander.

IMPORTANT: DO NOT expand piston rings too far or they will break.

2. Carefully remove retaining clips (D) to remove wrist pin (E) and piston (F) from connecting rod (G)—use wooden dowel to push wrist pin out.
3. Visually inspect special cap screws (H), connecting rod cap (I), oil dipper (J) (924DE, 1128DE, and 1128DDE models only) and all other individual components for wear or damage. (See precise inspection of individual components on following pages.)

PISTON CLEANING

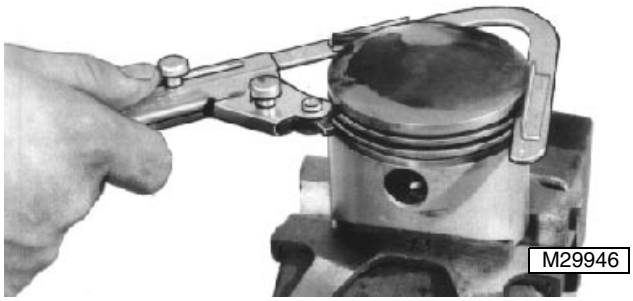
Equipment:

- JDG438 Ring Groove Cleaner

Procedure:

IMPORTANT: DO NOT use caustic cleaners or wire brush to clean aluminum piston. Piston damage can result.

1. Clean piston. Inspect for scoring or fractures.

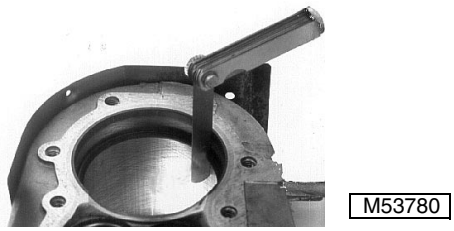


2. Clean carbon from ring grooves using JDG438 Ring Groove Cleaner tool.

PISTON RING END GAP MEASUREMENT

NOTE: First determine if cylinder block bore is within specification, then measure piston ring end gaps if cylinder block is usable or has been replaced. (See "CYLINDER BLOCK" on page 62.)

1. Use piston to push ring squarely in bore to a depth where ring is normally running.



IMPORTANT: If new rings are installed, first deglaze cylinder of engines so rings will seat properly. (See "CYLINDER BLOCK" on pag e62.)

2. Measure piston ring end gap.

Specification:

Piston Ring End Gap
. . . . . 0.254 - 0.508 mm (0.010 - 0.020 in.)

3. Remove ring and file ends squarely until gap meets specification—rings with too large a gap must be replaced.

PISTON RING SIDE CLEARANCE MEASUREMENT

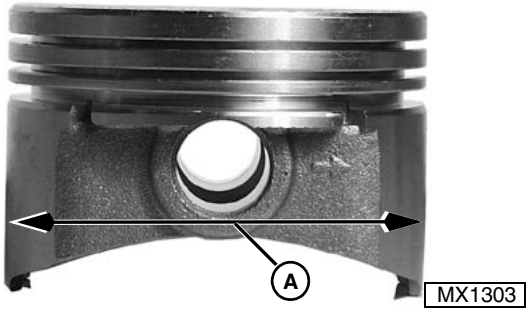

MX1302

1. Measure piston ring side clearance as shown at several points around piston.
2. Replace piston if measurements exceed clearance specifications.

Specifications (All Models):

Compression Rings (TOP and BOTTOM)
. . . . . 0.051 - 0.127 mm (0.002 - 0.004 in.)
Oil Control Ring
. . . . . 0.025 - 0.076 mm (0.001 - 0.003 in.)

PISTON MEASUREMENT



MX1303

1. Measure diameter (A) of piston **6.35 mm (0.25 in.)** from bottom of piston skirt and perpendicular **(180°)** to piston pin.
2. Measure cylinder bore. (See “CYLINDER BLOCK” on page62.)
3. Subtract piston skirt measurement from cylinder bore measurement to determine piston-to-cylinder bore clearance.
4. Replace piston and/or rebore cylinder block if not within specifications.

Specifications:

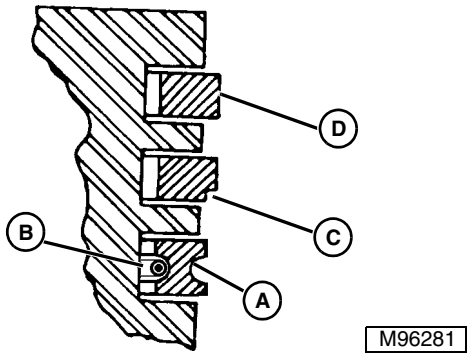
Piston Diameter
924DE, 1128DE, and 1128DDE . . . 79.24 - 79.26 mm
. . . . . (3.1195 - 3.1205 in.)
1332DDE . . . . . 84.06 - 84.09 mm (3.31 - 3.311 in.)
Piston-to-Cylinder Bore Clearance
All Models . . . 0.038 - 0.089 mm (0.0015 - 0.0035 in.)

PISTON RINGS INSTALLATION

Equipment:

- Piston Ring Expander Tool

Procedure:



M96281

Typical model shown (models may vary)

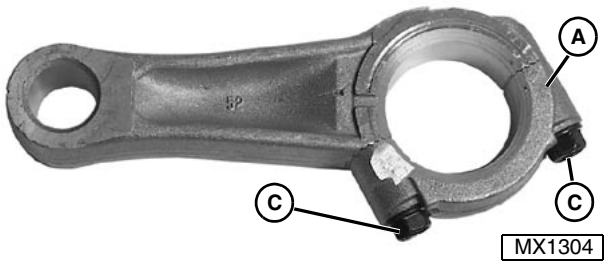
IMPORTANT: DO NOT expand piston rings too far or they will break. Install piston rings from top of piston.

1. Carefully install oil ring (A) with expander (B) in bottom piston groove using engine manufacturer’s piston ring expander tool.
2. Carefully install bottom compression ring with notch down (C) using engine manufacturer’s piston ring expander tool. (If equipped with an inside bevel, make sure the bevel surface is face up.)
3. Carefully install top compression ring (D) using engine manufacturer’s piston ring expander tool.
4. Stagger end gaps of rings to avoid compression loss during engine operation.

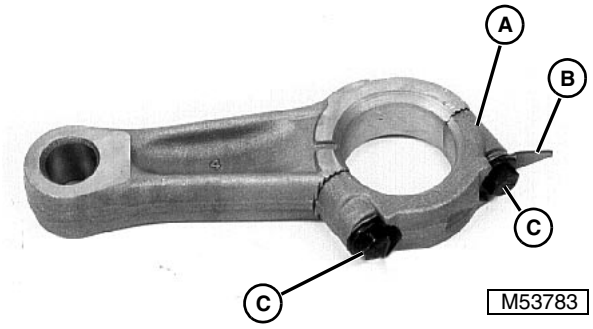
CONNECTING ROD INSPECTION AND MEASUREMENT

Procedure:

1. Clean connecting rod thoroughly and check for cracks or damage.



1332DDE Model



924DE, 1128DE, and 1128DDE Models

2. Install connecting rod cap (A). Install oil dipper (B) (924DE, 1128DE, and 1128DDE models only). Tighten cap screws (C) to specification.

Specification:

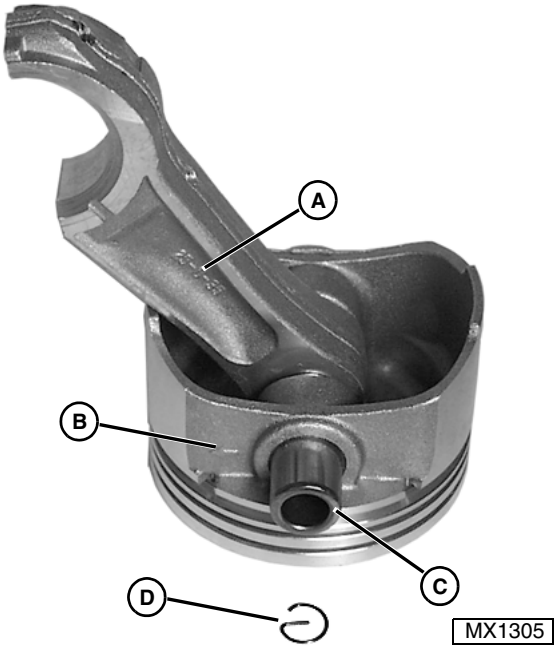
All Models . . . . . 24 N•m (210 lb-in.)

3. Measure inside diameter of connecting rod at crank pin (large) end. Replace connecting rod if greater than specification.

Specification:

All Models . 34.988 - 35.001 mm (1.3775 - 1.3780 in.)

CONNECTING ROD-TO-PISTON INSTALLATION



IMPORTANT: Install connecting rod so lettering (A) on connecting rod faces stamped "arrow" (B) side of piston. If piston does not have "arrow" stamping, connecting rod may be install in any direction.

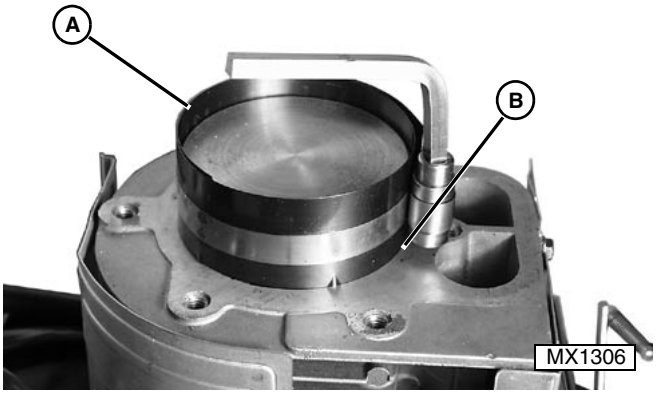
1. Inspect small end of connecting rod and mating wrist pin (C) for damage. Replace damaged parts.
2. Apply light coat of clean engine oil to wrist pin, piston bores, and connecting rod end.
3. Attach connecting rod to piston with wrist pin and two retaining rings (D). Use wooden dowel to drive wrist pin into position.

PISTON ASSEMBLY INSTALLATION

Equipment:

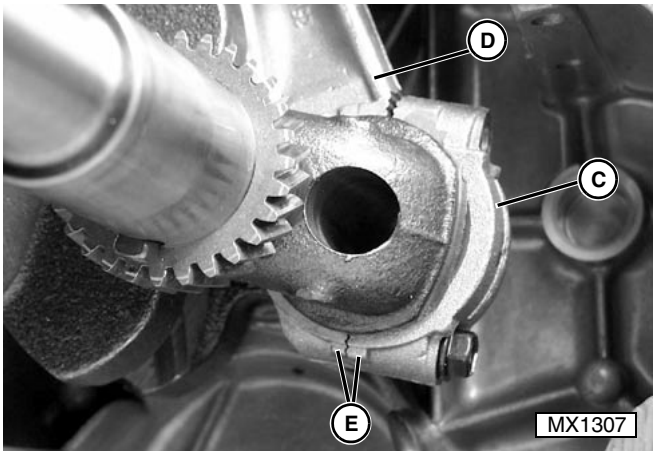
- JDG1322 Piston Ring Compressor

Procedure:

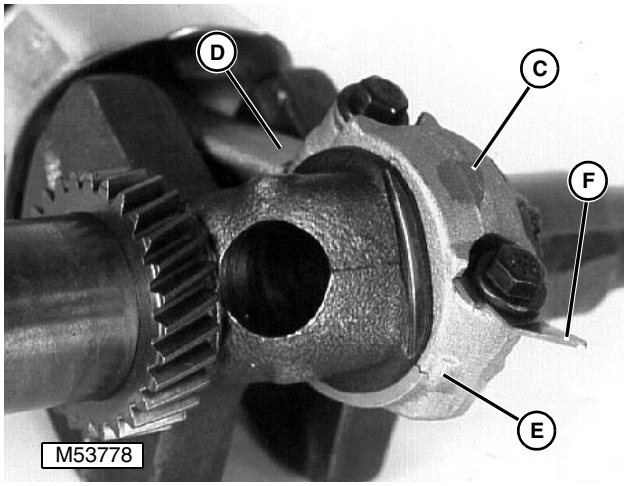


IMPORTANT: Properly orient piston assembly before tapping it straight down into cylinder. Avoid turning piston once rings are enclosed in cylinder bore. Make sure piston ring end gaps are staggered and facing AWAY from "trench area" between valve ports. For models with "orientation arrows", BE SURE arrows on piston will face valves "trench area".

1. Apply light coat of clean engine oil to bearing mating surfaces of connecting rod, rod cap, and crankpin journal before assembly.
2. Install piston assembly using ring compressor (A) so piston ring end gaps remain staggered and facing AWAY from valves "trench area" (B) and connecting rod bushing is aligned with crankpin journal.



1332DDE



924DE, 1128DE, and 1128DDE

NOTE: Crankshaft and piston assembly removed for clarity purposes only.

3. Position piston assembly so rod cap (C) and connecting rod (D) match cast boss (E). Cast boss (E) should be facing out towards crankcase cover/ PTO side of engine. Install oil dipper (F) (924DE, 1128DE, and 1128DDE models only) on same side as cast boss.
4. Tighten connecting rod cap screws to specification.

Specification:

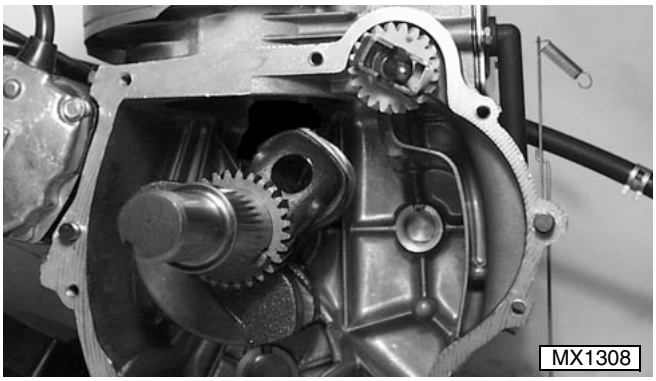
All Models . . . . . 24 N•m (210 lb-in.).

5. Install camshaft, counterbalance shaft (1332DDE Model only), drive gear assembly, cylinder head, and crankcase cover. (See appropriate procedures in this section.)
6. Install engine to snowblower. (See appropriate procedures in this section.)

CRANKSHAFT

Removal and Installation:

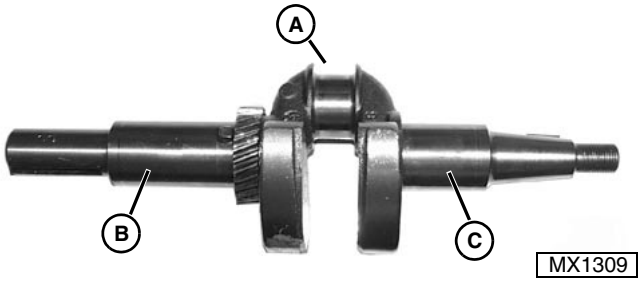
1. Remove piston assembly. (See “PISTON ASSEMBLY/DISASSEMBLY AND VISUAL INSPECTION” on page58.)


MX1308

2. Remove crankshaft and main seal. Discard seal.
3. Inspect crankshaft. (See next procedure.)
4. Install new main seal, outside-in, until outside surfaces are flush.
5. Apply engine oil to lip of main seal and mating surfaces of main bearing and crankshaft journal.
6. Cover crankshaft keyway with tape to protect seal.
7. Carefully install crankshaft. DO NOT damage seal.

Inspection:

1. Inspect for scoring, cracks, or chipped teeth.



MX1309

2. Measure outside diameter of rod crankpin journal (A), main bearing journal, PTO end (B), and main bearing journal, flywheel end (C). Replace crankshaft if damaged or not within specifications.

Specifications (All models):

Main Bearing Journal Diameter - Flywheel End
. . . . . 34.912 - 34.925 mm (1.3745 - 1.3750 in.)
Main Bearing Journal Diameter - PTO End
. . . . . 34.912 - 34.925 mm (1.3745 - 1.3750 in.)
Crankpin Journal Diameter
. . . . . 34.900 - 34.912 mm (1.3740 - 1.3745 in.)

CYLINDER BLOCK

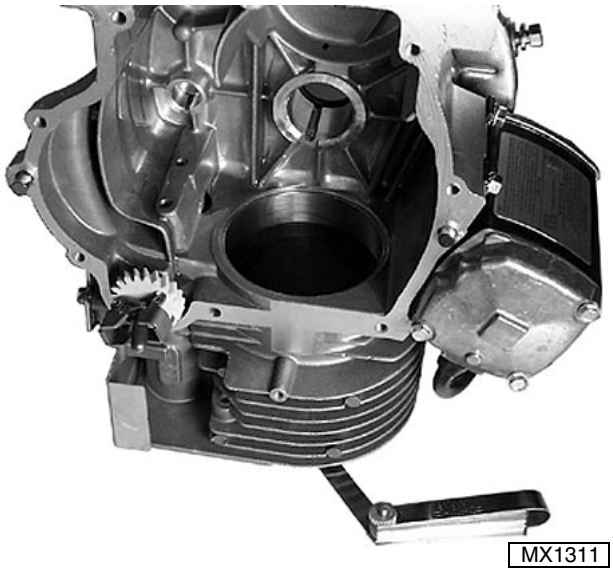
Inspection:

All components must be removed from cylinder block before inspection or machine work can be done. (See appropriate procedures throughout this section.)


MX1310

1332DDE Model shown (other models similar)

1. Clean and check cylinder block for cracks:
   - first perform a close visual inspection,
   - cracks not visible to the naked eye may be detected by coating the suspected area with a mixture of 25 percent kerosene and 75 percent light engine oil,
   - wipe area dry and immediately apply coating of zinc oxide dissolved in wood alcohol,
   - if crack is present, coating becomes discolored at the defective area,
   - replace block if any cracks are found.
2. Check for broken cooling fins and replace block if any are found.

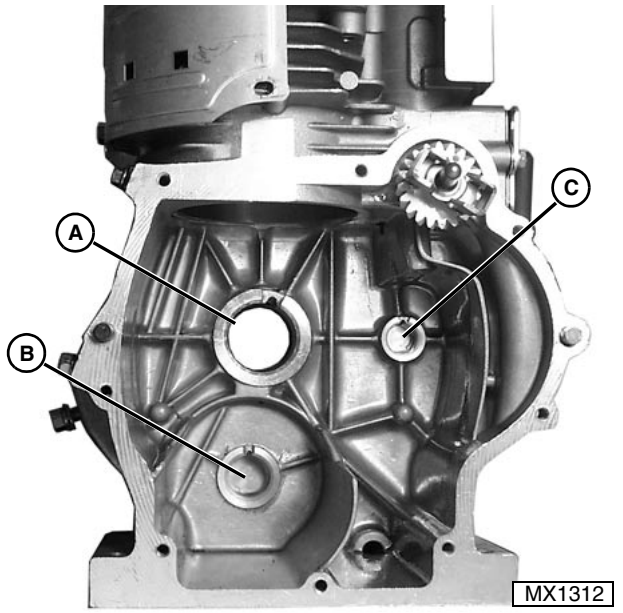

MX1311

1332DDE Model shown (other models similar)

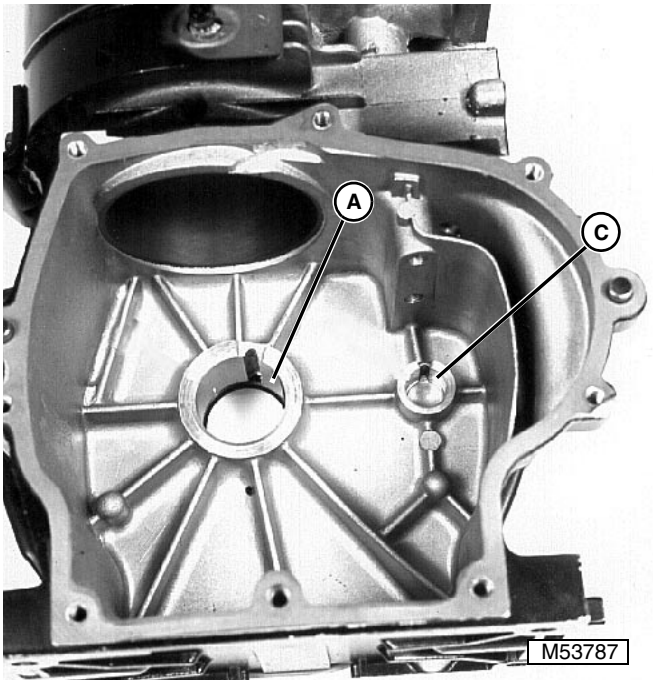
3. Use a surface plate to check for warped cylinder head seating surface. Replace cylinder block if seating surface exceeds specification.

Specification:

Warpage (Maximum) . . . . . 0.05 mm (0.002 in.).



1332DDE

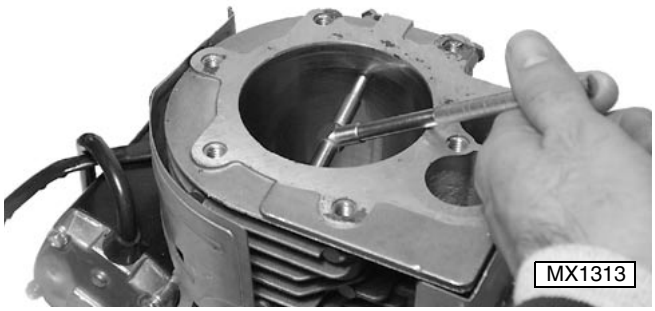


924DE, 1128DE and 1128DDE

4. Check crankshaft (A), counterbalance shaft (B) (1332DDE model only), and camshaft (C) bores for wear or damage. Replace cylinder block if not within specifications.

Specifications (All models):

Crankshaft Main Bearing Bore
. . . . . 34.963 - 34.976 mm (1.3765 - 1.3770 in.)
Camshaft Bearing Bore
. . . . . 15.824 - 15.837 mm (0.6230 - 0.6235 in.)

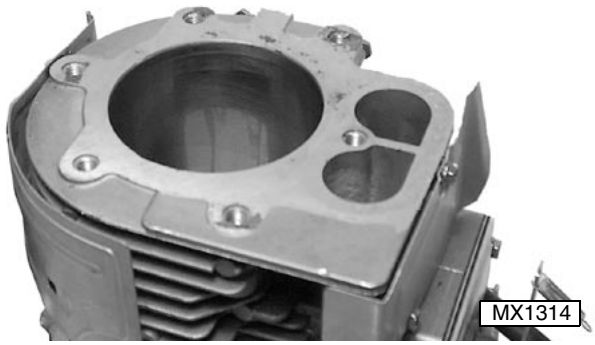


5. Measure piston bore inside diameter at six places: two measurements 90 degrees apart at top, middle and bottom of ring travel.
6. If cylinder bore is worn more than **0.127 mm (0.005 in.)** oversize, or scored, it should be replaced or rebored to **0.25 or 0.50 mm (0.01 or 0.02 in.)** oversize.

Specifications:

Cylinder Bore (Standard)
924DE, 1128DE, and 1128DDE . 79.375 - 79.400 mm
. . . . . (3.125 - 3.126 in.)
1332DDE . . . . . 84.125 - 84.150 mm
. . . . . (3.312 - 3.313 in.)

Deglazing:

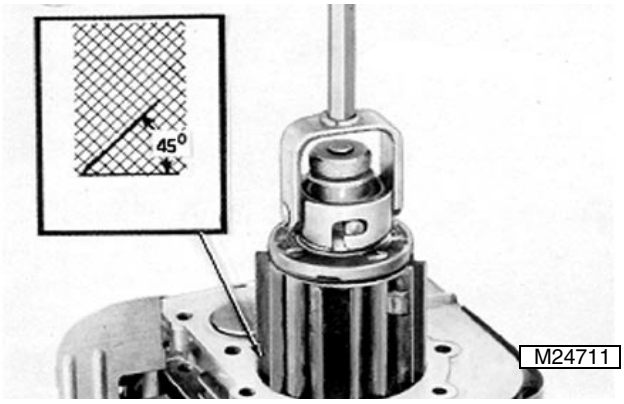


IMPORTANT: Remove crankshaft and internal engine components when deglazing cylinder. Abrasives can cause engine damage.

1. Deglaze cylinder bore using flex-hone to obtain 45 degree crosshatch pattern.
2. Clean abrasive residue from cylinder using warm soapy water until clean white rags show no discoloration.

3. Dry cylinder and apply engine oil.

Rebore:



*NOTE: The cylinder block can be rebored to use **0.25 and 0.50 mm (0.010 and 0.020 in.)** oversize pistons and rings.*

1. Align center of bore to drill press center.

IMPORTANT: Check stone for wear or damage. Use correct stone.

2. Adjust hone so lower end is even with lower end of cylinder bore.
3. Adjust coarse hone stones until they contact narrowest point of cylinder.
4. Coat cylinder with honing oil. Hone should turn by hand. Adjust if too tight.
5. Run drill press at about **600 RPM**. Move hone up and down about 50 times per minute.

NOTE: Measure bore when cylinder is cool.

6. Stop press and check cylinder diameter several times during honing.

*NOTE: Finish should not be smooth. It should have **45° crosshatch** pattern.*

7. Remove hone when cylinder is within **0.05 mm (0.002 in.)** of desired size.
8. Hone with burnishing stones until within **0.013 mm (0.0005 in.)** of desired size.
9. Hone with finish stones (380-390 grit) to final size.
10. Check bore for size, taper and out-of-round. (See this group.)

IMPORTANT: DO NOT use solvents to clean cylinder bore. Solvents will not remove metal particles produced during honing.

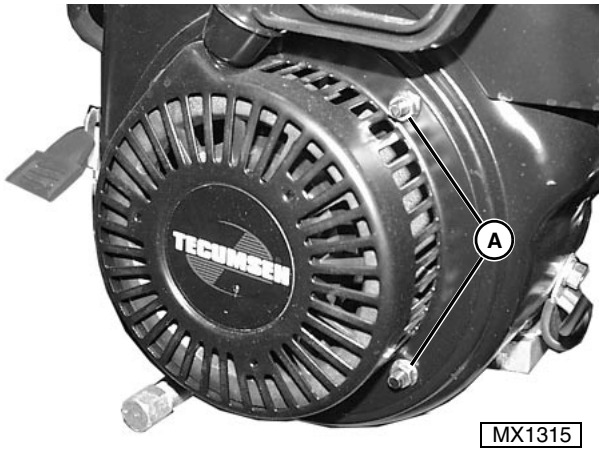
11. Clean cylinder thoroughly using warm soapy water until clean white rags show no discoloration.
12. Dry cylinder and apply thin layer of specified, clean engine oil.

ASSEMBLE ENGINE

Assembly of engine is done in reverse order of disassembly. Coat all necessary components and mating surfaces with a thin layer of specified, new engine oil. Tighten all fasteners to specification.

RECOIL STARTER

Removal:



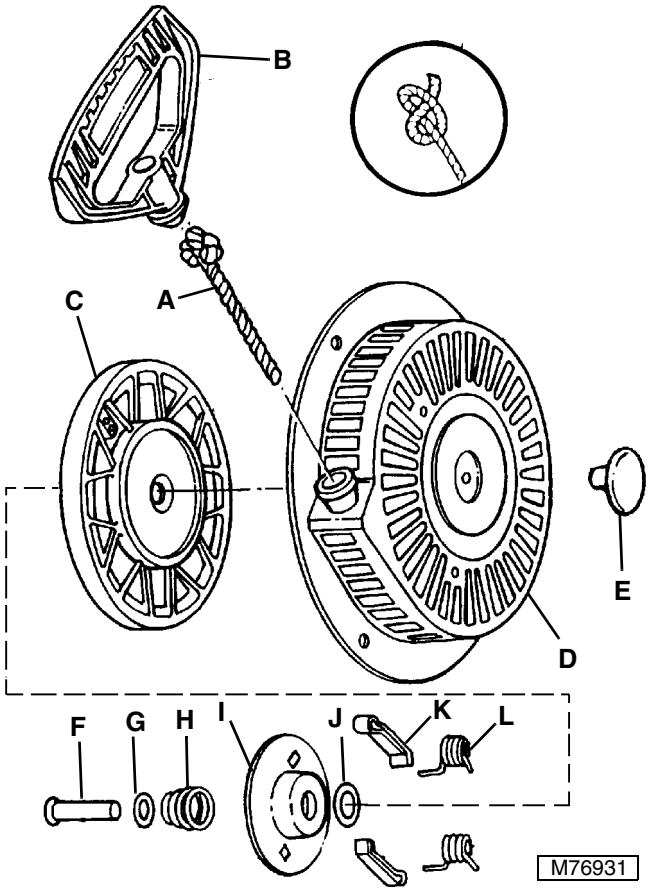
1. Remove nuts (A).
2. Remove starter.

Installation:

1. Install starter.
2. Install nuts. Tighten to **5.5 - 9 N•m (50 - 80 lb-in.)**.

Inspection:

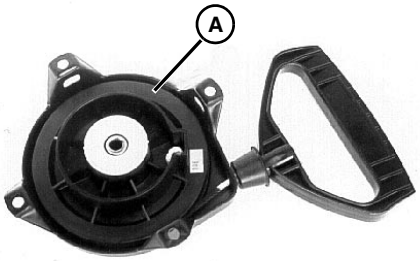
NOTE: Some components vary slightly in appearance from model-to-model.



A. Rope	**G. Brake Spring Wash**
B. Handle	**H. Brake Spring**
C. Pulley/Spring	**I. Dog Retainer**
D. Housing	**J. Washer**
E. Cap/Decal	**K. Dog**
F. Spring Pin	**L. Dog Spring**

1. Release spring tension:
 • Untie knot in rope at handle (See insert)
 • Slowly allow spring to unwind
2. Remove spring pin (F).
3. Inspect parts. Replace if worn or damaged.
4. Assemble parts:
 • Check that springs (L) snap dogs (K) back to pulley center
 • Dog tips point inward
5. Add an additional brake spring washer (G) and drive in new spring pin (F).
6. Adjust spring tension:
 • Install rope on pulley (C) in counterclockwise direction (from dog housing side)
 • Rotate pulley one turn counterclockwise (from dog housing side)
 • Thread rope through hole in housing (D)
 • Thread rope through handle. Secure with washer and left hand knot. (See inset circle above.)

Rope Replacement:



1. Remove recoil starter.
2. Pull handle out far enough to grasp rope, then push handle toward recoil mechanism to expose knot.
3. Untie knot in rope to remove handle.
4. Release spring tension slowly.
5. Remove pulley assembly (A).
6. Replace rope with No. 4-1/2 or No. 5 braided rope, **1.65 m (65 in.)** long.
 • Cauterize rope ends with match to prevent unraveling
 • Wind rope on pulley in counterclockwise direction
7. Install pulley assembly.
8. Adjust pulley tension.

NOTES:

CONTENTS

Page

READING ELECTRICAL SCHEMATICS

The schematic is made up of individual circuits laid out in a sequence of related functions. It is formatted with all power wires (A) across the top and all ground wires (B) across the bottom. Current flow is generally from top to bottom through each circuit and component. All components are shown in the OFF position. The diagram does not list connector (C) information unless needed to avoid confusion. If the connector is shown, the number next to it is the terminal pin location (D) in the connector.

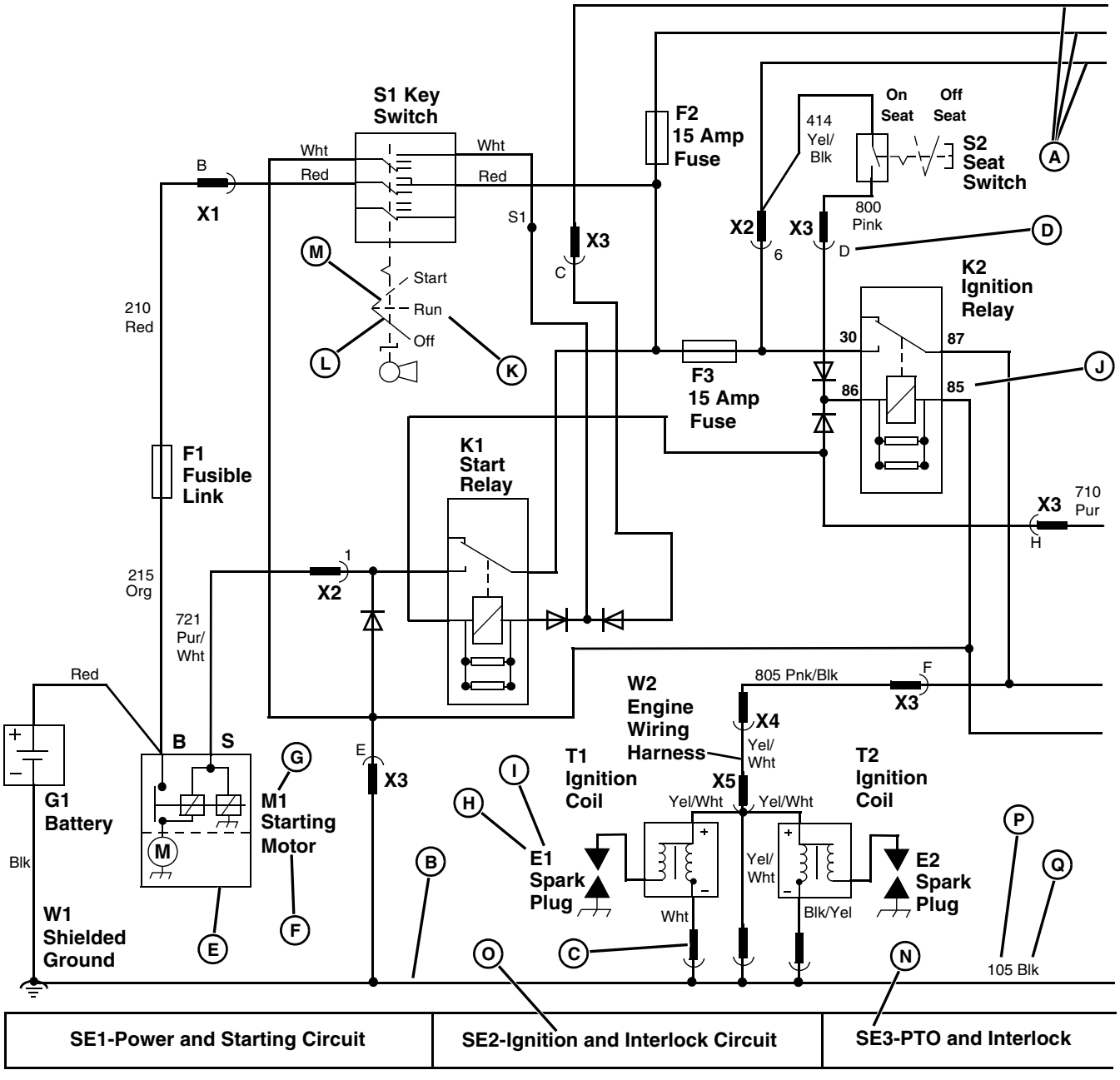
Each component is shown by a symbol (E), its name (F), and an identification code (G). The identification code contains a device identifying letter (H) and number (I).

The identifying letter is always the same for a specific component, but the identifying numbers are numbered consecutively from upper left to lower right. The terminal designation (J) is placed directly outside the symbol next to the connecting wire path. Switch positions (K) are also placed directly outside the symbol. The solid line (L) shows the position the switch is currently in and dash lines (M) represent other switch positions.

Each circuit is identified at the bottom of the drawing by a section number (N) and section name (O).

The circuit number (P) and wire color (Q) of the wires are shown directly next to the wire path.

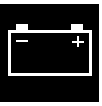
The same component name and identification code are used consistently on all diagrams in this section. Components can be easily cross-referenced.



THEORY AND DIAGNOSTIC INFORMATION

THEORY OF OPERATION INFORMATION

The theory of operation stories divide the electrical system into individual circuits by function. Each circuit is isolated from the main wiring schematic and only shows the components that are used in it. The story contains information on function, operating conditions, and theory of operation. The circuit schematics are drawn with the components in the operating position, with the power, or battery positive, into them across the top and the ground, or battery negative, across the bottom.



DIAGNOSTIC INFORMATION

The diagnostic procedures is used to test the complete circuit regardless of the problem or complaint. Select a symptom or system from the quick check or troubleshooting chart and follow the test procedures under that heading.

The diagnostic procedure lists:

- Test conditions
- Test sequence
- Test location
- Normal reading
- Check or test to perform if reading is not normal

When performing the test or check, be sure to set your machine up to the test conditions listed and follow the sequence carefully. The middle **"NORMAL"** column gives the reading or condition that should be obtained when performing the test or check. If the results of the test or check are not normal, perform the test, check, or adjustment listed in the third **"IF NOT NORMAL"** column to repair the malfunction. The detailed tests or adjustments referred to in the **"IF NOT NORMAL"** column are located at the end of that group. The system diagram that accompanies each test procedure is drawn to resemble machine components. The key number on the art matches the number in the **"TEST LOCATION"** column and the leader line points to the exact point the test is to be made.

WIRE COLOR ABBREVIATION CHART

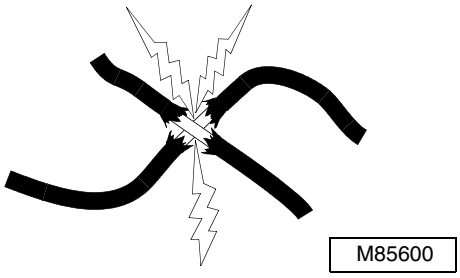
Blk	Black
Blu	Blue
Brn	Brown
Grn	Green
Gry	Gray
Org	Orange
Pnk	Pink
Pur	Purple
Red	Red
Tan	Tan
Wht	White
Yel	Yellow
Blk/Wht	Black/White
Blu/Wht	Blue/White
Brn/Wht	Brown/White
Brn/Yel	Brown/Yellow
Dk Blu	Dark Blue
Dk Brn/Lt Grn	Dark Brown/Light Green
Dk Brn/Red	Dark Brown/Red
Dk Brn/Yel	Dark Brown/Yellow
Dk Grn	Dark Green
Lt Blue	Light Blue
Lt Grn	Light Green
Org/Wht	Orange/White
Pnk/Blk	Pink/Black
Pur/Wht	Purple/White
Red/Blk	Red/Black
Red/Wht	Red/White
Wht/Blk	White/Black
Wht/Red	White/Red
Yel/Blk	Yellow/Black
Yel/Red	Yellow/Red
Yel/Wht	Yellow/White

COMMON CIRCUIT TESTS

Shorted Circuit:

A shorted circuit may result in the wrong component operating (i.e. improper wire-to-wire contact). To test for a shorted or improperly wired circuit:

1. Turn component switch ON.
2. Start at the controlling switch of the component that should not be operating.
3. Follow the circuit and disconnect wires at connectors until component stops operating.
4. Shorted or improper connections will be the last two wires disconnected.

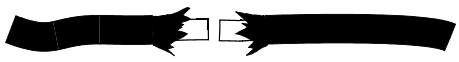


M85600

High Resistance or Open Circuit:

High resistance or open circuits usually result in slow, dim or no component operation (i.e. poor, corroded, or disconnected connections). Voltage at the component will be low when the component is in operation. To test for high resistance and open circuits:

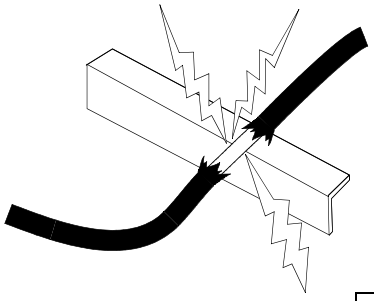
1. Check all terminals and grounds of the circuit for corrosion.
2. If terminals are not corroded or loose, the problem is in the component or wiring.



M85601

Grounded Circuit:

Grounded circuits usually result in no component operation or a blown fuse.



M85602

CONDUCTORS FOR 12 VOLT CIRCUITS

STRANDED CONDUCTORS FOR 12 VOLT CIRCUITS						
SAE WIRE SIZE (GAUGE)	20	18	16	14	12	10
METRIC WIRE SIZE (MM)	0.5	0.8	1.0	2.0	3.0	5.0
TYPICAL STRANDING	7 X 28	16 X 30	19 X 29	19 X 27	19 X 25	19 X 23
MINIMUM CONDUCTOR AREA IN CIRCULAR MILS	1072	1537	2336	3702	5833	9343

SPECIFICATIONS

ELECTRICAL

Ignition:

Ignition Module . . . . . Electronic Capacitor Discharge Ignition (CDI) System
Ignition Module Air Gap. . . . . 0.32 mm (0.013 in.)
Spark Plug. RN4C
Type . . . . . Resistor
Gap . . . . . 0.762 mm (0.030 in.)

Stator:

924DE and1128DE
Size . . . . . .18 watt
AC output (voltage at fast idle) . . . . . .10 volts AC (min)
1128DDE and 1332DDE
Size . . . . . .3 and 5 amps
DC output (voltage at fast idle) . . . . . .13 volts DC (min)
AC output (voltage at fast idle) . . . . . .13 volts AC (min)

Lighting:

Headlights . . . . . .GE 1156 or equivalent

Starting:

Recoil Start . . . . . Standard
Electric Starter Voltage . . . . . .Standard 120 VAC

TOOLS

D05351ST Spark Tester . . . . . Testing spark conditions
Multimeter . . . . . Test related electrical system components
Continuity Tester or Ohmmeter . . . . . Testing for open/closed circuits

TORQUE SPECIFICATIONS

Electric Starter Mounting Cap Screws . . . . . 11 N•m (100 lb-in.)
Starting Motor Case Assembly Cap Screws . . . . . 6 N•m (50 lb-in.)
Spark Plug. . . . . 28.5 N•m (250 lb-in.)
Ignition Module Mounting Stud to Cylinder . . . . . 4.5 N•m (40 lb-in.)
Ignition Module Screw to Mounting Stud. . . . . 5 N•m (44 lb-in.)
Flywheel Nut . . . . . 79 N•m (58 lb-ft)

THEORY OF OPERATION

IGNITION SYSTEM

Function:

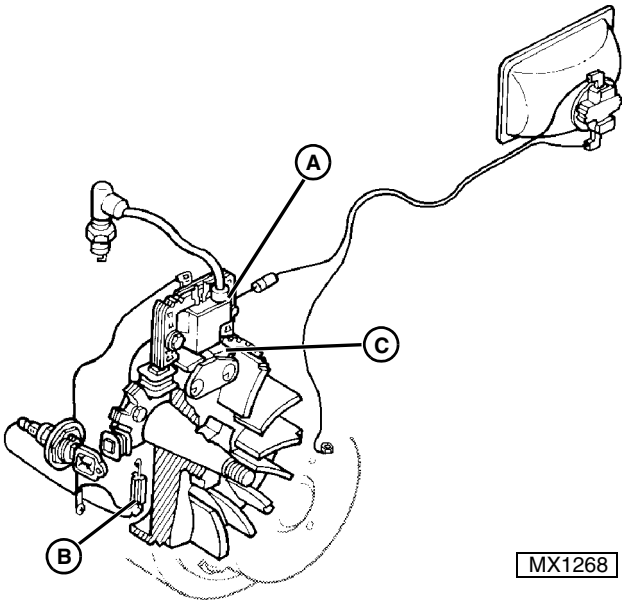
Provides a high voltage spark to the fuel/air mixture in the engine cylinder.

Major Components:

Flywheel magnets, ignition module, high tension lead, spark plug, grounding switch, key switch.

Theory of Operation:

Engines have solid state “capacitor discharge” ignition, called CDI. The ignition module (A) is completely sealed. The ignition module has a high tension lead which connects to the spark plug, and a grounding lead which connects to grounding locations at the key switch and stop switch (B).



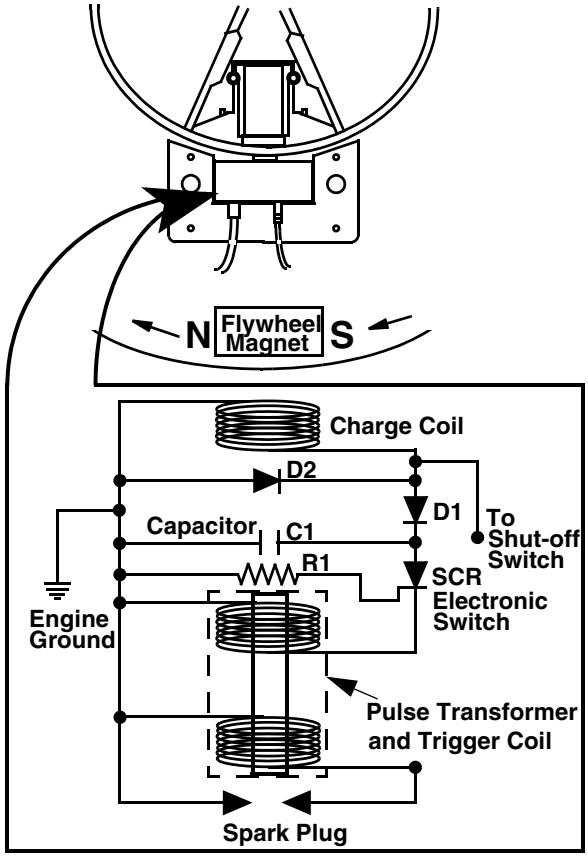
The module and ignition circuit provide electrical energy required to “fire” the spark plug. Engine rotation causes electrical energy to be created and stored in the ignition module as permanent magnets (C) mounted on the flywheel rotate past it. A high tension lead provides the path to discharge the stored energy and fire the spark plug.

The key switch and stop switch provide two separate means to stop the engine by grounding out the key switch in the “OFF” position. The module is also grounded when the operator moves the throttle to the “STOP” position, which closes the stop switch, completing the path to ground at the engine shroud.

CDI Ignition:

As the magnets in the flywheel rotate past the charge coil, electrical energy is produced in the module. The energy is stored in the capacitor (approximately 200 volts) until it is released by an electrical switch (SCR). As the magnet continues to rotate, it passes a trigger coil where a low voltage signal is produced. This low voltage signal closes the SCR switch, allowing the energy stored in the capacitor to flow to a transformer where the voltage is increased from 200 volts to 25,000 volts. This voltage travels along the high tension lead to the spark plug where it arcs across the electrodes and ignites the fuel air mixture. The ignition module is completely sealed.

No separate repairs can be made to the unit. If it malfunctions the entire unit must be replaced.



HEADLIGHT

Function:

Provide power for the headlight.

Major Components:

Flywheel magnets, stator, headlight.

Theory of Operation:

Alternating current (AC) is produced at the stator as the permanent magnets on the inside of the flywheel rotate past it. This current provides a source of power for the headlight.

Voltage output is not regulated, and will vary from approximately 6 to 10 volts depending on engine rpm.

HAND WARMERS

Function:

Provides power to heat the hand warmers.

Major Components:

Flywheel magnets, stator, diode, switch, hand warmers.

Theory of Operation:

Alternating current (AC) is produced at the stator. This current is converted from AC to direct current (DC) by a diode. This current runs through a series circuit in the resistors of the two hand warmers and provides a source of power for the hand warmers. The power is controlled (ON/OFF) by the switch.

120 VOLT STARTING MOTOR

Function:

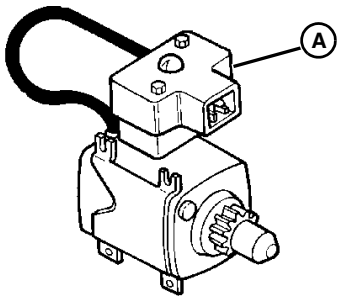
Start the engine using 120 volt household power.

Major Components:

Electric starting motor; switch box.

Theory of Operation:

The 120 volt starting motor includes a switch box (A) which also serves as the power cord plug inlet. Only grounded extension circuits should be used to start the motor.



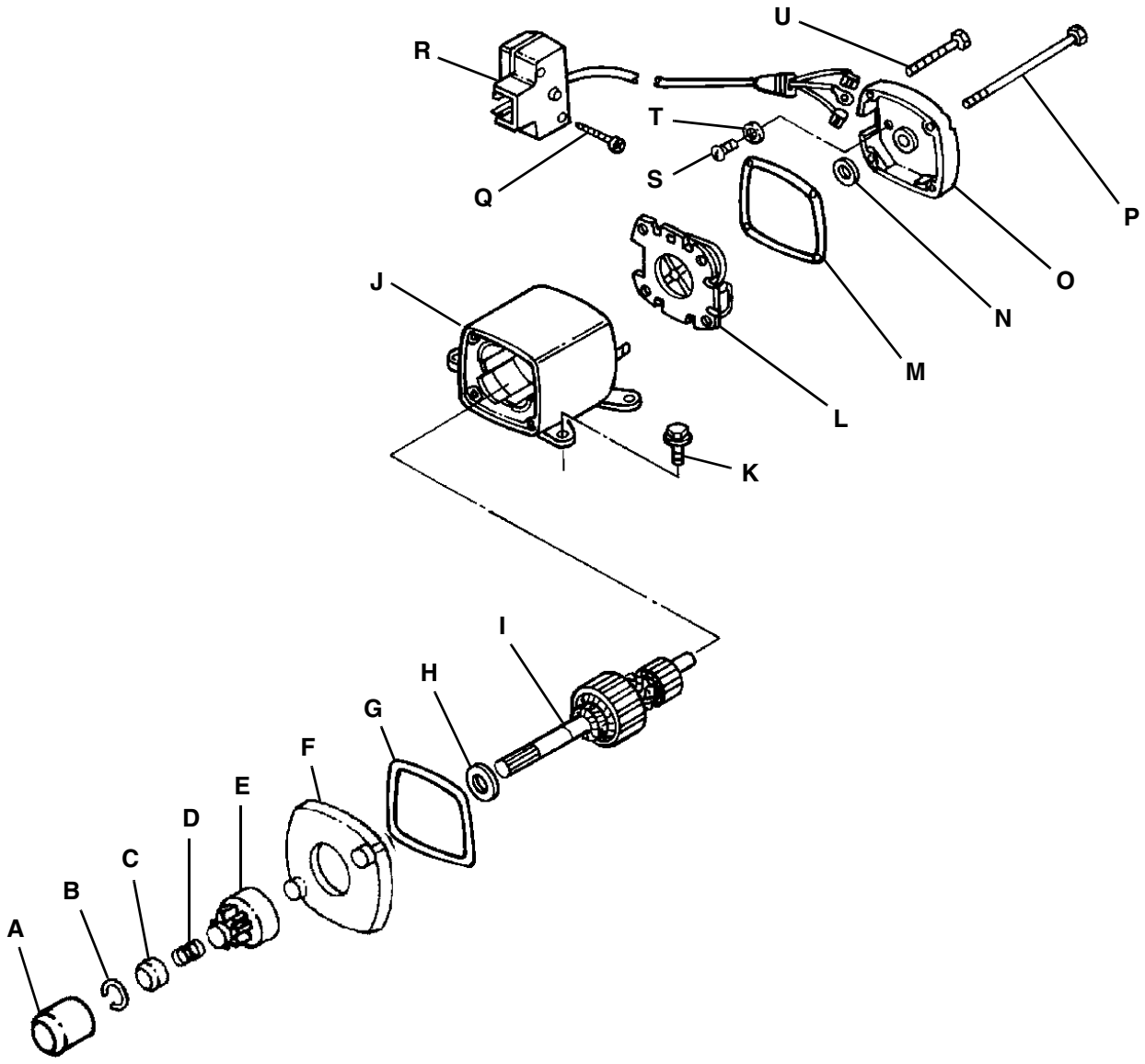
MX1270

The switch box is a sealed unit, and is serviced only with the electrical cord that attaches it to the starting motor.

The starting motor may be serviced. The field windings, armature and commutator may all be tested for proper operation.

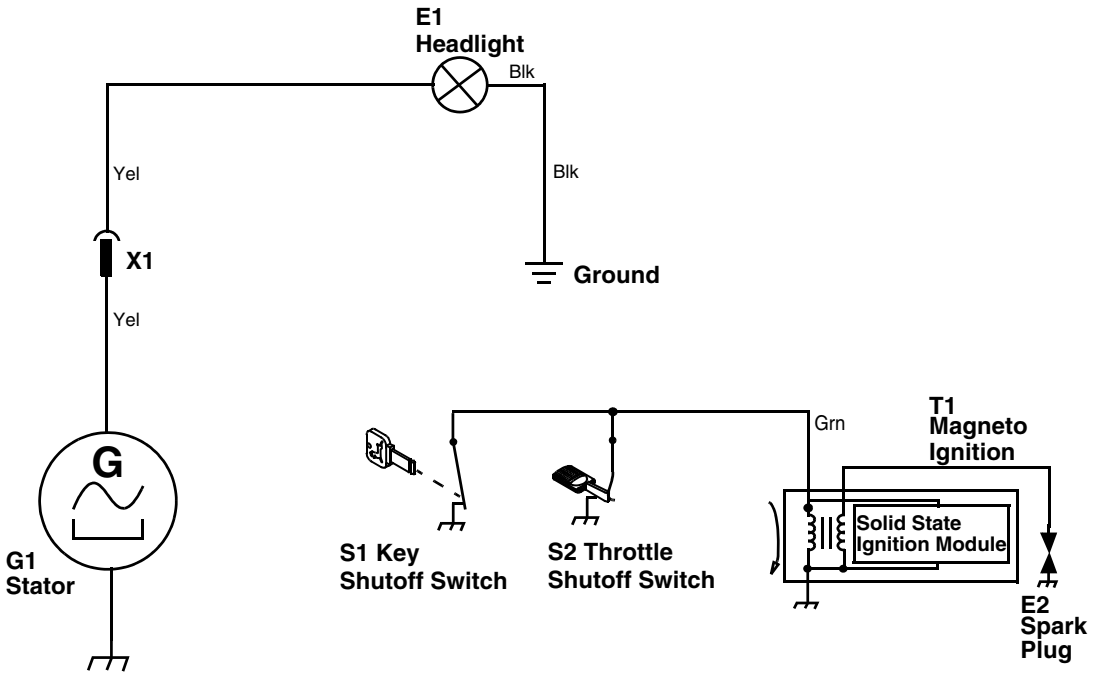
COMPONENT LOCATION

STARTING MOTOR

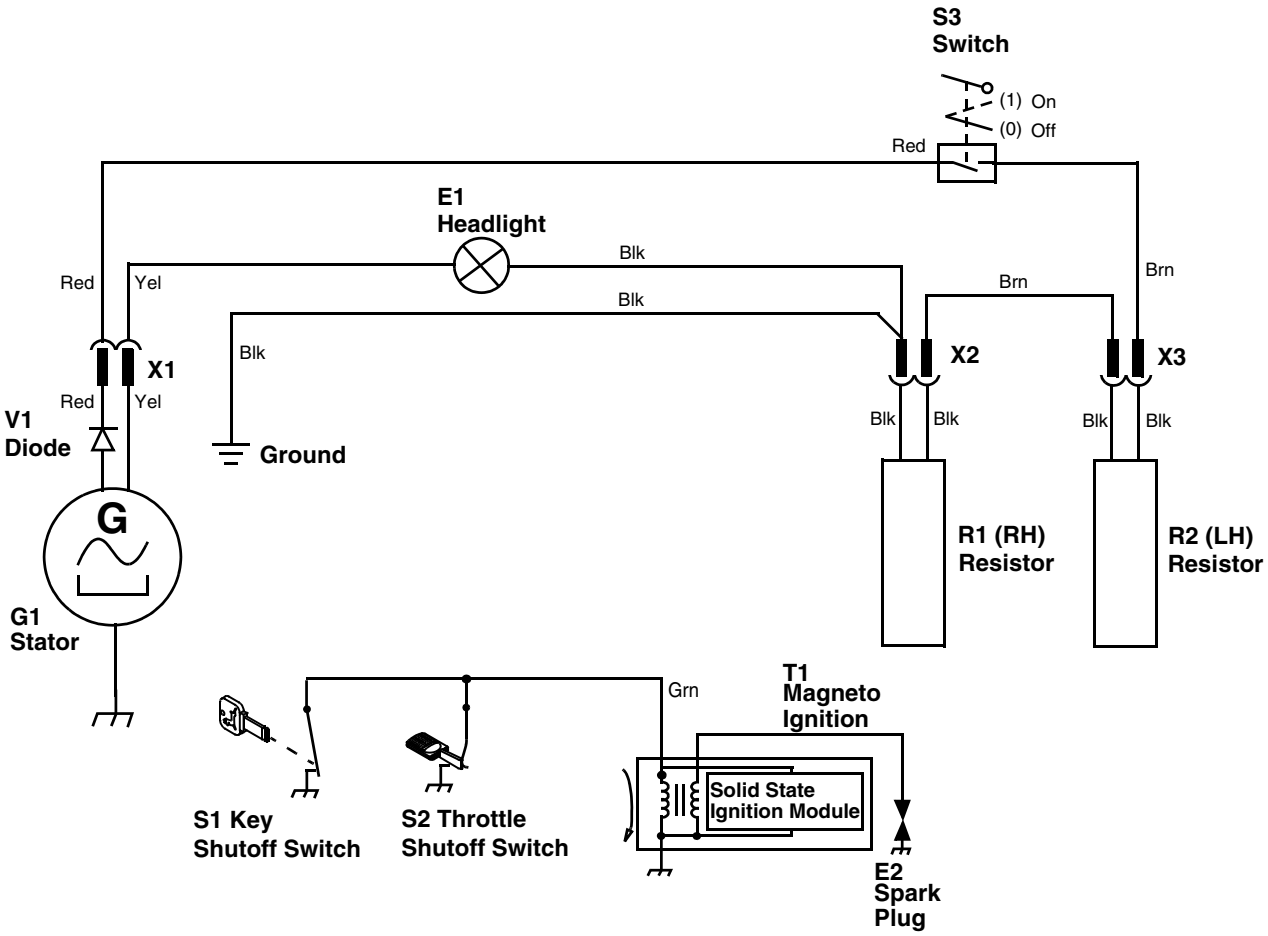


A. Cover
B. C-Clip
C. Keeper
D. Spring
E. Gear
F. Front Cover
G. Gasket
H. Washer
I. Armature Assembly
J. Body
K. Mounting Screw
L. Brush Plate
M. Gasket
N. Washer
O. Back Cover
P. Long Bolt
Q. Screw
R. Switch
S. Screw
T. Washer
U. Short Bolt

ELECTRICAL SCHEMATIC—924DE and 1128DE



ELECTRICAL SCHEMATIC—1128DDE and 1332DDE



DIAGNOSTICS

IGNITION SYSTEM AND CDI MODULE

Test Conditions:

- Key switch “OFF”
- Transmission control in “Neutral”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Check for spark (remove and ground plug to engine. Key “ON”, throttle lever advanced)	Good spark. Plug gap at **0.76 mm (0.030 in.)**	Clean spark plug and set gap. Replace spark plug.
2. Test ignition module output (attach spark tester. Key “ON”, throttle lever advanced)	Tester shows good spark	Check ignition module air gap. Air gap clearance **0.32 mm (0.013 in.)**
3. Ignition timing (pull flywheel off, check key)	Key not sheared or partially sheared	Replace key, flywheel, and/or crankshaft.
4. Module ground wire (check continuity. Key “ON”, throttle advanced)	No continuity to ground	Check kill switch, check module.
5. Kill switch (check operation. Key switch “ON”, throttle at “STOP”)	Continuity from switch to ground	Check kill switch contacts.
6. Key switch (check continuity to ground)	“**OFF**”–Continuity to ground “**ON**”–No continuity to ground	Replace key switch.
7. Flywheel magnets	Strong magnets.	Replace flywheel.

120-VOLT STARTING MOTOR

Test Conditions:

- Key switch “OFF”
- Transmission control in “Neutral”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Engine spin	Engine rotates easily using hand pull	Check for loads on engine, such as belt drag.
2. Starting motor pinion (button switch engaged)	Pinion rotation	Check: 120 volt AC supply, button switch, starting motor brushes, commutator, and field coil.
3. Pinion to flywheel	Pinion engages flywheel	Clean or replace pinion.
4. Starting motor rotation	Starting motor rotates engine fast enough to start	Check: Starting motor brushes, commutator, and field coil.

HEADLIGHT CIRCUIT

Test Conditions:

- Key switch “OFF”
- Transmission control in “Neutral”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Headlight operation (engine running)	Headlight “ON” at all times	Check or replace bulb.
2. Circuit continuity (alternator stator connector to headlight ground)	Continuity	Repair connector or wiring.
3. Alternator stator output (A.C. output, engine running)	AC voltage (approximate) across headlight bulb: **2000 rpm – 6.0 volts AC** **3600 rpm – 10.0 volts AC**	Inspect stator and flywheel magnets.
4. Alternator stator (inspect windings)	Windings not burned or shorted to ground	Replace stator.
5. Flywheel (inspect magnets)	Magnets have good pull	Replace flywheel.

HAND WARMER CIRCUIT—1128DDE and 1332DDE

Test Conditions:

- Key switch “OFF”
- Transmission control in “Neutral”
- Auger drive disengaged
- Friction drive disengaged

Test/Check Point	Normal	If Not Normal
1. Hand warmer connector	2.3 ohms resistance through warmer	Replace hand warmer
2. Hand warmer connector	Continuity to ground	Check Brn and Blk wires and connections.
Test Conditions: • Auger drive disengaged • Friction drive disengaged • Transmission control in “Neutral” • Engine RUNNING		
3. Hand warmer ON/OFF switch	DC voltage (approximate) across Hand warmer: **2000 rpm – 8.0 volts DC** **3600 rpm – 13.0 volts DC**	Check Red wire and connections. Test Stator. (See ALTERNATOR OUTPUT TESTS—1128DDE and 1332DDE on page 15.)
4. Hand warmer connector	DC voltage (approximate) across Hand warmer: **2000 rpm – 8.0 volts DC** **3600 rpm – 13.0 volts DC**	Check Brn wires and connections. If OK, replace hand warmer ON/OFF switch.

TESTS AND ADJUSTMENTS

SPARK PLUG AIR GAP ADJUSTMENT

Reason:

To check if proper spark plug gap exists for optimum engine performance.

Equipment:

- Wire Feeler Gauge

Procedure:

1. Allow engine to cool sufficiently before beginning.
2. Remove, inspect, and clean spark plug.
3. Use a wire feeler gauge to set air gap.

Specification:

Air Gap . . . . . 0.76 mm (0.030 in.)

4. Install spark plug. Tighten to **28.5 N•m (250 lb-in.)**.

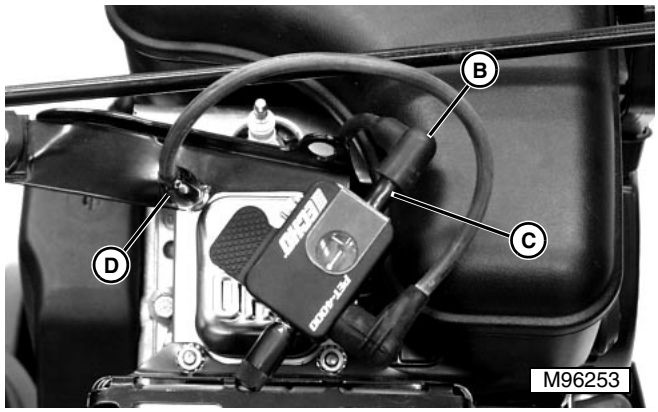
IGNITION MODULE SPARK TEST

Reason:

To determine causes of spark failure or verify good spark.

Equipment:

- D05351ST Spark Tester



IMPORTANT: DO NOT adjust spark tester air gap beyond nominal setting (A) – 6.0 mm (0.2 in.). Damage to ignition components and tester may occur.

Procedure:

1. Set tester air gap to nominal position (A).
2. Disconnect spark plug high tension lead (B) from spark plug.
3. Connect D05351ST Spark Tester terminal (C) to spark plug high tension lead (B).
4. Connect tester alligator clip (D) to engine grounding nut.
5. Move key switch to RUN position.
6. Move throttle lever to SLOW idle detent position.
7. Pull recoil starter quickly through full range of motion and watch tester for spark condition.

Results:

If Strong Spark Appears . . . . .Spark Plug Defective
. . . . . .or Air Gap Mis-Adjusted
If Weak Spark Appears . .Ignition Module Defective
. . . . . .or Air Gap Mis-Adjusted
. . . . . .or Flywheel Magnets Weak
. . . . . .or High Tension Lead Defective
If No Spark Appears. . . . .Ignition Module Defective
. . . . . or Flywheel Magnets Defective
. . . . . .or High Tension Lead Defective
. . . . . or Key Switch or Lead Defective

NOTE: If it is determined that the ignition module is defective, replace it. The ignition module does not have serviceable parts.

(See “REPAIR” on page 18 for appropriate procedures to correct defects.)

IGNITION MODULE AIR GAP ADJUSTMENT

Reason:

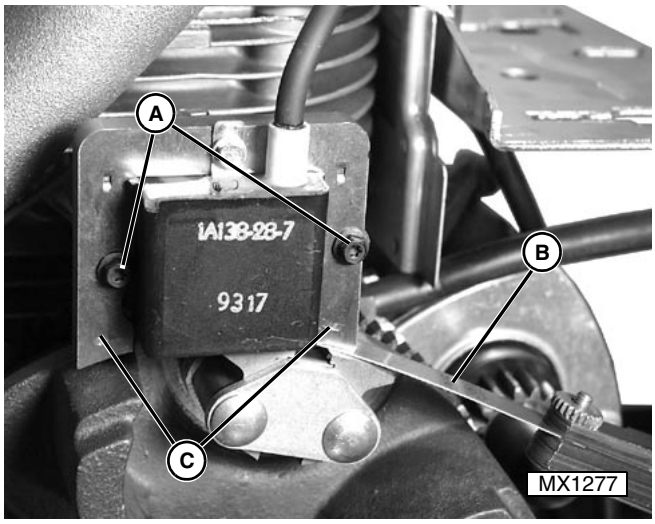
The ignition module must be gaped appropriately at the flywheel magnet to provide proper ignition.

Equipment:

- Flat Feeler Gauge

Procedure:

1. Remove blower housing.



2. Loosen two screws (A) on the module.
3. Position a **0.32 mm (0.013 in.)** feeler gauge (B) or gauges between both legs (C) of the module and the flywheel.

NOTE: It may be necessary to set air gap on one leg of the module at a time. If so, recheck air gaps after tightening screws.

4. The flywheel magnets will tend to pull the module into contact with it. Tighten two screws to specification.
5. Remove feeler gauge(s), rotate the flywheel and check clearance. Readjust if necessary.

Specifications:

Ignition Gap . . . . . 0.32 mm (0.013 in.)
Ignition Module Mounting Stud to Cylinder . . . . . 4.5 N•m (40 lb-in.)
Ignition Module Screws . . . . . 5 N•m (45 lb-in.)

FLYWHEEL MAGNET TEST

Reason:

To make sure flywheel magnet(s) have enough force to induce current into ignition coil.

Equipment:

- Screwdriver

Procedure:

1. Park machine on level surface and turn key switch to OFF position.
2. Remove flywheel blower housing from engine.
3. Loosely hold screwdriver blade about 19 mm (0.75 in.) away from magnet.

Results:

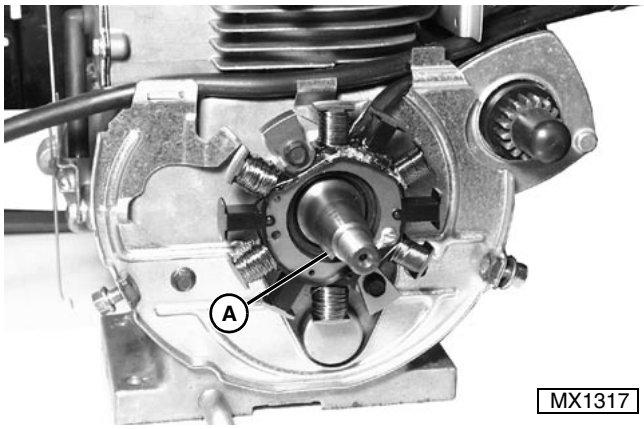
- Magnet should attract blade to it.
- If blade is NOT attracted to magnet, flywheel must be replaced.

FLYWHEEL KEY INSPECTION

Reason:

To inspect flywheel key for defects. The position of the flywheel key is essential for correct ignition timing. A sheared or partially sheared key will distort timing, affecting engine performance.

Procedure:



1. The flywheel must be removed in order to inspect the key (A). (See FLYWHEEL on page 40 Section 3 ENGINE.) The key must be in good condition. Always replace it if doubt exists.
2. Replace the key with an identical one. This key is designed for this engine application.

ALTERNATOR OUTPUT TEST—924DE and 1128DE

The engines have a small stator-type alternator mounted under the engine flywheel. The alternator produces alternating current (AC) to power the headlight. Output of the alternator will vary as engine rpm changes. Alternator output may be tested at various engine rpm values.

Reason:

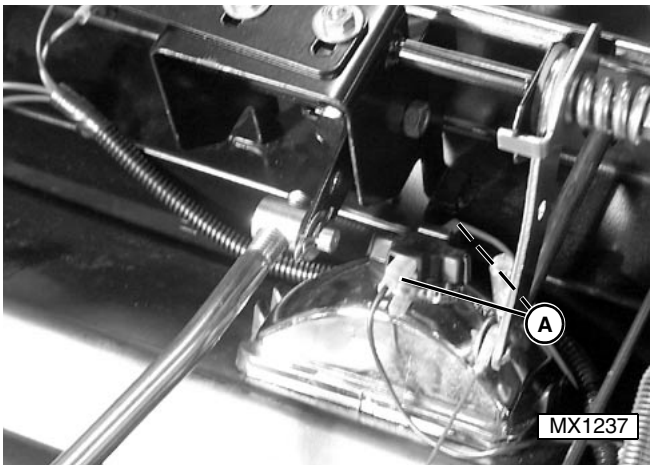
To determine proper output of stator.

Equipment:

- Tachometer
- Multimeter

Procedure:

1. Start and warm the engine. Use an engine tachometer to check engine speed.



2. Connect a multimeter set at AC volts across the headlight terminals (A).
3. Test output at various engine rpm. Test values should be approximately as listed:

Specifications:

2000 rpm . . . . . 6.0 volts AC
3600 rpm . . . . . 10.0 volts AC

Results:

- If test values are lower than required, replace the alternator.

ALTERNATOR OUTPUT TESTS—1128DDE and 1332DDE

The stator creates an alternating (AC) current. The alternator has two AC output wires. One wire provides AC voltage for the headlight. The second wire has an in-line diode in the engine wiring harness which converts the AC voltage to direct current (DC). The DC voltage provides power to the hand warmers.

The stator output test checks for both AC and DC voltage.

Reason:

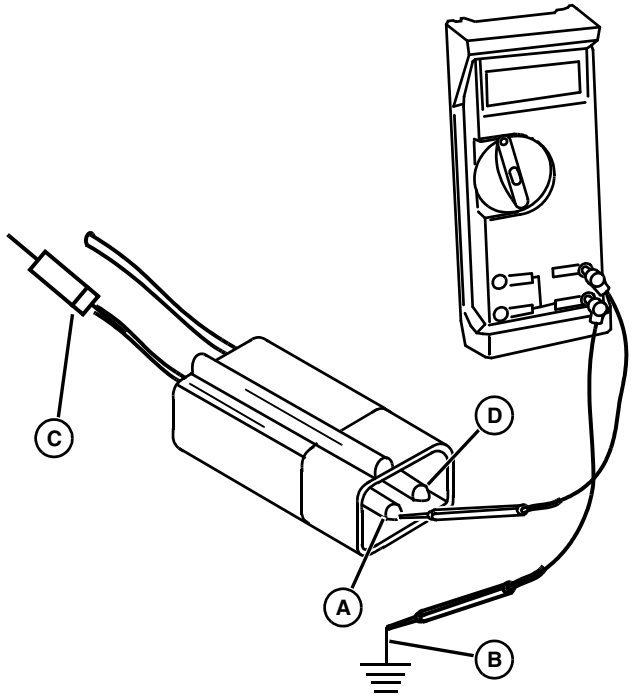
To determine proper output of stator.

Equipment:

- Multimeter

Procedure:

1. Disconnect connector from stator.
2. Set multimeter for DC volts.



3. Attach RED test lead to DC output pin (A) in connector.
4. Attach BLACK test lead to a good ground on the engine (B).
5. Start engine and run at full throttle.
6. Check output.

Specifications:

DC Output
2000 rpm . . . . . 8.0 volts DC
3600 rpm . . . . . 13.0 volts DC

Results:

- If no or low output is found, test diode (C).

7. Set multimeter for AC volts.
8. Attach RED test lead to AC output pin (D) in connector
9. Attach BLACK test lead to a good ground on the engine.
10. Start engine and run at full throttle.
11. Check output.

Specifications:

AC Output
2000 rpm . . . . . 8.5 volts AC
3600 rpm . . . . . 13.0 volts AC

Results:

- If no or low output is found, replace the alternator.

ALTERNATOR DIODE TEST—1128DDE and 1332DDE

Reason:

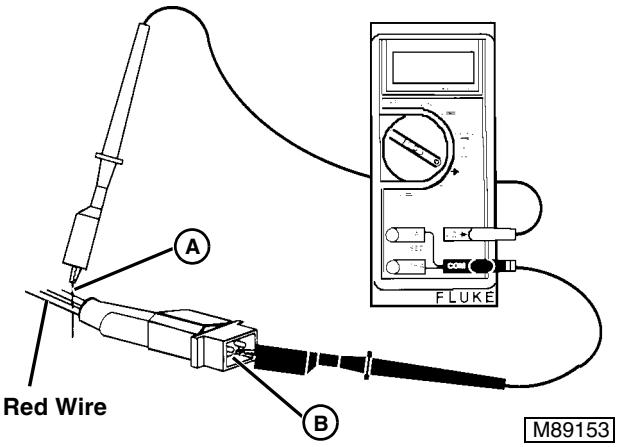
To determine alternator diode is functioning correctly.

Equipment:

- Multimeter with diode test function.

Procedure:

1. Disconnect connector from stator.
2. Set multimeter for Diode Test position.
3. Insert RED test lead into VOLTS receptacle in meter.
4. Insert BLACK test lead into COM receptacle in meter.



5. Attach RED test lead clip to point (A). (It may be necessary to pierce wire with a pin as shown.)
6. Attach BLACK test lead clip to point (B) (DC output pin).

Results:

- If meter beeps once, diode is OK.
- If meter makes a continuous tone, diode is defective (shorted). Replace diode.
- If meter displays “OL”, proceed to step 7.

7. Reverse test leads.

Results:

- If meter beeps once, diode is installed backwards. Replace diode.
- If meter still displays OL, diode is defective (open). Replace diode.

IGNITION GROUND TESTS

The engine is stopped by grounding out the ignition module. There are two places the module may be grounded. One is through the key switch with the key in “OFF” position. The other location is through the throttle switch, when the throttle is placed in the “STOP” position.

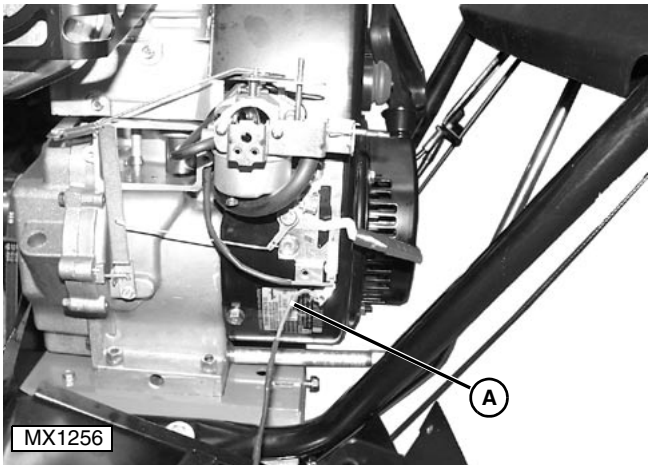
Reason:

To test grounding outlets for stopping engine.

Equipment:

- Continuity tester

Key switch ground switch test procedure:



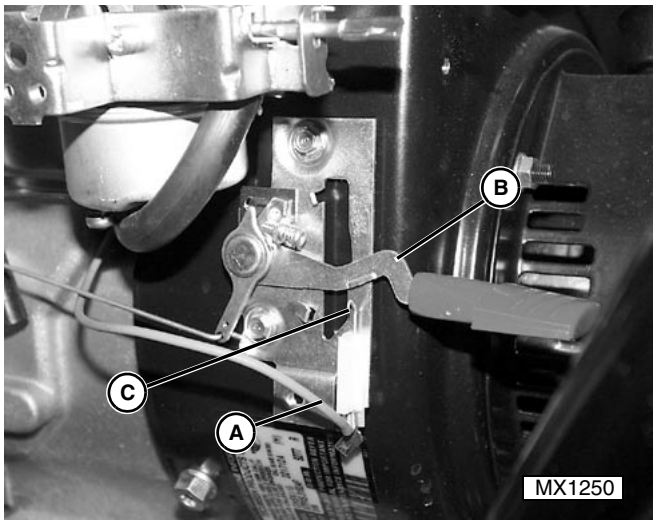
1332DDE Model Shown
(carburetor cover removed for clarity)

1. Disconnect grounding lead (A). Connect a continuity tester between the lead and a good engine ground.
2. Check for continuity with the key “ON” and “OFF”.

Results:

- There should be continuity only with the key in the “OFF” position. Replace the key switch if necessary.

Stop switch ground test procedure:



1. Connect a continuity tester to ground terminal (A). Connect the other test lead to a good engine ground.
2. Check operation of the switch. There should be continuity only when the throttle lever (B) is positioned at “STOP”.

Results:

- Inspect the stop switch wire contact (C) for proper deflection as the throttle lever (B) moves up and down. Repair as necessary.

STARTING MOTOR FIELD COIL TEST

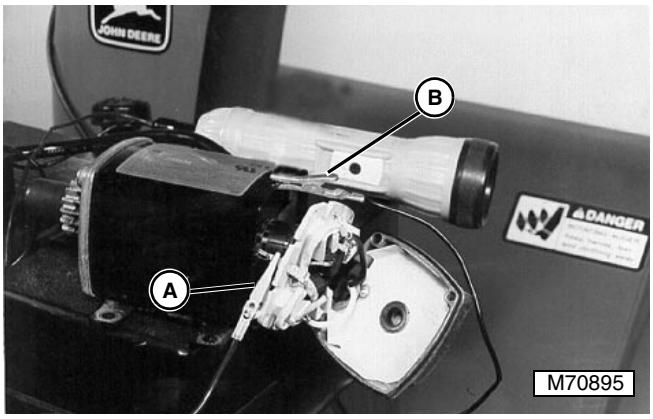
Reason:

To test function starter motor field coil for proper operation.

Equipment:

- Continuity tester

Procedure:



1. Connect one clip of a continuity tester to a field lead connector (A); connect the other lead to the starting motor housing (B). The test light should not light.

Results:

- If test light lights, a grounded condition exists, and the starting motor must be replaced.
- If test light does not light, the field coil is operational.

HAND WARMER RESISTANCE TEST —1128DDE and 1332DDE

Reason:

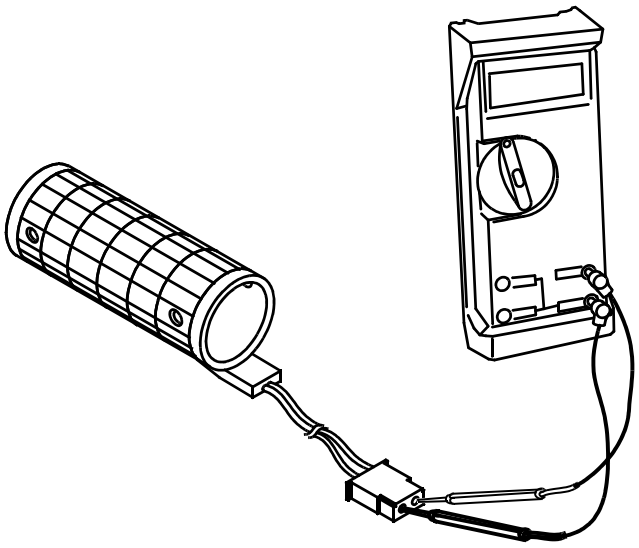
To test hand warmer.

Equipment:

- Continuity tester

Procedure:

1. Disconnect the connector closest to the hand warmer(s).



2. Connect a continuity tester to each terminal of the hand warmer.
3. Measure the resistance in each hand warmer. The resistance should be approximately **2.3 ohms**.

Specification:

Hand Warmer Resistance . . . . . .2.3 ohms

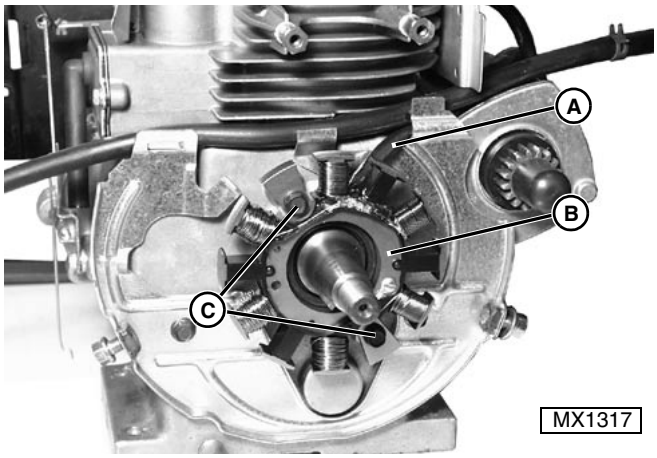
Results:

- If the resistance does not meet the specification, **+/- 1.0 Ohm,** replace the hand warmer.

REPAIR

STATOR REMOVAL AND INSTALLATION

1. Remove flywheel. (See FLYWHEEL on page 40 Section 3 ENGINE.)



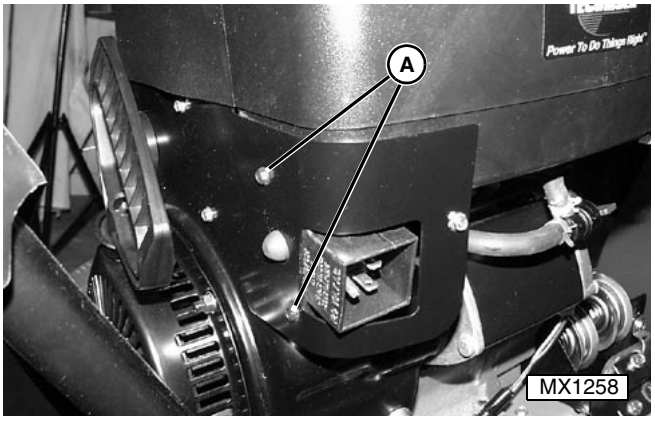
1332DDE Model shown (others similar)

2. Remove cap screws (A) and stator (B).
3. Install stator with wiring harness to the top (C).
4. Install cap screws and torque to **7.5 N•m (70 lb-in.)**.

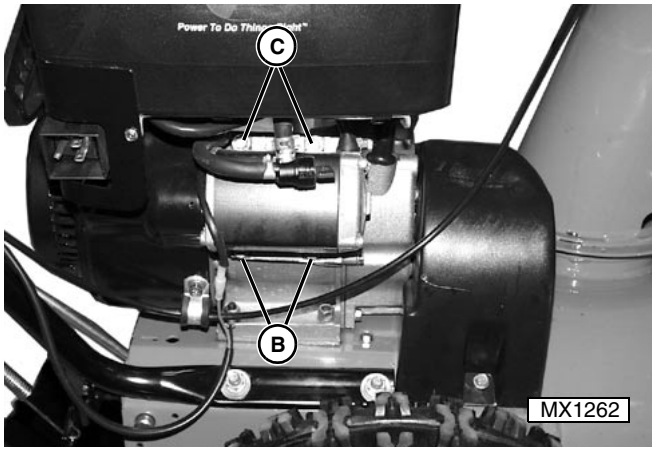
STARTING MOTOR

Removal:

NOTE: If unit is not currently fitted with a 120V electric starting motor and a 120V electric starting motor is being installed for the first time, refer to the installation instructions supplied with the starting motor kit.



1. Remove screws (A) securing start button module.



1128DE Model shown (others similar)

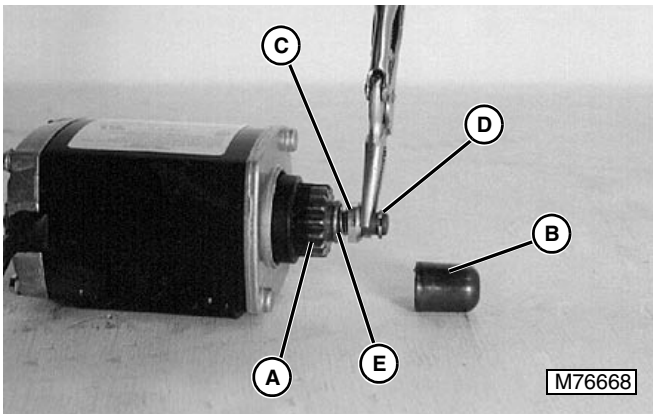
2. Remove two lower cap screws (B) securing starting motor to engine block.
3. Remove two upper cap screws (C). Remove starting motor from engine.
4. Inspect starting motor.

Installation:

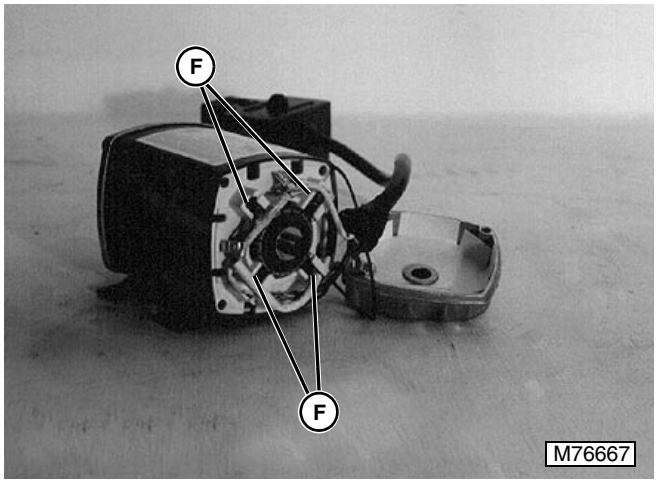
1. Inspect starting motor bracket mounting points for damage.
2. Install two upper cap screws (C) and two lower cap screws (B) securing starting motor to engine block. Tighten all cap screws to **11 N•m (100 lb-in.).**
3. Install two screws securing start button module.

Disassembly:

Remove starting motor from engine. (See Section Above)



1. Inspect pinion gear (A) for wear or broken teeth. If replacement is necessary, remove gear:
- Remove nose (B) from gear assembly.
- Slide spring retainer (C) towards gear and remove C-clip (D). Remove spring retainer (C), spring (E), and gear (A).



2. Remove end cap and inspect brushes (F). Replace brushes if brush wire approaches the bottom of the brush holder slot. Brush springs must be strong enough to keep brushes in contact with commutator.

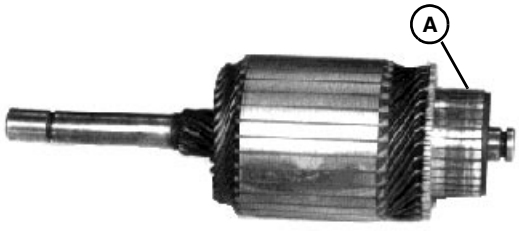
Inspection and Assembly:

NOTE: Test brush holder using an ohmmeter or test light.

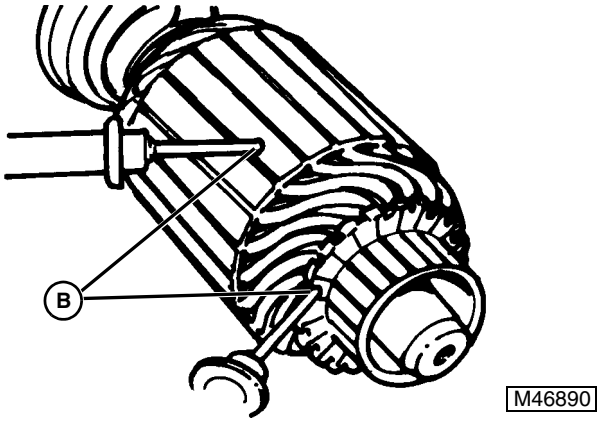
1. Test brush holder: Touch one probe of tester to negative brush holder and other probe to field brush holder. If there is continuity, replace the brush holder.
2. Inspect springs for wear or damage. Replace if necessary.

IMPORTANT: Do not clean armature with solvent. Solvent can damage insulation on windings. Use only mineral spirits and a brush.

3. Inspect armature. Look for signs of dragging against pole shoes.



4. Inspect commutator bars (A). Look for roughness, burned bars, or any material which might cause short circuits between bars. If necessary, clean and touch up with 400 sandpaper. NEVER use emery cloth. Clean all dust from armature when finished. Test for grounded windings using an ohmmeter or test light.
5. Armature windings are connected in parallel, so each commutator bar must be checked.
6. If the test shows continuity, a winding is grounded and the armature must be replaced.
7. Test for open circuits in the windings. If the test shows no continuity, the armature has an open circuit and must be replaced.



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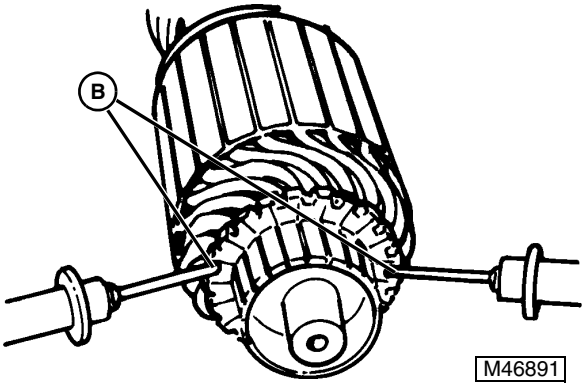


M46891

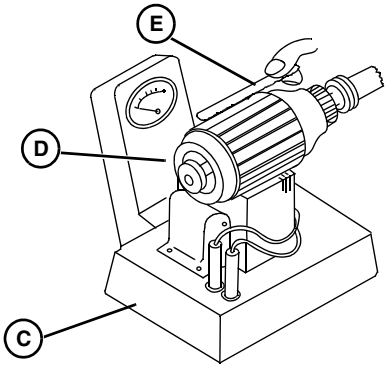
NOTE: Test armature windings using an ohmmeter or test light.

8. Test for grounded windings: Touch probes on one commutator bar and armature shaft. Armature windings are connected in series, so only one commutator bar needs to be checked.

If test shows continuity, a winding is grounded and the armature must be replaced.

9. Test for open circuited windings: Touch probes on two different commutator bars (B).

If test shows no continuity there is an open circuit and the armature must be replaced.

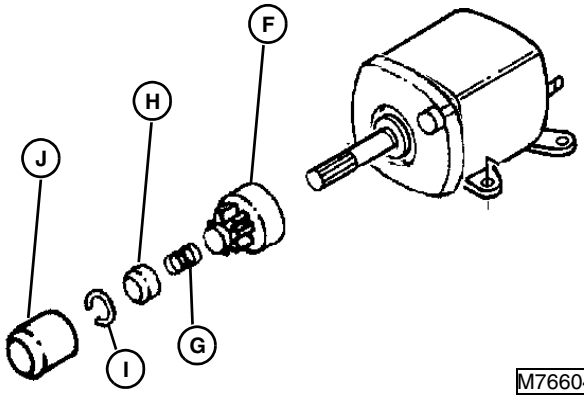


10. Test for short circuited windings using a growler (C). Put armature (D) in a growler and hold a hacksaw blade (E) above each slot while slowly rotating armature.

If coil is shorted, the blade will vibrate on the slot.

NOTE: A short circuit most often occurs because of copper dust or filings between two commutator segments.

11. If test indicates short circuited windings, clean the commutator of dust and filings. Check the armature again. If the test still indicates a short circuit, replace the armature.
12. Assemble starting motor making sure that brush wires are out of way of rotating parts. Tighten assembly bolts to **6 N•m (50 lb-in.)**



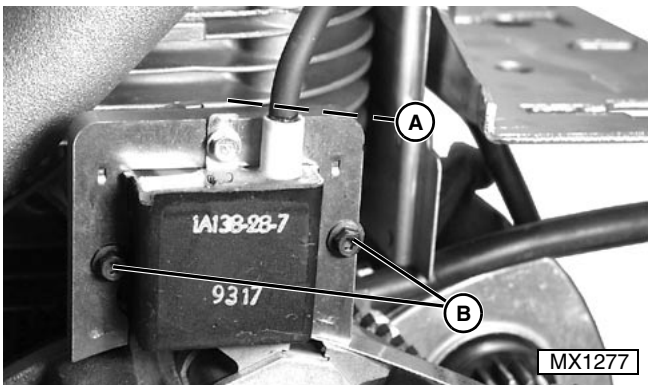
M76604A

13. Assemble gear (F), spring (G), spring retainer (H), c-clip (I) and nose (J)).
14. Install starting motor on engine in reverse order of removal. (See STARTING MOTOR on page 18.)

IGNITION MODULE REMOVAL AND INSTALLATION

Procedure:

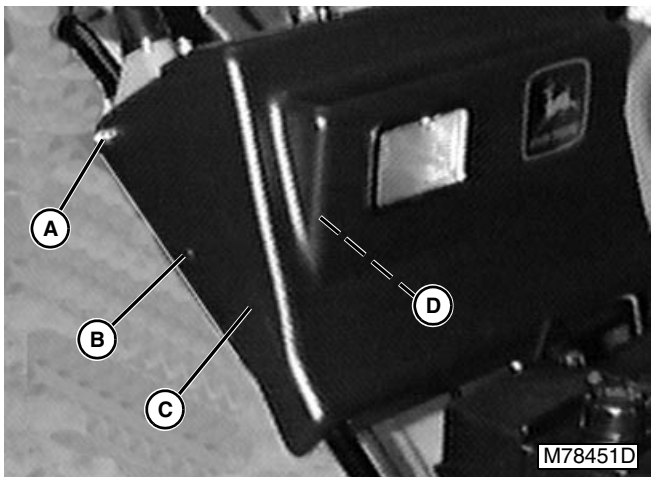
1. Remove blower housing.



2. Disconnect terminal (A).
3. Remove cap screws (B). Remove ignition module.
4. Install new ignition module and set gap. (See IGNITION MODULE AIR GAP ADJUSTMENT on page 14.)

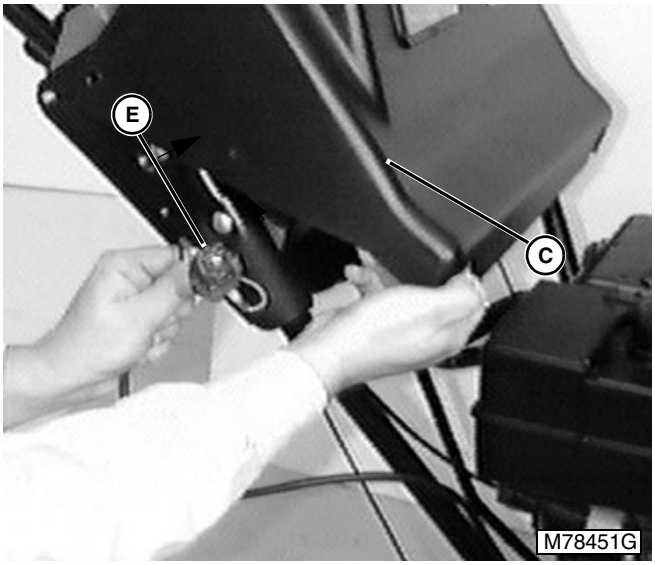
HEADLIGHT REPLACEMENT

Procedure:

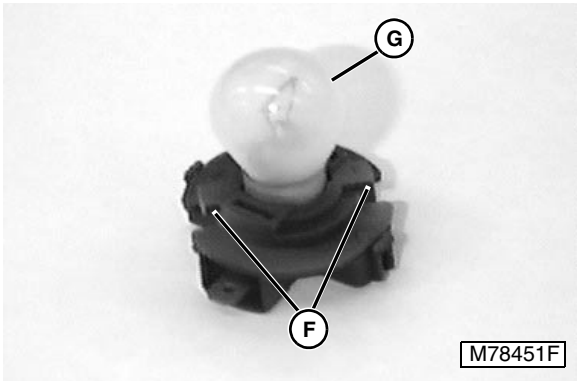


1. Remove two crown nuts (A) and two screws (B) from snowblower cover (C).
2. Slide snowblower cover off of bolts and pull up on cover to access light housing (D).

NOTE: Access to light housing may be easier if the controls of the snowblower are in the neutral position.



3. Slide hand behind snowblower cover (C) and grab hold of light socket (E).



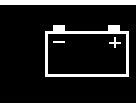
4. Turn light socket until tabs (F) on light socket line up with notches in light housing and remove light socket.
5. Replace defective bulb (G).

NOTE: It is not necessary to disconnect the socket from the wiring harness. It was removed for clarity only.

6. Slide hand behind snowblower cover and insert tabs on light socket into notches of light housing.
7. Push in on light socket and turn either to the left or right to snap socket into place.
8. Put snowblower cover over bolts and push down on front of cover.
9. Install and tighten crown nuts and screws.

NOTE: Overtightening the screws or crown nuts may result in damaged threads.

NOTES:



CONTENTS

Page

SPECIFICATIONS

	924DE	1128DE	1128DDE	1332DDE
TIRES				
Wheels	Steel	Steel	Steel	Steel
Tires	Pneumatic - Snow Hog	Pneumatic - Snow Hog	Pneumatic - Snow Hog	Pneumatic - Snow Hog
Tire size	4.80 - 8	4.80 - 8	4.80 - 8	16 x 6.50 - 8
FRICTION DRIVE SYSTEM				
Drive components	Primary reduction–V-belt from engine to transmission. Transmission–spring loaded friction disk driven from aluminum input disk. Gear reduction to axle shaft.			

LUBRICATION SPECIFICATIONS

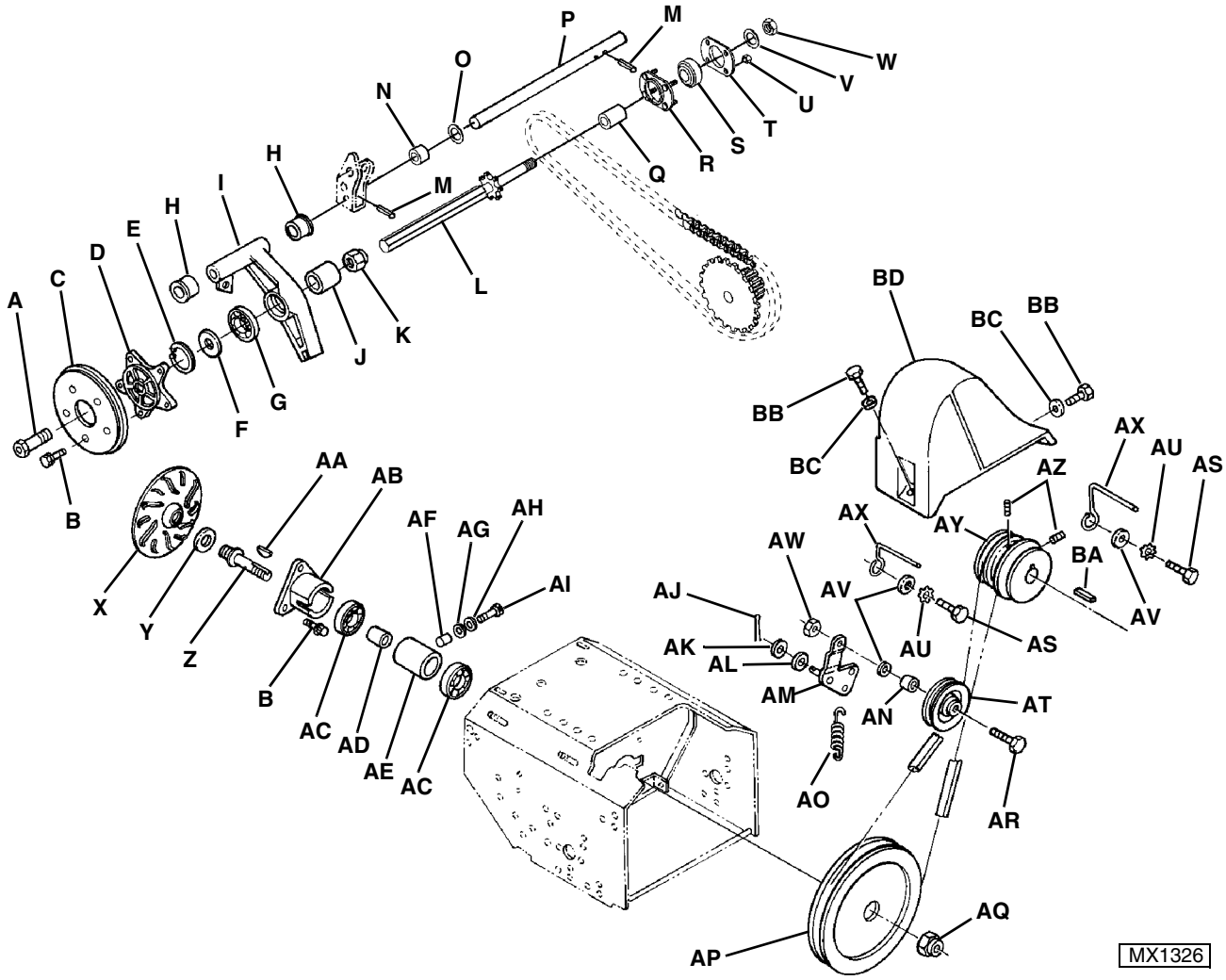
Friction Disk Bearing Carrier . . . . . John Deere Never-Seez®—PT5606 OR PT569
Hex Drive Shaft . . . . . John Deere Never-Seez®—PT5606 OR PT569

TORQUE SPECIFICATIONS

Tension Idler Nuts . . . . . 20 N•m (180 lb-in.)
Wheel Cap Screws (1128DDE and 1332DDE) . . . . . 67 N•m (50 lb-ft)
Bearing Carrier Nuts . . . . . 4.7 N•m (40 lb-in.)
Friction Disk Cap Screws . . . . . 12 N•m (106 lb-in.)
Friction Disk Hollow Bolt. . . . . 150 N•m (110 lb-ft)
Friction Plate Bearing Carrier Screws . . . . . 12 N•m (106 lb-in.)
Friction Plate Cap Screws . . . . . 12 N•m (106 lb-in.)
Auger Clutch Assembly Cap Screws . . . . . 12 N•m (106 lb-in.)

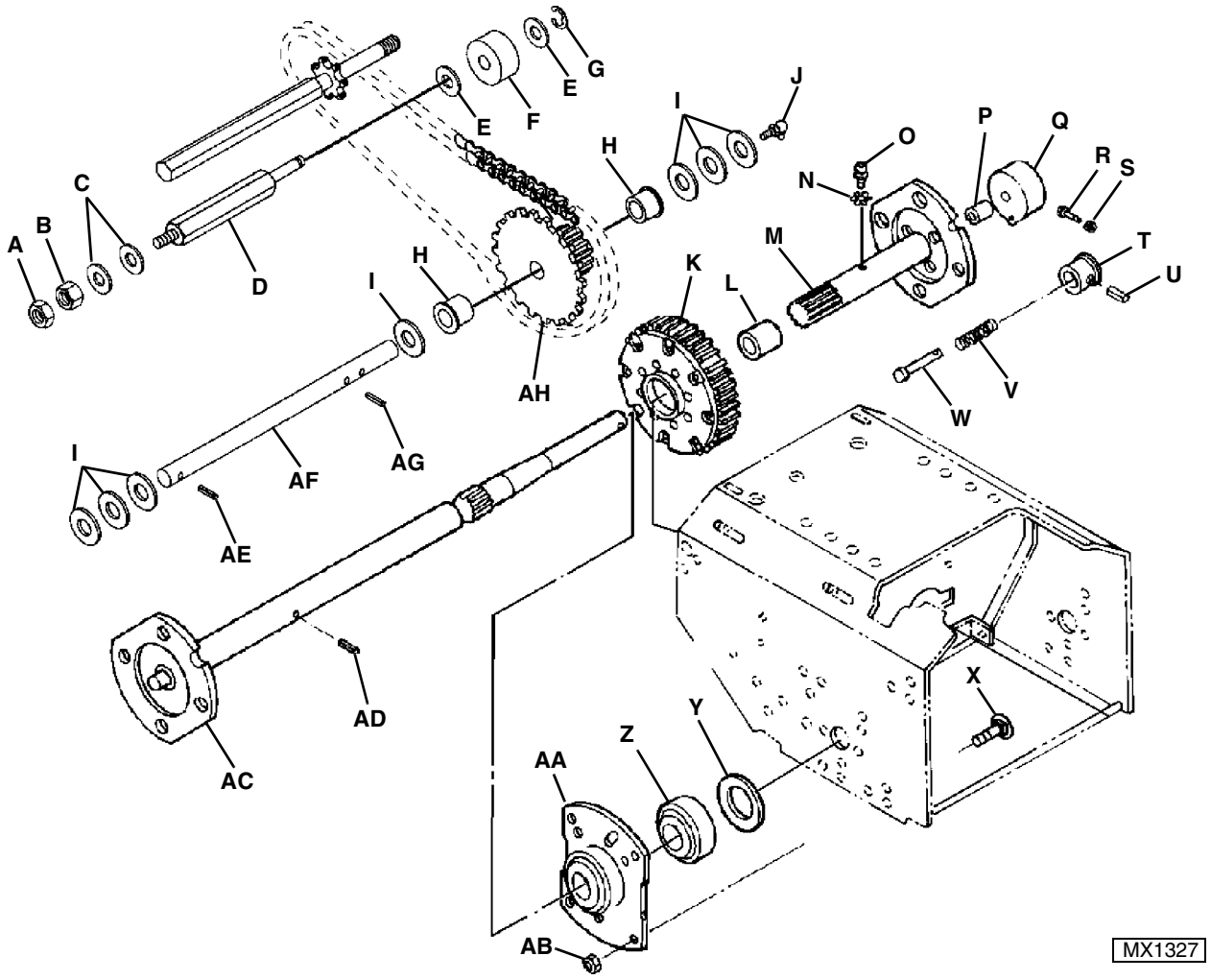
COMPONENT LOCATION

PRIMARY DRIVE —ALL MODELS



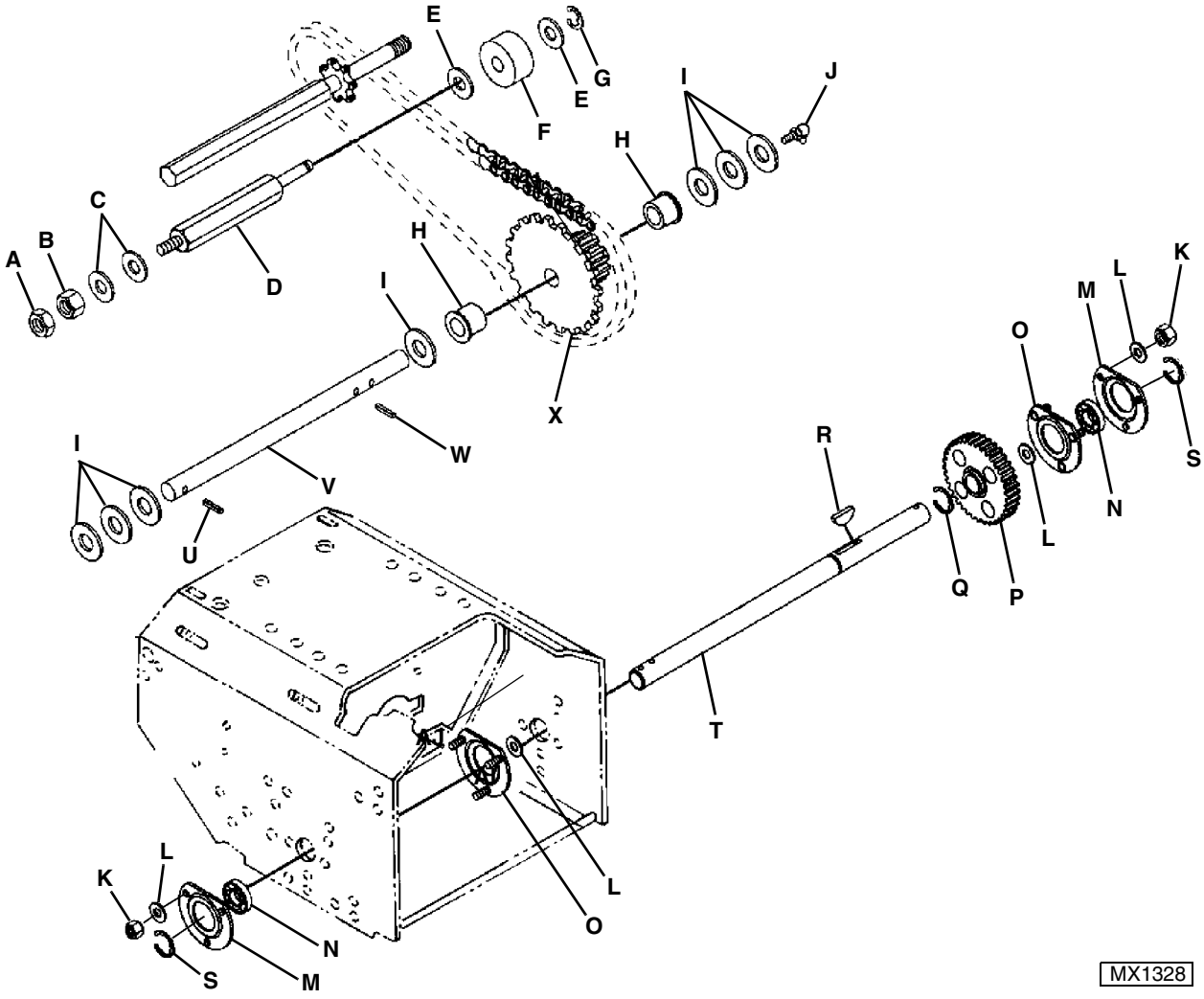
A. Hollow Bolt	O. Washer	AC. Bearing	AQ. Lock Nut
B. Cap Screw	P. Shaft	AD. Spacer	AR. Cap Screw
C. Friction Disk	Q. Spacer	AE. Housing	AS. Cap Screw
D. Hub	R. Inner Flange	AF. Spacer	AT. Idler
E. Snap Ring	S. Bearing	AG. Roller	AU. Lock Washer
F. Washer	T. Outer Flange	AH. Washer	AV. Washer
G. Bearing	U. Nut	AI. Set Screw	AW. Nut
H. Bushing	V. Washer	AJ. Cotter Pin	AX. Belt Keeper
I. Arm	W. Nut	AK. Spring Washer	AY. Drive Sheave
J. Bushing	X. Friction Plate	AL. Washer	AZ. Set Screw
K. Nut	Y. Washer	AM. Bracket	BA. Key
L. Hex Shaft	Z. Shaft	AN. Spacer	BB. Cap Screw
M. Roll Pin	AA. Key	AO. Spring	BC. Washer
N. Spacer	AB. Hub	AP. Sheave	BD. Belt Cover

SECONDARY DRIVE—1128DDE and 1332DDE



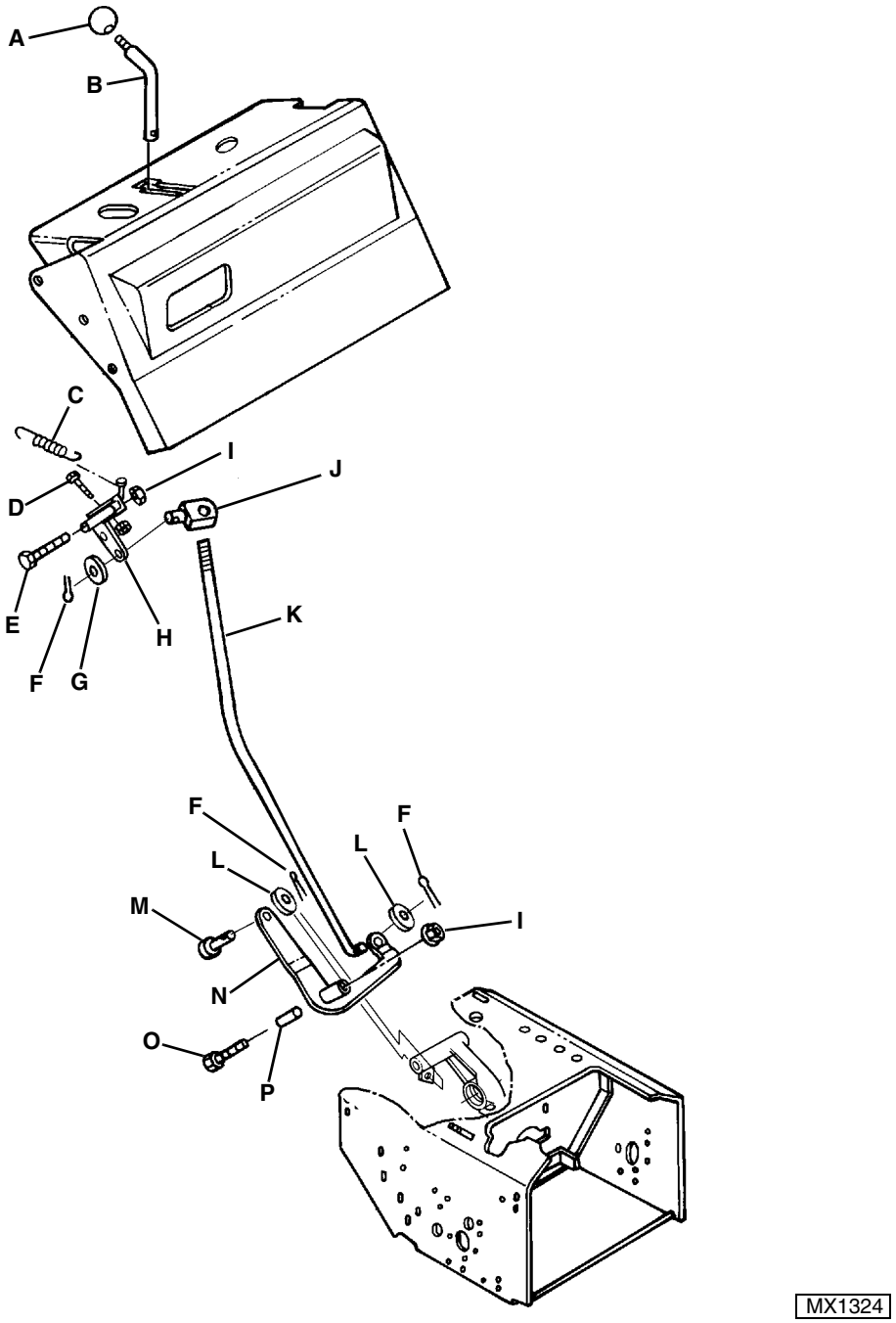
A. Jam Nut
B. Nut
C. Washer
D. Hex Shaft
E. Washer
F. Idler
G. Retaining Ring
H. Bushing
I. Washer
J. Grease Fitting
K. Gear
L. Bushing
M. Left Axle
N. Lock Washer
O. Grease Fitting
P. Bushing
Q. Differential Lock
R. Cap Screw
S. Lock Nut
T. Knob
U. Roll Pin
V. Spring
W. Pin
X. Bolt
Y. Washer
Z. Bearing
AA. Bearing Plate
AB. Lock Nut
AC. Right Axle
AD. Spring Pin
AE. Roll Pin
AF. Pinion Shaft
AG. Roll Pin
AH. Pinion and Sprocket

SECONDARY DRIVE—924DE and 1128DE



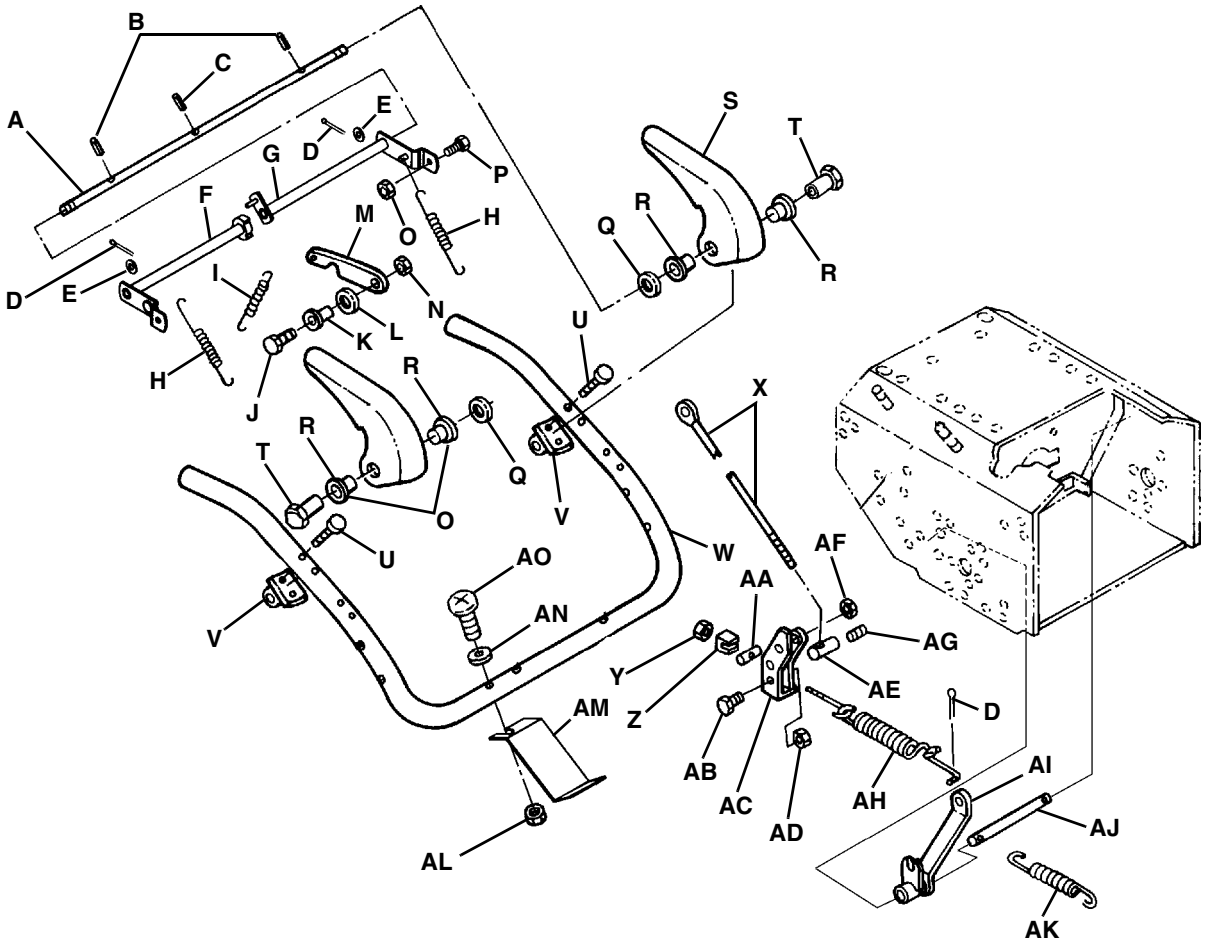
A. Jam Nut	G. Retaining Ring	M. Bearing Flange (outer)	S. E-Clip
B. Nut	H. Bushing	N. Ball Bearing	T. Axle Shaft
C. Washer	I. Washer	O. Bearing Flange (inner)	U. Roll Pin
D. Hex Shaft	J. Grease Fitting	P. Gear	V. Pinion Shaft
E. Washer	K. Nut	Q. E-Clip	W. Roll Pin
F. Idler	L. Washer	R. Key	X. Pinion and Sprocket

SPEED CONTROLS



A. Knob	E. Cap Screw	I. Lock Nut	M. Pin
B. Lever	F. Cotter Pin	J. Pivot End	N. Arm
C. Spring	G. Washer	K. Rod	O. Cap Screw
D. Cap Screw	H. Pivot	L. Washer	P. Bushing

CLUTCH CONTROLS



MX1332

A. Rod
B. Spring Pin
C. Spring Pin
D. Cotter Pin
E. Washer
F. Lever
G. Lever
H. Spring
I. Extension Spring
J. Cap Screw
K. Bushing
L. Washer
M. Arm
N. Nut
O. Lock Nut
P. Cap Screw
Q. Washer
R. Bushing
S. Handle
T. Nut
U. Screw
V. Bracket
W. Handlebar
X. Cable
Y. Lock Nut
Z. Adapter
AA. Pin
AB. Cap Screw
AC. Yoke
AD. Lock Nut
AE. Shifter Rod
AF. Spacer
AG. Set Screw
AH. Spring
AI. Fork
AJ. Rod
AK. Spring
AL. Nut
AM. Bracket
AN. Washer
AO. Screw

THEORY OF OPERATION

FRICTION DRIVE SYSTEM

The friction drive system transfers power from the engine crankshaft to the drive wheels by way of a friction plate/friction disk drive system.

The double pulley attached to the engine crankshaft powers both the friction drive system and the auger drive. The friction drive is powered by the inside belt, the auger drive is powered by the outside belt.

Power runs from the engine through the drive belt to the drive sheave. A spring-loaded idler keeps tension on the belt. The drive sheave is connected by a short drive shaft to the friction plate. The friction plate rotates whenever the engine is running.

When the friction disk bracket pivots, the rubber edged friction disk moves into contact with the rotating friction plate.

Rotation is transferred to a hex shaft by way of chain and sprocket. Power is then transferred to the differential, by way of the differential sprocket. The differential transfers power to the drive wheels through left and right axle shafts.

Speed and direction of travel are determined by the point of contact between friction plate and friction disk. The direction will be forward if the point of contact is to the right of center on the friction plate, and in reverse if the contact is to the left of center. Speed selection must be made with the drive disengaged. Forcing the friction disk to move across the face of the friction plate with the drive engaged will scuff the rubber surface of the disk, greatly shortening the life of the disk.

Speed of the drive system increases the farther from center the friction disk contacts the friction plate.

The drive is engaged when the operator pushes down on the lever, which causes the friction disk pivot rod to move. Movement of the pivot rod causes the friction drive bracket to rotate, which swings the friction disk into contact with the friction plate.

The drive is disengaged when the lever is released, and the drive disengagement spring pulls the friction disk pivot rod back. The pivot rod rotates the friction drive bracket and moves the friction disk out of contact with the friction plate.

The drive interlock mechanism keeps the friction drive system engaged, provided the auger engagement control is also engaged. A pin meshes with a drive interlock clip whenever the drive engagement lever is held to the handle. When the auger control is released, the pin is free to disengage from the interlock clip.

The drive linkage is adjusted to proper tension by moving the adjuster nut located inside the spring.

DIFFERENTIAL LOCK—1128DDE and 1332DDE

The differential lock mechanism allows the operator to lock the rotation at the left side drive wheel. Applying the differential lock improves traction by coupling both wheels together. Disengagement of the differential lock allows differential action, where the wheels are independent of one another, making the machine easier to maneuver.

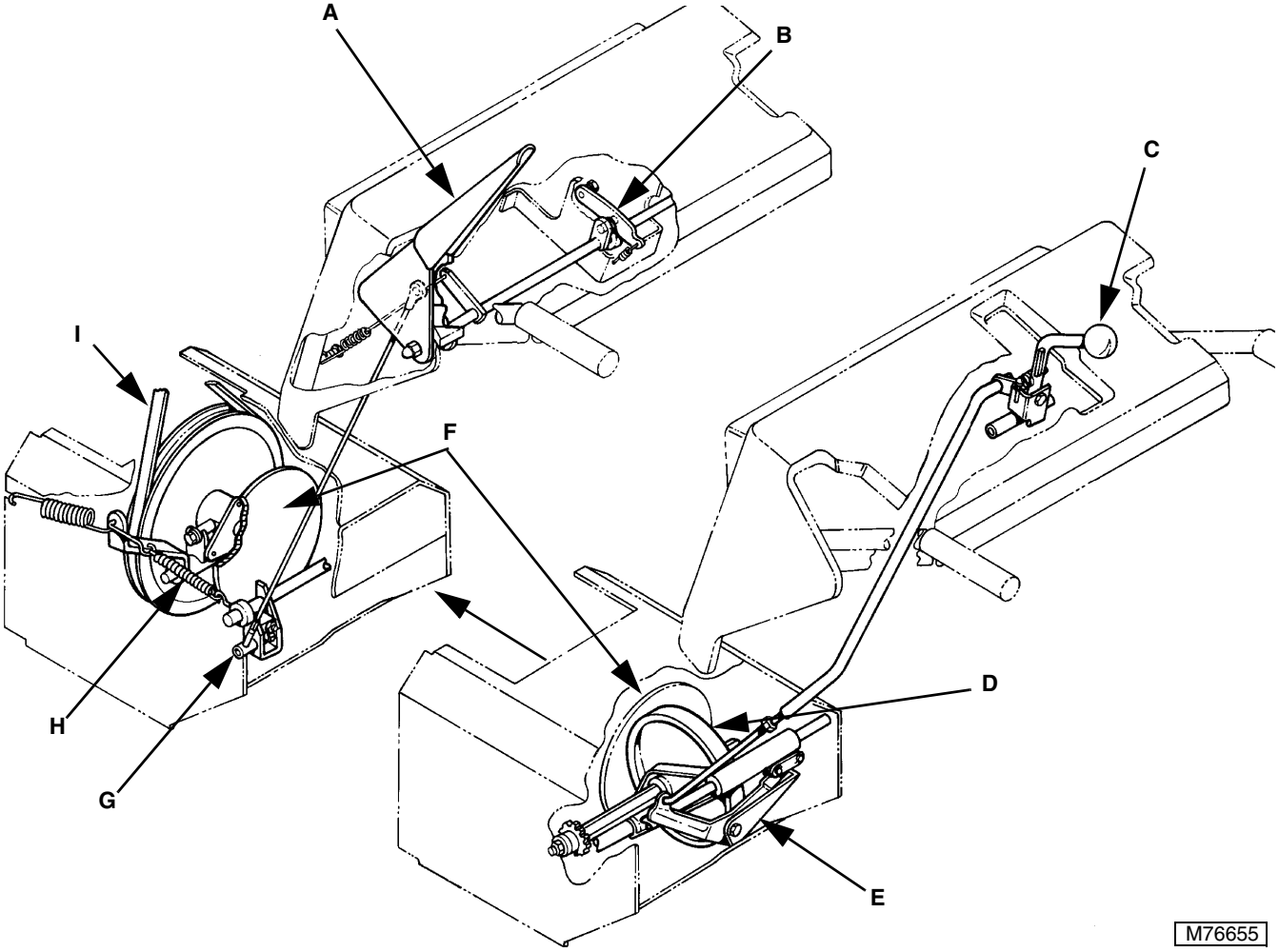
Differential rotation provides drive to left and right axles. A cross axle shaft runs the full width of the snowblower, through the center of the left and right axles, and through the differential. The right-side axle is through-bolted and pinned to the cross axle shaft, so the cross axle shaft rotates with the right-side axle.

Differential “lock” is applied by locking the left-side axle to the cross shaft. This is accomplished by turning the locking knob a quarter turn so the lock pin falls into the mating lock in the flange mounted to the cross axle shaft. The rotation of right and left axles is then tied together.

TROUBLESHOOTING

Problem or Symptom / Check or Solution	Unit will not move forward or	Unit will not push into snow	One wheel spins, the other	Unit creeps forward or backwards when in neutral.	Unit difficult to maneuver/tun	Auger will not rotate
Broken or loose drive belt	●	●				
Clutch out of adjustment	●	●		●		
Broken or loose auger belt						●
Differential lockout not engaged (1128DDE and 1332DDE)		●	●			
Differential lockout engaged (1128DDE and 1332DDE)					●	
Broken chain	●					
Broken teeth on axle shaft gear	●					
Shift linkage out of adjustment				●		

POWER TRAIN COMPONENTS



A. Drive Engagement Lever
B. Drive Interlock
C. Speed Control Lever
D. Friction Disk
E. Friction Disk Pivot
F. Friction Plate
G. Adjuster
H. Spring
I. Drive Belt

TESTS AND ADJUSTMENTS

FRICTION DRIVE CLUTCH ADJUSTMENT

Reason:

Adjust friction clutch to compensate for wear of friction disk when slippage occurs.

Procedure:

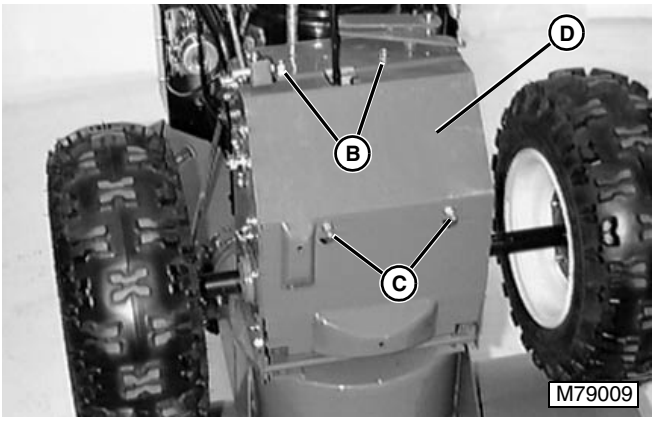
1. Safely park snowblower. Place snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop and remove wire from spark plug to prevent accidental starting.

⚠ CAUTION

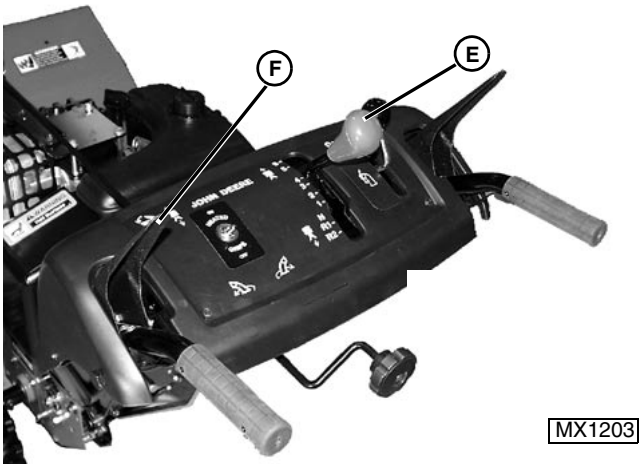
Remove enough fuel from fuel tank so that no spillage will occur when unit is tipped up onto housing. Gasoline is extremely flammable. DO NOT SMOKE. Always work in a well ventilated area away from open flame or spark producing equipment.

1332DDE Model Shown (other models similar)

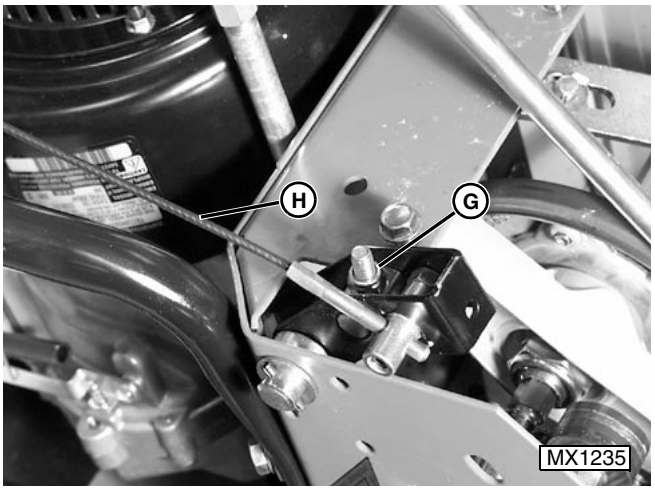
2. Tip machine forward onto auger housing (A).



3. Remove two upper bolts (B) and loosen two lower bolts (C) to remove access panel (D).



4. Put speed selector lever (E) in “1” (First speed).
5. Make sure friction clutch lever (F) is disengaged.



6. Turn drive wheels by hand. Tighten adjustment lock nut (G) until wheels begin to drag.

7. Engage and release friction clutch lever to align clutch linkage.
8. Repeat procedure as necessary.
9. When wheel drag is obtained with linkage alignment, loosen adjustment lock nut three full turns. Drive wheels will then turn freely.

*NOTE: Insure that clutch cable (H) is slack when clutch lever is disengaged. Clutch lever should move approximately **13 mm (0.5 in.)** before clutch mechanism is activated.*

10. Engage clutch lever and check to make sure that friction disk engages friction plate.
11. Replace cover. Tilt machine back onto wheels and reconnect spark plug.

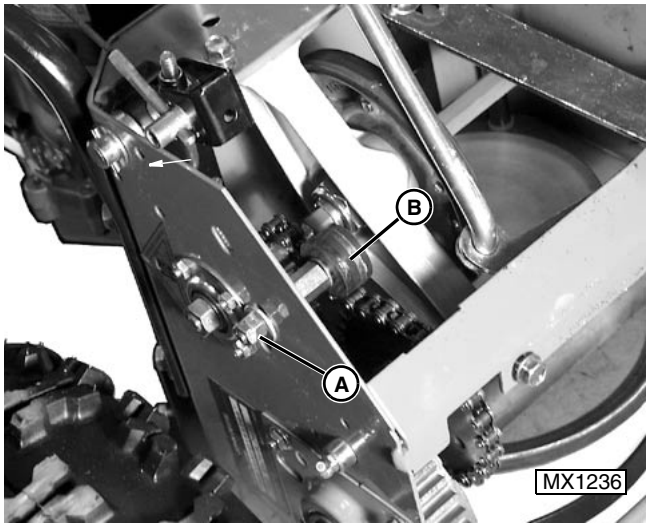
DRIVE CHAIN ADJUSTMENT

Reason:

To adjust drive chain so premature failure or breakage of chain does not occur.

Procedure:

1. Park snowblower on a hard, smooth surface, tip machine onto auger housing, and remove access panel. (See “FRICTION DRIVE CLUTCH ADJUSTMENT” on page11 for procedure.)
2. Drive chain should be taut with little or no play.



3. To adjust chain tightness, loosen nuts (A) and move tension idler (B) up or down equally in slot as necessary.
4. Tighten nuts to **20 N•m (180 lb-in.)**.
5. Install access panel.

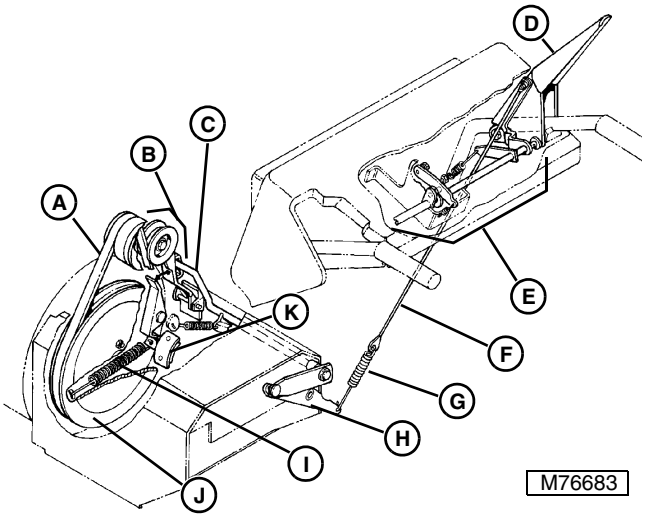
DRIVE CONTROL LINKAGE

Reason:

To check drive control linkage or spring for defects resulting in poor performance.

Procedure:

Use the diagram below as a reference for component location. The drive control linkage has no adjustments. If the unit is not operating correctly, i.e. not enough belt tension, replace the spring and check the linkage and assembly, or idler assembly.



A. Drive Belt	G. Spring
B. Idler	H. Linkage
C. Arm	I. Brake Spring
D. Handle	J. Driven Sheave
E. Interlock	K. Brake
F. Cable	

For brake adjustment: (See “IMPELLER BRAKE ADJUSTMENT” on page 10 of MISCELLANEOUS SECTION.)

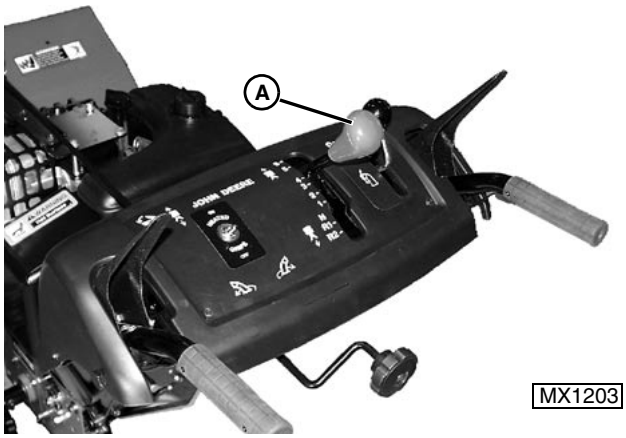
SPEED / SHIFT LINKAGE ADJUSTMENT

Reason:

To adjust speed/shift control linkage to eliminate creeping and lack of movement of snowblower.

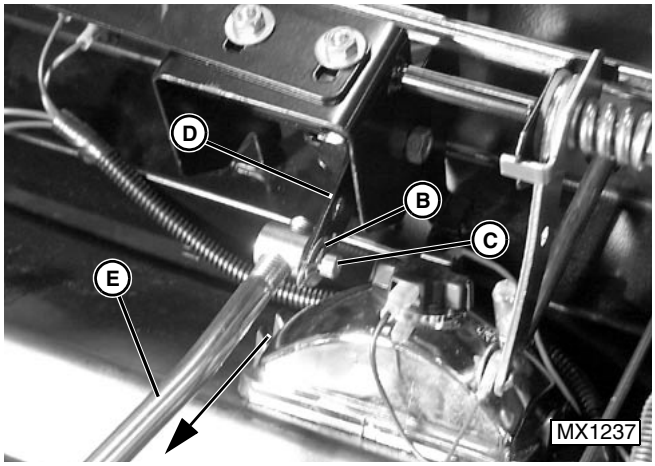
Procedure:

1. Park snowblower on a hard, smooth surface, tip machine onto auger housing, and remove access panel. (See “FRICTION DRIVE CLUTCH ADJUSTMENT” on page11 for procedure.)

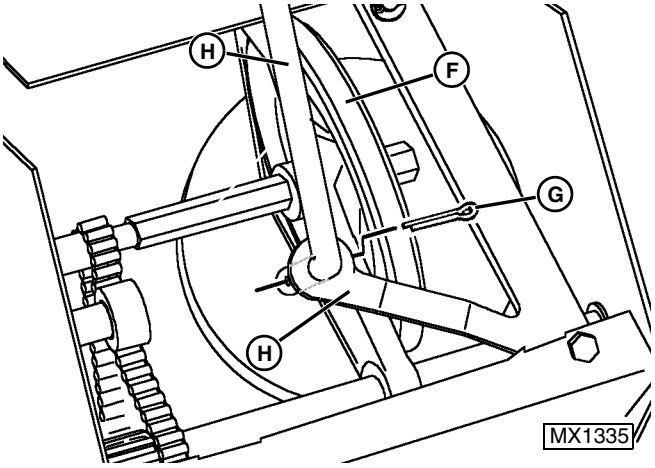


1332DDE Model shown (other models similar)

2. Move shift lever (A) to the “6” (6th speed) position.

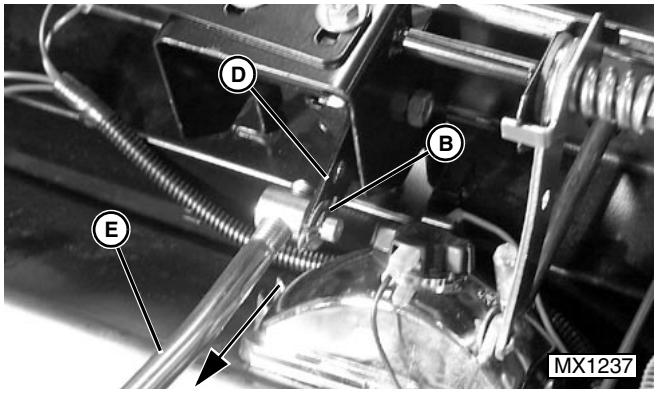


3. Remove washer and quick pull pin (B) to remove adjustment stud (C) from shift lever linkage (D).
4. Push shift rod (E) down into drive housing as far as it will go and hold it in this position while rod adjustment is made in the following steps.



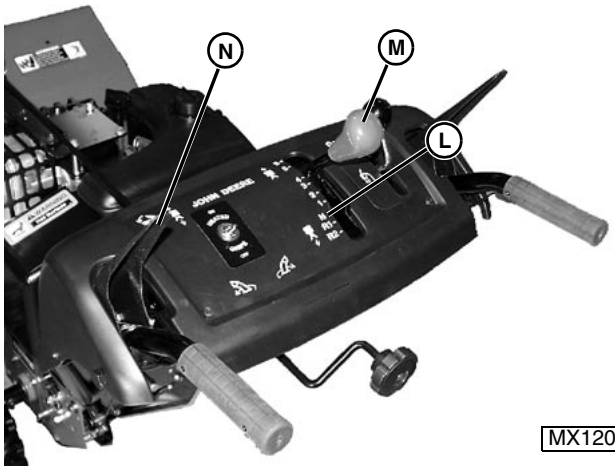
IMPORTANT: To prevent damage to friction wheel rubber (F), install washer and cotter pin (G) so open end points away from friction wheel rubber. This will prevent open end from gouging the rubber.

5. Check that cotter pin (G) is installed with open end away from friction wheel rubber (F). If not, change it to correct position shown once adjustment is complete.
6. Push on friction wheel to ensure all slack is taken out of linkage (H). Hold this position.



IMPORTANT: To prevent damage to headlight housing, install quick pull pin (B) so open end points up toward operator’s station.

7. Turn adjustment stud on top end of shift rod (E) to align with shift lever linkage (D), then fasten with washer and quick pull pin (B) as shown.



1332DDE Model shown

NOTE: The neutral position (L) ("N") of the speed selector lever (M) can be anywhere between "R1" and the first forward speed ("1").

With speed selector lever in Neutral ("N") and the friction drive lever (N) engaged, the unit should not "creep" forward or backward.

8. Return unit to its upright operating position.
9. Start engine and check for proper operation of the speed selector lever:
   - put speed selector lever in Neutral ("N"),
   - move friction drive lever to engaged position,

Results:

- unit should not "creep" forward or backward.
- If necessary, repeat steps one to nine to eliminate any neutral creep.

10. Install access panel.

REPAIR

V-BELTS

V-belts transmit power by friction and a wedging action against the sheaves. Belts are subject to wear through periodic heavy load and should be checked often to be certain belt wear is normal. All belts and sheaves wear with use. Normal wear can be recognized as even wear–both on the belt and sides of the sheave.

A slight raveling of the belt covering does not indicate premature failure. Cut off the raveling if the covering peels at the lap. Check for the causes of unusual belt wear.

Lumpy V-belts can cause vibration. Check belts for swells and lumps. Install only recommended V-belts of the proper length.

SHEAVES

Examine sheaves for bent or chipped sidewalls. Check also for excessive sidewall wear. Damaged sheaves cause rapid belt wear. A bent sheave reduces the gripping power of the belt. Replace sheaves having any of the above defects.

Check to be sure dirt has not lodged and packed in sheave V-groove. Loosen dirt so it will fallout when machine is started.

PULLEY ALIGNMENT AND DRIVE BELT TENSION

Misaligned sheaves will result in shorter belt life. Use a straightedge to check sheave alignment.

More belts fail from under-tension than over-tension. Loose belts slip, heat and burn, causing premature failure.

Replace weak or stretched idler springs if belt drives are so equipped.

Excessive belt tension stretches and weakens belts. It also puts an excessive load on shaft bearing.

Adjust belts to tension specified in operator's manual for each machine.

DRIVE BELT CLEANING

⚠ CAUTION

DO NOT attempt to clean the belts while machine is running.

Clean belts by wiping them with a clean cloth. Immediately wipe off any spilled oil or grease. Do not use solvents because they will soften the belt and cause the clutch to grab.

Do not use belt dressings. Dressings often give only temporary gripping action, while softening the belt and causing eventual deterioration, and shorter belt life. Dressings also will cause the clutch to grab.

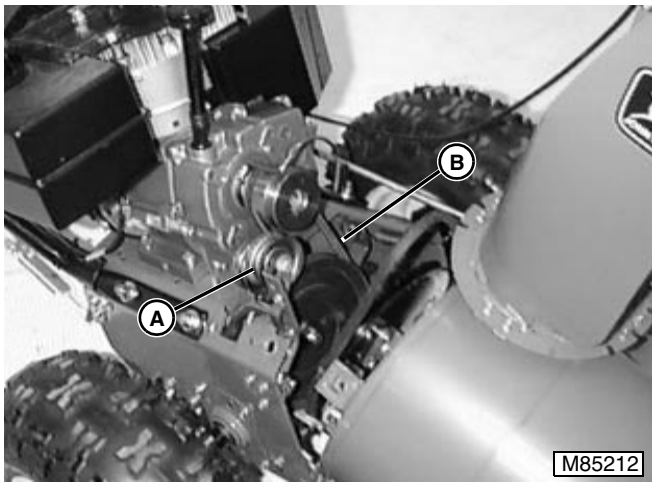
Loosen tension as much as possible when removing and replacing V-belts. Check alignment and condition of sheaves as outlined above. Place belt in the sheave groove by hand.

IMPORTANT: Never pry belt over edge of sheave because this may rupture belt cords and shorten belt life.

FRICTION DRIVE BELT REPLACEMENT

Procedure:

1. Remove auger drive belt. (See “AUGER DRIVE BELT REPLACEMENT” on page 17 of MISCELLANEOUS SECTION.)

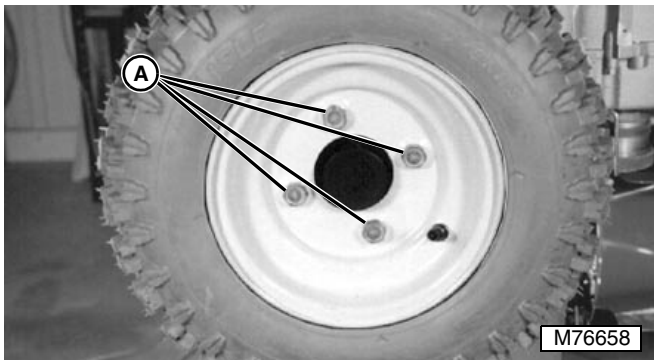


2. Pull back spring loaded idler (A) and remove friction drive belt (B) from engine drive sheave. Install new belt.
3. Install auger drive belt.
4. Reassemble to specification.

WHEEL REPLACEMENT

1128DDE and 1332DDE—

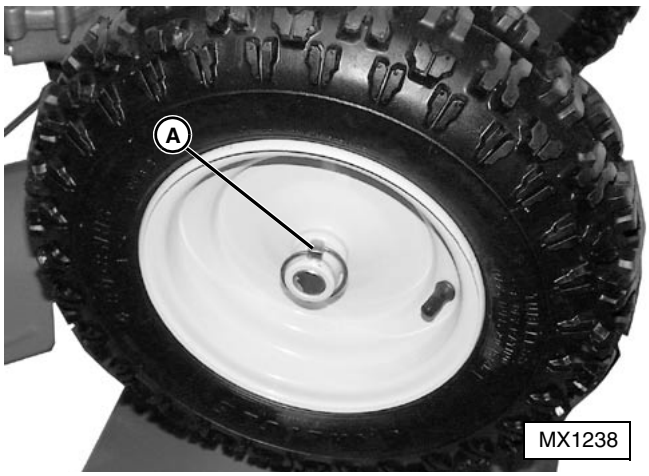
1. Park snowblower on a hard, smooth surface, remove wire from spark plug, and tip machine onto auger housing. (See “FRICTION DRIVE CLUTCH ADJUSTMENT” on page11 for procedure.)



2. Remove cap screws (A) securing wheel.
3. Replace wheel and secure with four cap screws. Tighten to **67 N•m (50 lb-ft).**
4. Tilt unit back on wheels.
5. Reconnect spark plug. Check engine oil.

924DE and 1128DE—

1. Park snowblower on a hard, smooth surface, remove wire from spark plug, and tip machine onto auger housing. (See “FRICTION DRIVE CLUTCH ADJUSTMENT” on page11 for procedure.)



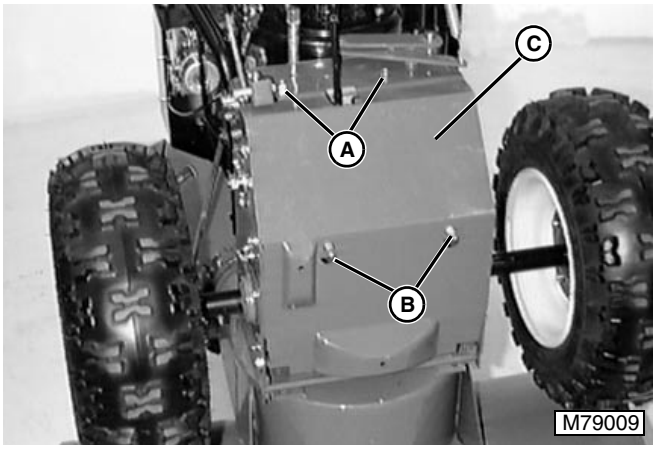
2. Remove quick-lock pin (A).
3. Replace wheel, and replace quick-lock pin.
4. Tilt unit back on wheels.
5. Reconnect spark plug. Check engine oil.

AXLE

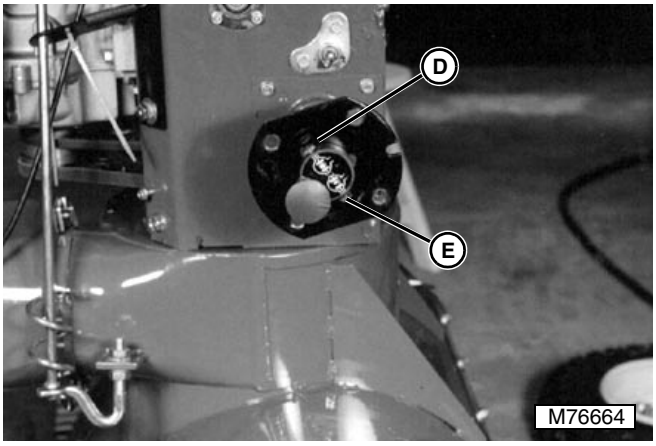
Removal:

1128DDE and 1332DDE—

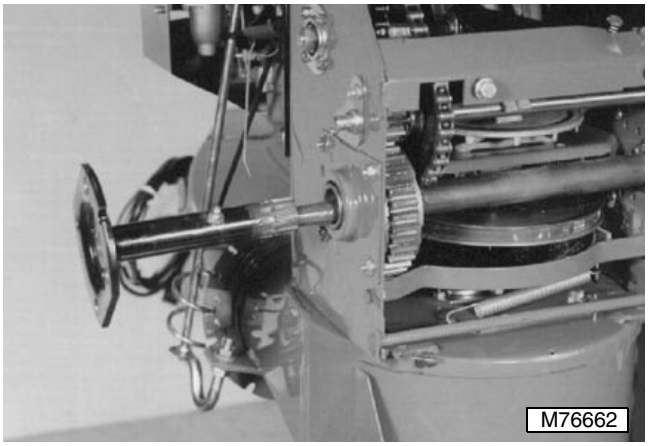
1. Remove wheels. (See “WHEEL REPLACEMENT” on page15.)



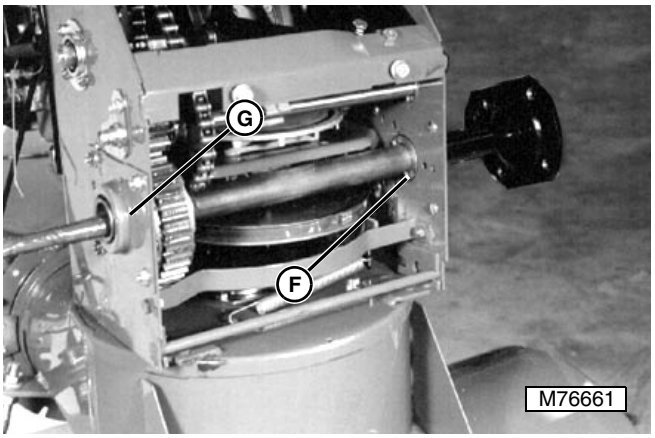
2. Remove two upper bolts (A) and loosen two lower bolts (B) to remove access panel (C).



3. Remove nylock nut (D) and cap screw (E) securing axle lock mechanism to left axle hub.



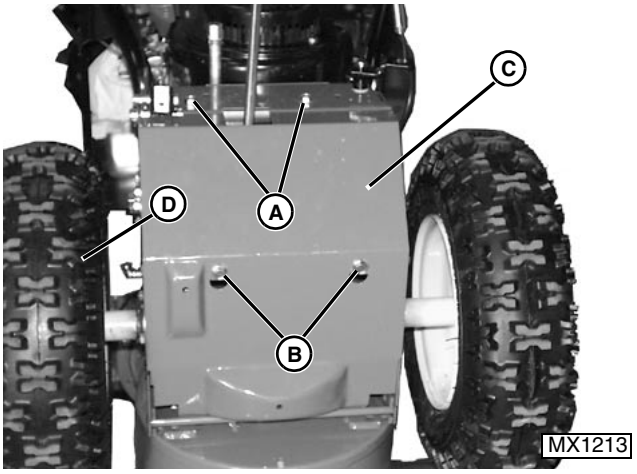
4. Slide left axle from differential.



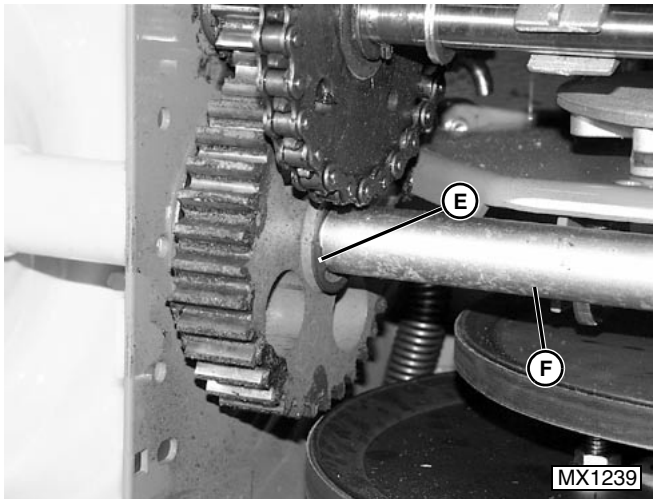
5. Remove spring pin (F) from right axle.
6. When removing right axle, take care that differential does not fall from unit.
7. Remove right axle.
8. Inspect axle shaft bearing surfaces and splines. Inspect axle for straightness. Replace worn or damaged components.
9. Axle bearings can be replaced by removing bearing carrier (G).
   - Remove four nuts and washers securing bearing carrier to frame.
   - Remove bearing from bearing carrier with appropriate bearing driver. Replace bearing.

924DE and 1128DE—

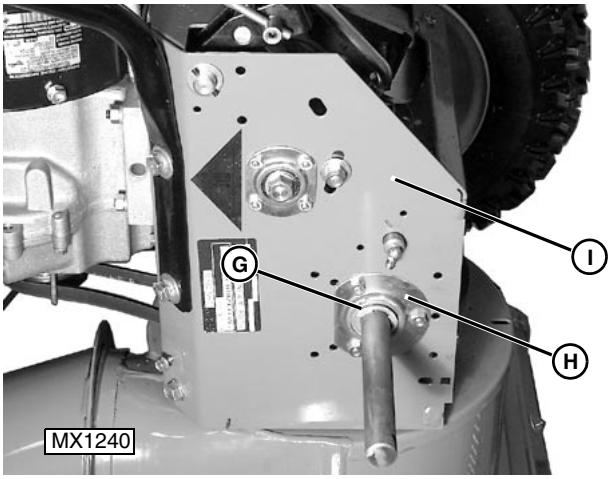
1. Remove wheels. (See “WHEEL REPLACEMENT” on page15.)



2. Remove two upper bolts (A), and loosen two lower bolts (B).
3. Remove access panel (C) and left wheel (D).



4. Remove E-Clip (E) from axle shaft (F).



5. Remove the left side E-Clip (G), bearing carrier and axle bearing (H) from the gear case (I).
6. Pull the axle shaft out through the right side of the machine, removing it from the gear. Support the gear to prevent damage during axle removal.

NOTE: It may be necessary to tap the axle in order to disengage the axle from the gear. Use care to avoid damaging the ends of the axle shaft.

7. Inspect the axle bearing surfaces and wheel pin holes. Inspect the axle for straightness and wear. Replace the axle if worn or damaged.
8. Remove the right axle bearing from the gear case. Inspect both bearings and replace if unserviceable.

Installation:

1128DDE and 1332DDE—

1. Install right side axle:
   - Grease axle gear surfaces and extension liberally.
   - Install axle through bearing carrier.
   - Install axle into differential. Insure that there is a washer between the differential and left axle bearing. Rotate axle, if necessary, to align flats on axle end with flat surfaces on differential bore.
   - Install spring pin in right hand axle, near bearing.
2. Install left side axle:
   - Slide left axle over projecting shaft from right axle, through bearing and into differential.
   - Install bearing carriers, and secure with four washers and nuts. Tighten to **4.7 N•m (40 lb-in.).**
   - Install differential lock and secure with cap screw and nut. Tighten to **4.7 N•m (40 lb-in.)**.
3. Install wheels. (See “WHEEL REPLACEMENT” on page 15.)
4. Tip the unit back onto wheels. Check oil and fuel levels.
5. Connect the spark plug lead.

924DE and 1128DE—

1. Insert the axle through the right side of the gear case, through the axle gear and into the left side axle bearing.
2. Install the key and E-Clip holding axle gear in place on the axle shaft.
3. Install bearing carriers, and secure with three washers and nuts. Tighten to **4.7 N•m (40 lb-in.)**
4. Install remaining two E-Clips on both sides of axle.
5. Replace the access panel.
6. Install wheels. (See “WHEEL REPLACEMENT” on page 15.)
7. Tip the unit back onto wheels. Check oil and fuel levels.
8. Connect the spark plug lead.

DIFFERENTIAL

Removal:

1. Remove axles. (See “AXLE” on page16.)
2. Remove pinion shaft. (See “PINION SHAFT” on page 18.)
3. Lift pinion assembly to clear differential and remove differential assembly.
4. Inspect differential.

NOTE: Differential components are not serviceable. If unit is worn or damaged entire differential must be replaced.

5. Inspect differential housing for wear at bearing surfaces.
6. Inspect gears for cracked, worn or broken teeth.
7. Replace differential unit if worn or damaged.

Installation:

1. Install differential with washer between differential and axle bearing.

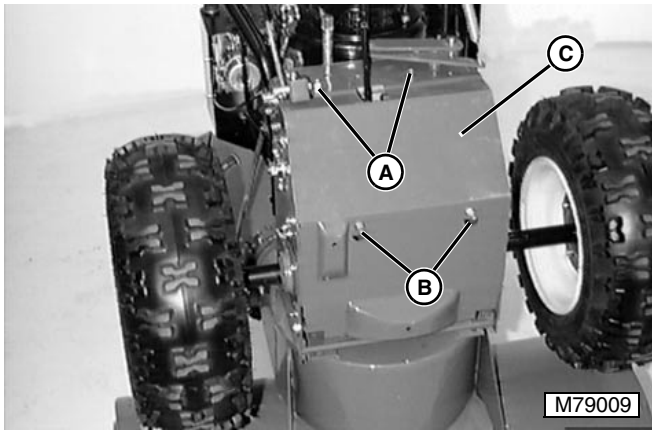
NOTE: Differential unit is non-directional and may be installed either way.

2. Install axles. (See “AXLE” on page 16.)

PINION SHAFT

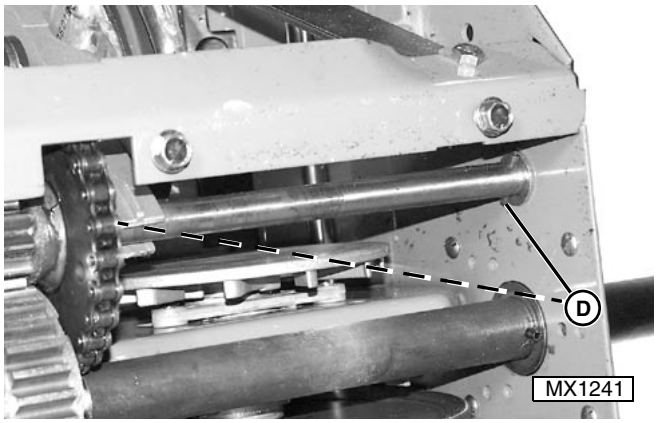
Removal:

1. Remove wheels. (See “WHEEL REPLACEMENT” on page15.)



1332DDE Model shown

2. Remove two upper bolts (A), and loosen two lower bolts (B).
3. Remove access panel (C).



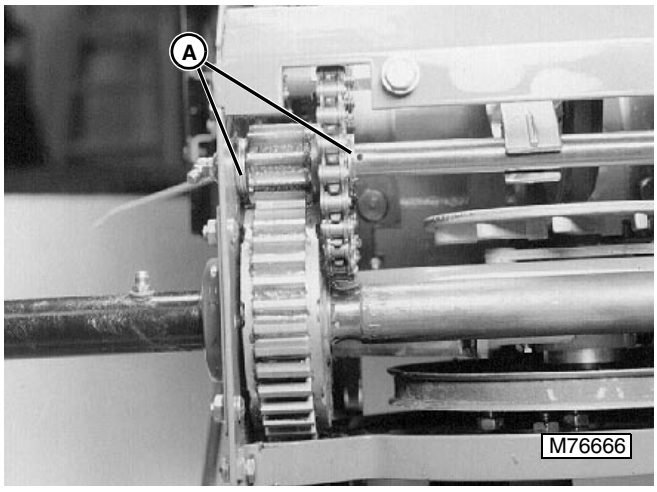
4. Remove two spring pins (D) from pinion shaft.

NOTE: Do not remove grease fitting from end of pinion shaft. This fitting is a factory press fit, not screwed in.

IMPORTANT: Note position and quantity of spacer washers on pinion shaft.

5. Remove pinion shaft from left hand side (grease fitting side) of machine. Clean and inspect shaft bearing surfaces for scratches or excessive wear. Replace if required.
6. Remove pinion gear from chain. Clean and inspect teeth and bearing surfaces for wear. Bearings can be replaced using a suitable bearing driver.

Installation:



1. Install pinion gear and shaft using the same combination of washers (A) as removed.

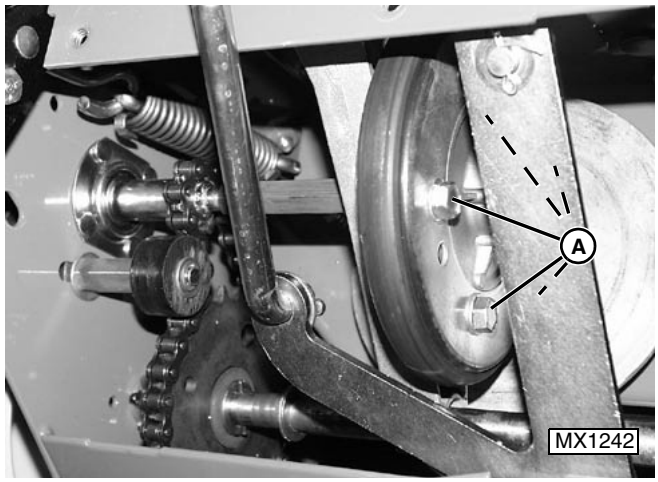
NOTE: If new pinion gear and/or shaft are installed, use washers on either side of pinion gear to center pinion gear with differential gear.

2. Install spring pins.
3. Install access panel.
4. Install the wheels.
5. Tip machine onto wheels.

FRICTION DISK

Replacement:

1. Park snowblower on a hard, smooth surface, remove wire from spark plug, tip machine onto auger housing, and remove access panel. (See "FRICTION DRIVE CLUTCH ADJUSTMENT" on page 11 for procedure.)



2. Remove five cap screws (A) attaching friction disk to hub brackets and remove disk.

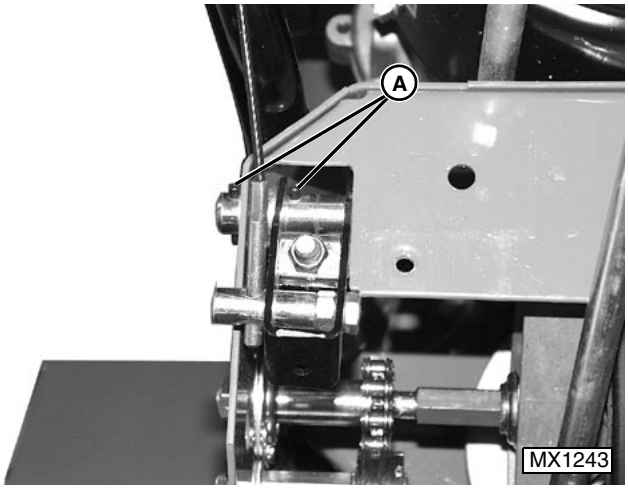
IMPORTANT: Friction disk must not come in contact with grease or oil. Damage to rubber portion of friction wheel will result.

3. Place new disk on hub and secure with five cap screws. Tighten to **12 N•m (106 lb-in.).**
4. Adjust friction drive clutch. (See "FRICTION DRIVE CLUTCH ADJUSTMENT" on page11.)
5. Replace cover, tip unit back on wheels, replace spark plug wire.

Shaft / Carrier Removal:

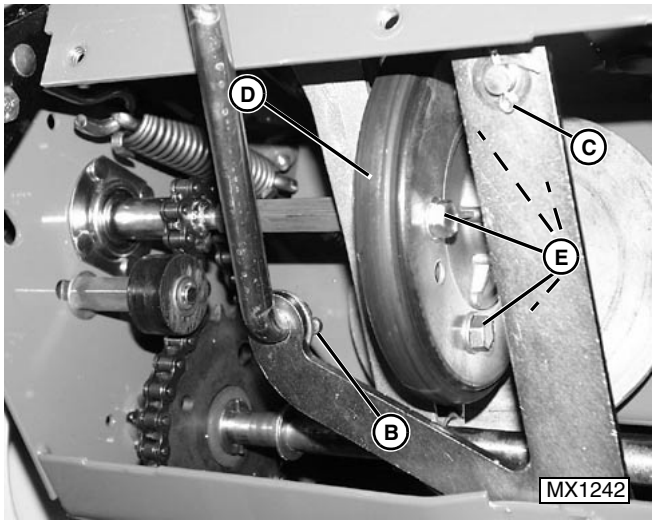
1. Park snowblower on a hard, smooth surface, remove wire from spark plug, and tip machine onto auger housing. (See "FRICTION DRIVE CLUTCH ADJUSTMENT" on page11 for procedure.)

2. Remove tension idler shaft. (See "DRIVE CHAIN ADJUSTMENT" on page12.)



NOTE: Position of washers on carrier shaft before removal of shaft.

3. Remove spring pins (A) from end of carrier shaft. Slide shaft out of housing.

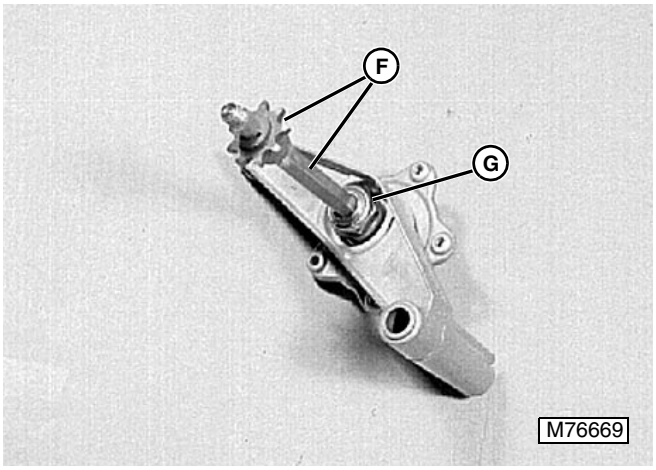


4. Remove cotter pin (B) and washer from shift lever shaft and cotter pin (C) and washer from transfer mechanism.

NOTE: Recall position of cotter pin (B) on shift lever shaft. To prevent damage to friction wheel rubber when installing washer and quick pull pin, the open end points away from friction wheel rubber. This will prevent open end from gouging the rubber.

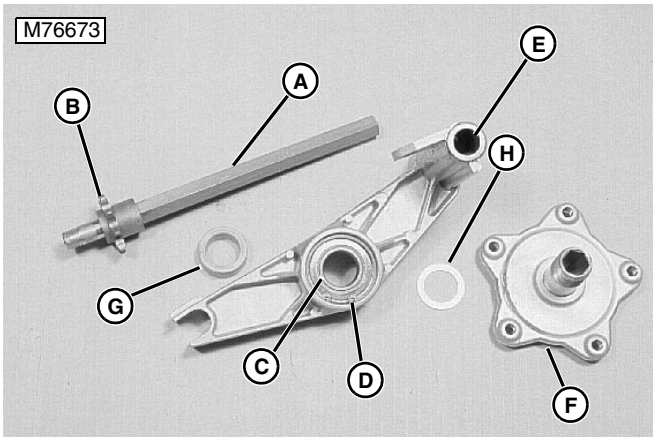
5. Remove carrier and friction disk (D).

6. Remove friction disk by removing five cap screws (E) securing it to hub.



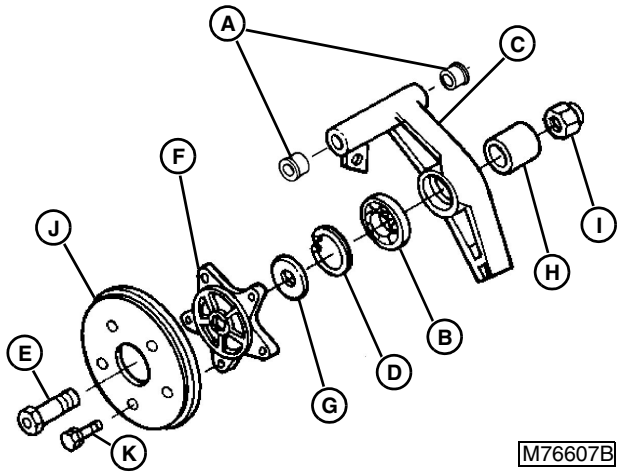
7. Remove hex shaft and sprocket (F) from carrier.
8. Remove hub from carrier by removing large nylock nut (G) on end of carrier.
9. Inspect disk for torn or missing rubber.

SHAFT / CARRIER INSPECTION:



1. Remove and inspect shaft (A) for worn bearing surfaces or damaged sprocket (B).
2. Inspect carrier bearing (C). If required replace carrier bearing by removing snap ring (D), and pressing the bearing from the carrier.
3. Replace worn or damaged parts.
4. Inspect carrier bushings (E), hub (F), spacer (G), and washer (H). Replace if worn or damaged.

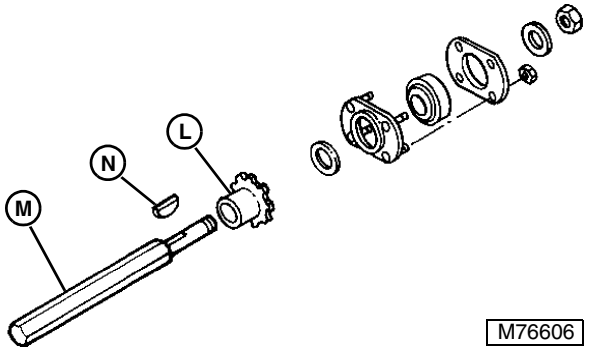
Shaft / Carrier Assembly & Installation:



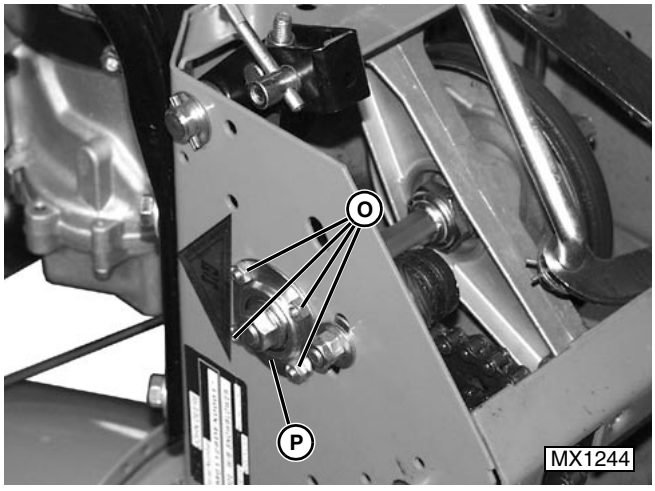
1. Install bushings (A) in carrier using a hydraulic press and suitable bearing driver.
2. Install bearing (B) in housing (C) and retain with snap ring (D).
3. Press hollow bolt (E) into hub (F).
4. Slide washer (G) and hub on hollow bolt and insert into bearing. Place spacer (H) on shaft of hollow bolt and secure with nut (I). Tighten to **150 N•m (110 lb-ft)**.

IMPORTANT: Friction disk (J) must not come in contact with grease or oil. Damage to rubber portion of friction disk will result.

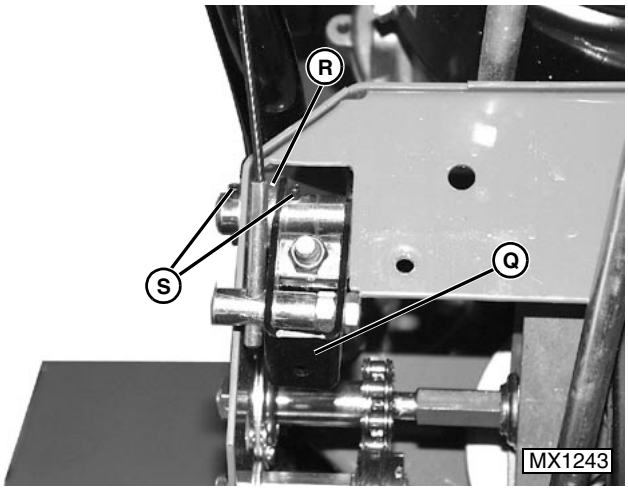
5. Place friction disk on hub and secure with five cap screws (K). Tighten to **12 N•m (106 lb-in.).**



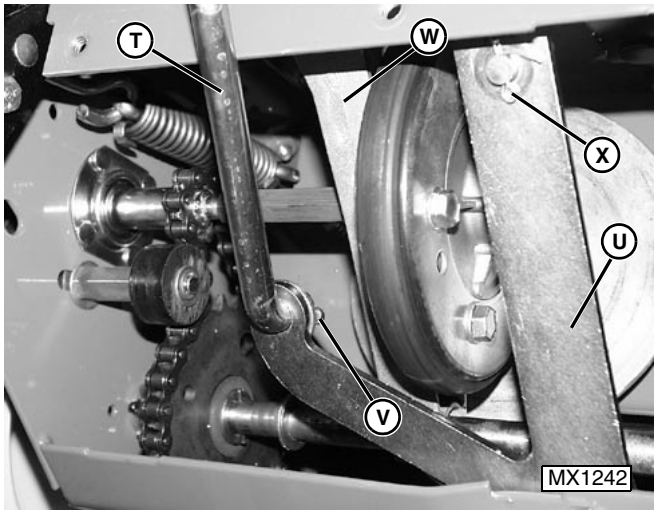
6. If removed, press sprocket (L) on hex shaft (M) with key (N) in place.



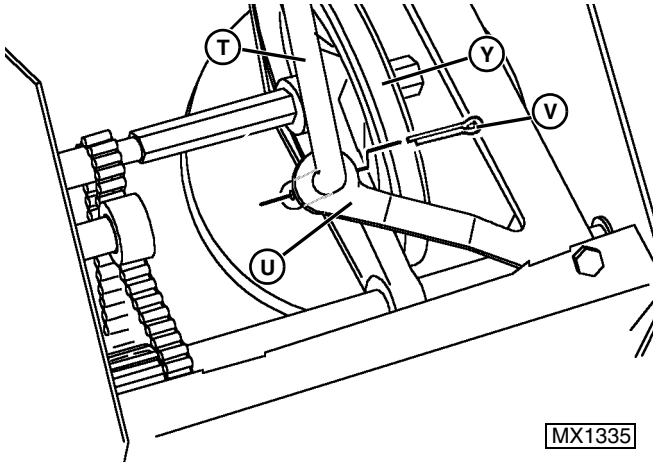
7. Bearing can be replaced by removing nuts (O) and bearing flange (P) from outside of housing.
8. Liberally coat hex shaft with **John Deere Never-Seez®—PT506 or PT569** and install in friction disk assembly.
9. Install complete assembly in housing through bearing.



10. Align carrier shaft with bearings in housing and bushings in wheel assembly. Slide through clutch pivot assembly (Q) and spacer (R). Secure in position with two spring pins (S).
11. Install idler shaft. (See “DRIVE CHAIN ADJUSTMENT” on page12.)



12. Insert shift rod (T) in pivot bracket (U) and secure with washer and new cotter pin (V). Connect carrier (W) to bracket on carrier and secure with pin and new cotter pin (X).



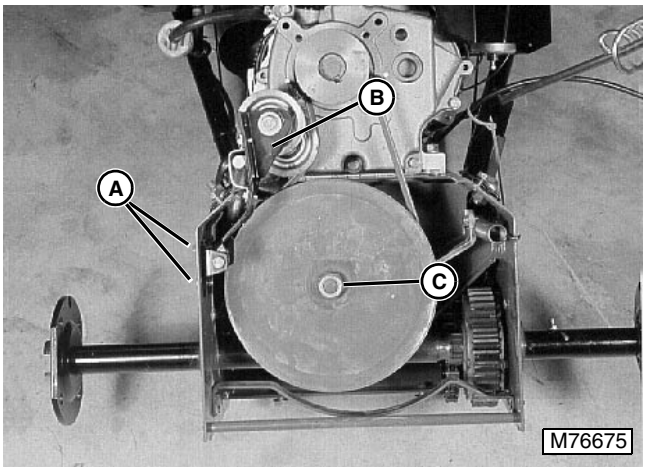
IMPORTANT: To prevent damage to friction wheel rubber (Y), install washer and cotter pin (V) so open end points away from friction wheel rubber. This will prevent open end from gouging the rubber.

13. Adjust friction disk. (See “FRICTION DRIVE CLUTCH ADJUSTMENT” on page11.)
14. Replace cover, tip unit back on wheels, replace spark plug wire.

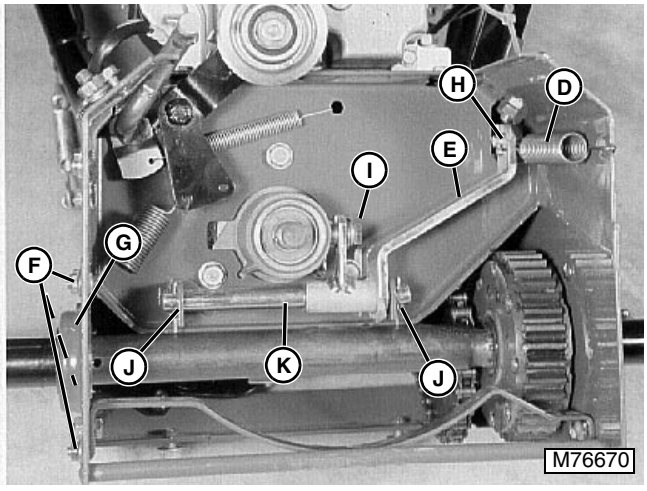
CLUTCH FORK

Removal and Installation:

1. Remove auger housing and auger. (See " DRIVE/ AUGER HOUSING" on page 21 of MISCELLANEOUS SECTION.)



2. Remove cap screws (A) securing auger clutch assembly (B) to frame. Remove auger clutch assembly.
3. Pull drive belt tensioner out of the way and remove drive belt.
4. Remove nut (C) securing large drive sheave to shaft. Remove sheave.

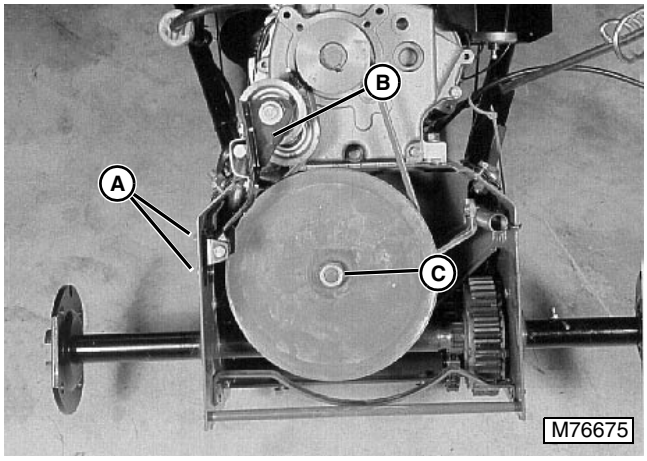


5. Unhook clutch spring (D) from housing and clutch yoke (E).
6. Remove nuts (F) securing axle bearing retainer (G) and slide retainer down axle.
7. Remove cotter pin (H) securing clutch rod to arm on clutch yoke.
8. Remove cap screw (I) securing roller to bearing housing.
9. Remove cotter pins (J) on clutch yoke shaft (K). Slide shaft out of frame and clutch yoke.
10. Inspect clutch yoke for damage or wear. Replace parts as required.
11. Installation is reverse of removal.

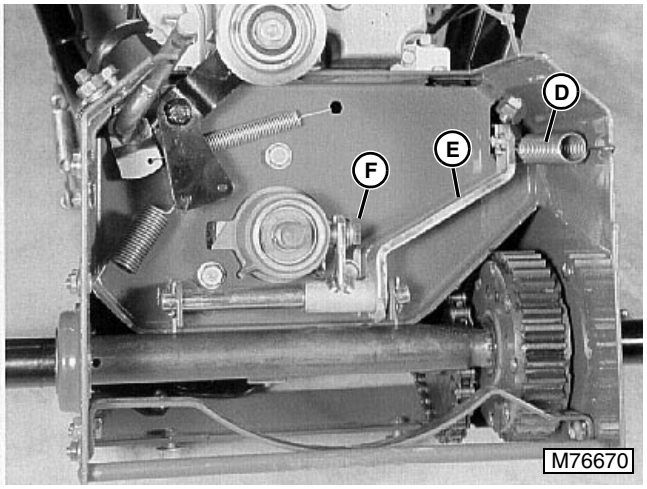
FRICTION PLATE

Removal:

1. Remove auger housing and auger. (See "DRIVE/ AUGER HOUSING" on page 21 of MISCELLANEOUS SECTION.)

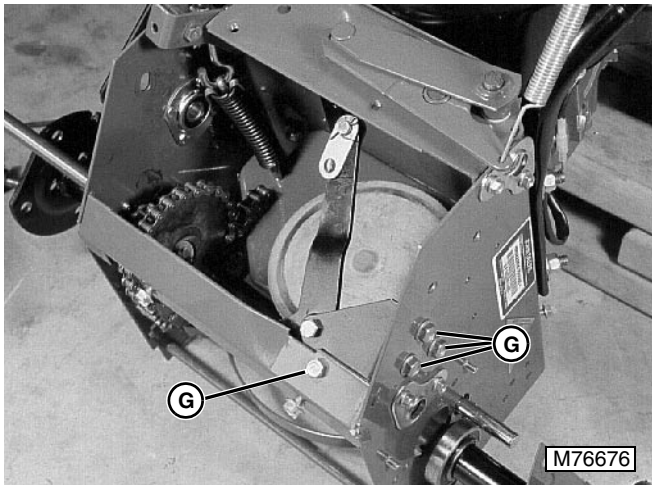


2. Remove cap screws (A) securing auger clutch assembly (B) to frame. Remove auger clutch assembly.
3. Pull drive belt tensioner out of the way and remove drive belt.
4. Remove nut (C) securing large drive sheave to shaft. Remove sheave.

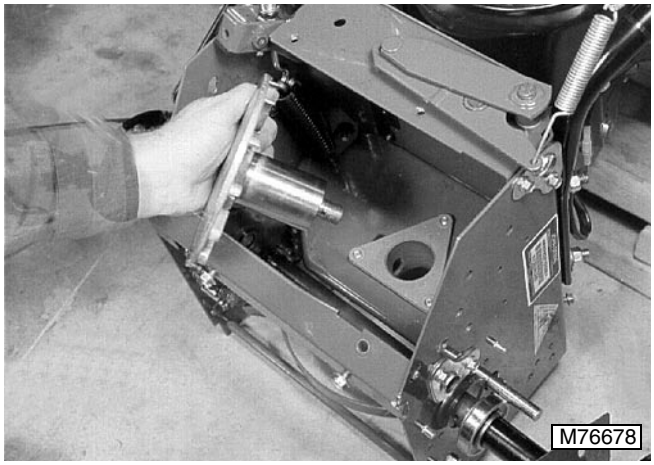


5. Unhook clutch spring (D) from housing and clutch yoke (E).

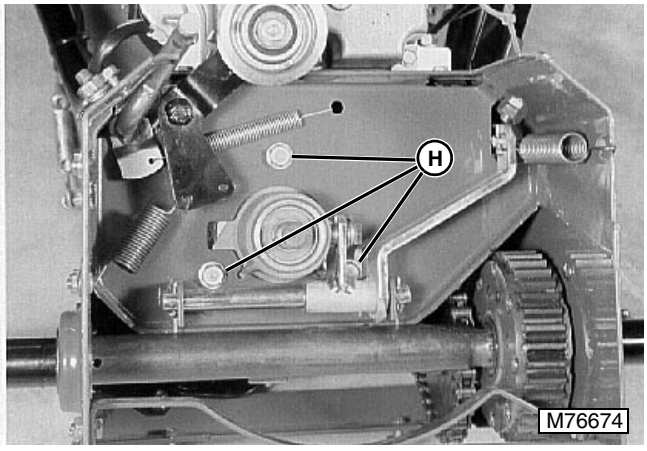
6. Remove cap screw (F) securing roller to bearing housing.
7. Turn drive unit over and remove friction disk assembly. (See “FRICTION DISK” on page19.)
8. Remove pinion shaft assembly. (See “PINION SHAFT” on page18.)



9. Remove cap screws (G) securing bracket to frame.

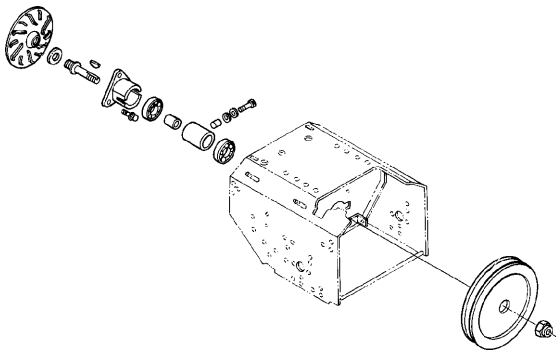


10. Remove friction plate assembly.



11. If removal of bearing carrier is required remove three cap screws (H) from drive side of frame. Remove bearing carrier from friction plate side of frame.
12. Inspect friction plate, bearing, bearing housing, and shaft for signs of scoring, or wear. Replace components as required.

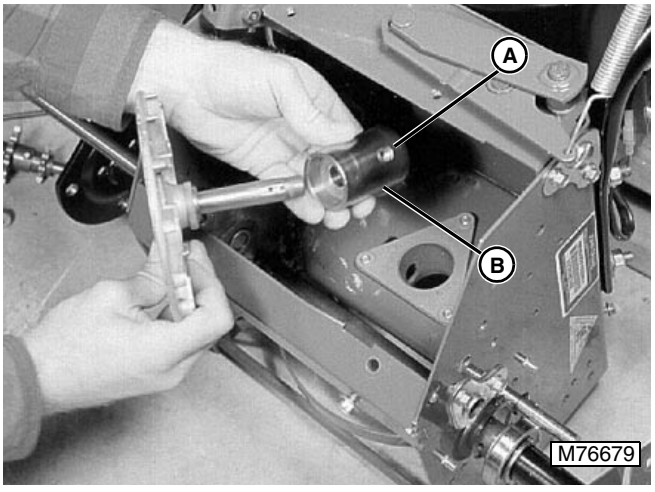
Installation:



IMPORTANT: Bearing carrier outside surface is precision machined. Take care not to scratch or raise burs on bearing carrier. DO NOT clamp in vise or use hammer or abrasives on outside surface.

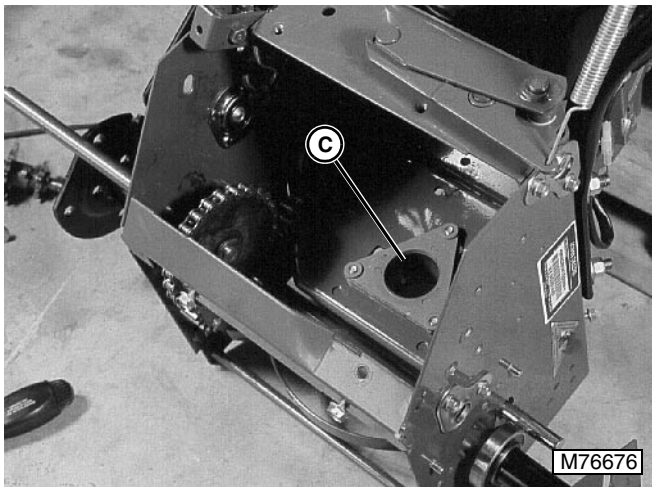
1. Install bearings and spacer in bearing carrier.

NOTE: Bearings should be installed with identification lettering facing out. Seat bearing on shoulder of bearing housing. DO NOT press bearings into housing by center hub of bearing. Install bearing using proper bearing driver.

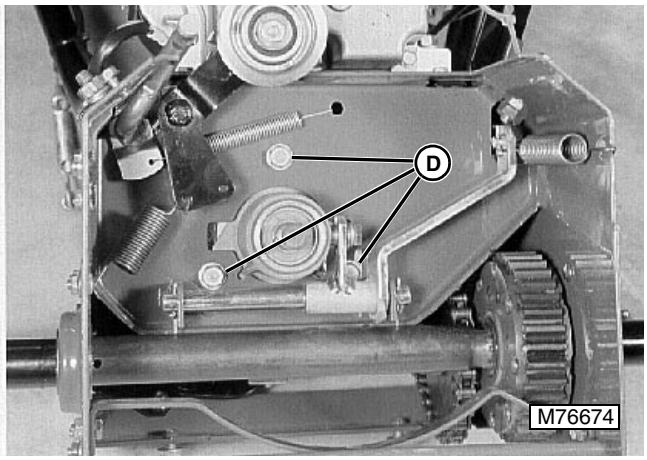


IMPORTANT: Bearing carrier must be installed on shaft with deepest set bearing closest to friction plate. Note location of threaded hole (A) in bearing carrier (B). Improper assembly will damage drive components.

2. Install shaft of friction plate in bearing carrier.
3. Install key in shaft.
4. Liberally coat outside of bearing carrier with **John Deere Never-Seez®—PT506 or PT569**.

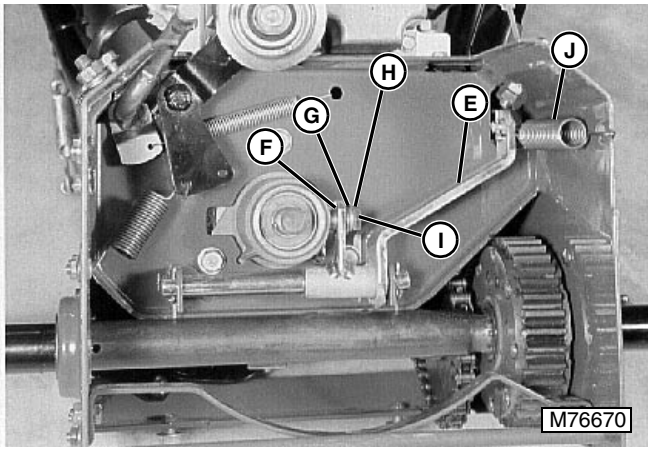


5. Clean and dry hub. Coat inside of hub (C) liberally with **John Deere Never-Seez®—PT506 or PT569**.

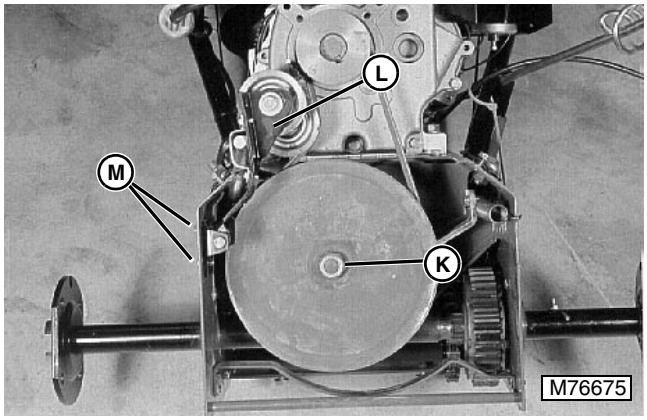


6. Install hub in frame, from back of machine, and secure with three cap screws (D). Tighten to **12 N•m (106 lb-in.).**

IMPORTANT: Friction plate must be free of any oil or grease. Damage to rubber portion of friction disk will result from contact with grease or oil remaining on friction plate.



7. Line up threaded hole in bearing carrier with slot in hub and slot in clutch yoke (E). Secure with roller (F), washer (G), lock washer (H), and cap screw (I). Tighten to **12 N•m (106 lb-in.).**
8. Attach spring (J) to arm and frame.

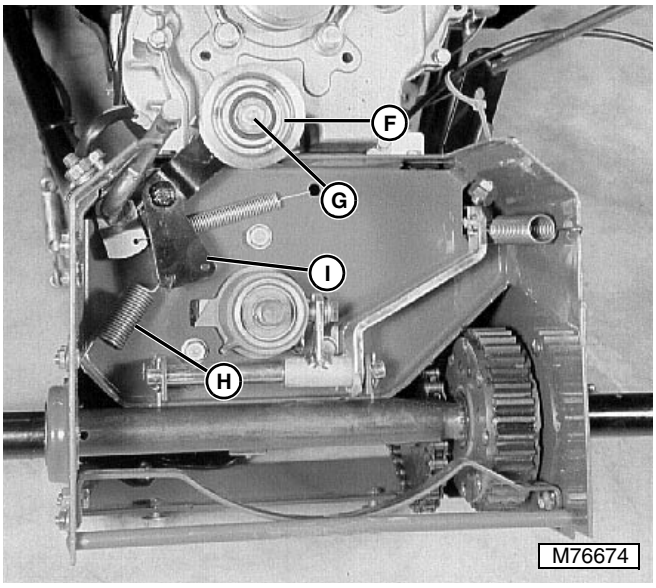


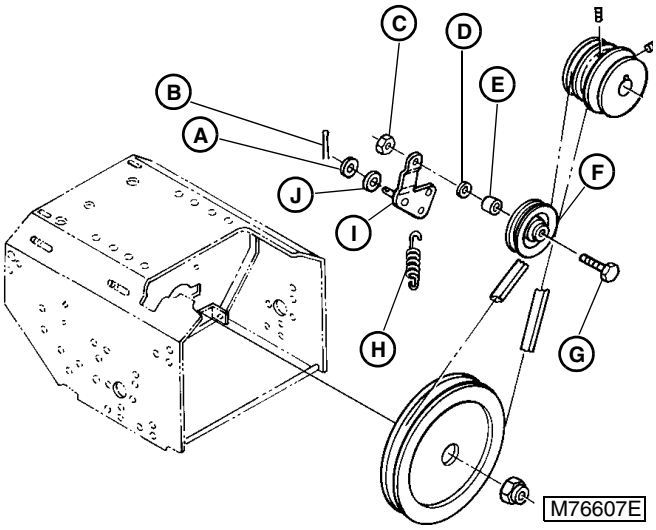
9. Align slot in drive sheave with key in shaft and install sheave. Secure with nut (K) and tighten to **12 N•m (106 lb-in.)**.
10. Install auger clutch assembly (L) and secure with four cap screws (M). Tighten to **12 N•m (106 lb-in.).**
11. Turn drive unit over and install friction disk assembly.
12. Install pinion shaft assembly. (See “PINION SHAFT” on page18.)
13. Assemble drive unit to auger section. (See “DRIVE/ AUGER HOUSING” on page 21 of MISCELLANEOUS SECTION.)
14. Check and adjust friction drive ground speed. (See “FRICTION DRIVE CLUTCH ADJUSTMENT” on page 11.)

DRIVE BELT TENSIONER INSPECTION

Procedure:

1. Inspect all parts for wear or damage. Replace if necessary.

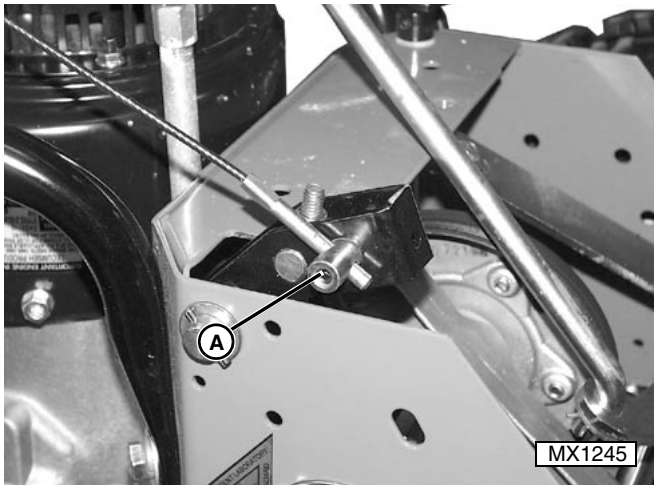




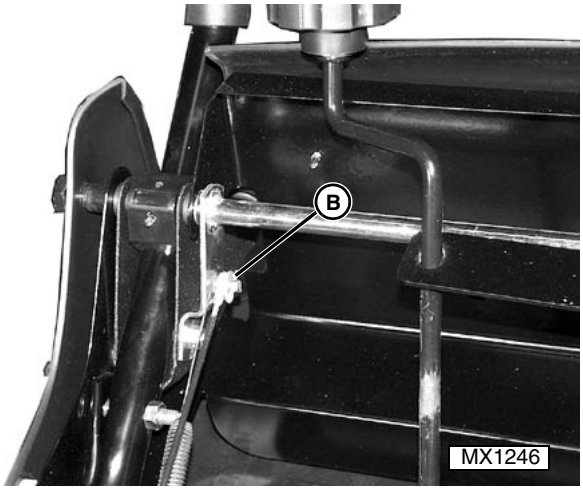
A. Spring Washer	F. Idler
B. Cotter Pin	G. Cap Screw
C. Lock Nut	H. Spring
D. Washer	I. Bracket
E. Spacer	J. Washer

CLUTCH CABLE REPLACEMENT

Procedure:



1. Loosen set screw (A) in end of pivot pin. Remove cable.



2. Remove cotter pin and washer (B) on clutch handle boss.
3. Remove cable end.
4. Place new cable on clutch handle boss, secure with washer and new cotter pin.
5. Place stud end of cable in pivot. Allow about **12 mm (0.5 in.)** travel slack in cable and tighten set screw. (See “FRICTION DRIVE CLUTCH ADJUSTMENT” on page11.)

NOTES:

CONTENTS

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SPECIFICATIONS

AUGER SPECIFICATIONS

Item	924DE	1128DE	1128DDE	1332DDE
Stages	2	2	2	2
Clearing width	610 mm (24 in.)	711 mm (28 in.)	711 mm (28 in.)	813 mm (32 in.)
Type	Serrated Steel	Serrated Steel	Serrated Steel	Serrated Steel
Housing opening (height)	406 mm (16 in.)	406 mm (16 in.)	584 mm (23 in.)	584 mm (23 in.)
Diameter	381 mm (15 in.)	381 mm (15 in.)	406 mm (16 in.)	406 mm (16 in.)
Shaft Diameter	19 mm (0.75 in.)	19 mm (0.75 in.)	25.4 mm (1.0 in.)	25.4 mm (1.0 in.)
Discharge chute rotation	220 degree	220 degree	220 degree	220 degree
Blower Diameter	305 mm (12 in.)	305 mm (12 in.)	305 mm (12 in.)	305 mm (12 in.)
Brake Pad (minimum)	1 mm (0.040 in.)	1 mm (0.040 in.)	1 mm (0.040 in.)	1 mm (0.040 in.)

OTHER MATERIALS

Number U.S./Canadian	Name	Use
TY6305	John Deere Clean and Cure Primer	Cleans parts and speeds cure of sealant
TY16135	John Deere Ultra-Blue™ RTV Silicone Form-In-Place Gasket	Seals auger gear case cover
T43512	John Deere Thread Lock and Sealer (Medium Strength)	Apply to threads of sheave set screws
TY6382 (1 gal.), TY6296 (1 qt.)	John Deere GL5 Gear Lubricant	Auger gear lubricant
TY9370 / TY9477 (#242 LOCTITE®)	Thread Lock and Sealer (Medium Strength)	Auger hub set screws

TORQUE SPECIFICATIONS

Impeller Bearing Plate Lock Nuts . . . . . 12 N•m (106 lb-in.)
Auger Bushing Plate Lock Nuts . . . . . 12 N•m (106 lb-in.)
Auger Shaft (end) Cap Screw . . . . . 70 N•m (52 lb-ft)
Auger Gearbox Cap Screws (1128DDE and 1332DDE) . . . . . 12 N•m (106 lb-in.)
Auger Gearbox Nuts and Self-tapping Screws
(924DE and 1128DE . . . . . 9.5 N•m (84 lb-in.)
Auger Shear Bolts . . . . . 10 N•m (88 lb-in.)
Auger Sheave Lock Nuts . . . . . 12 N•m (106 lb-in.)

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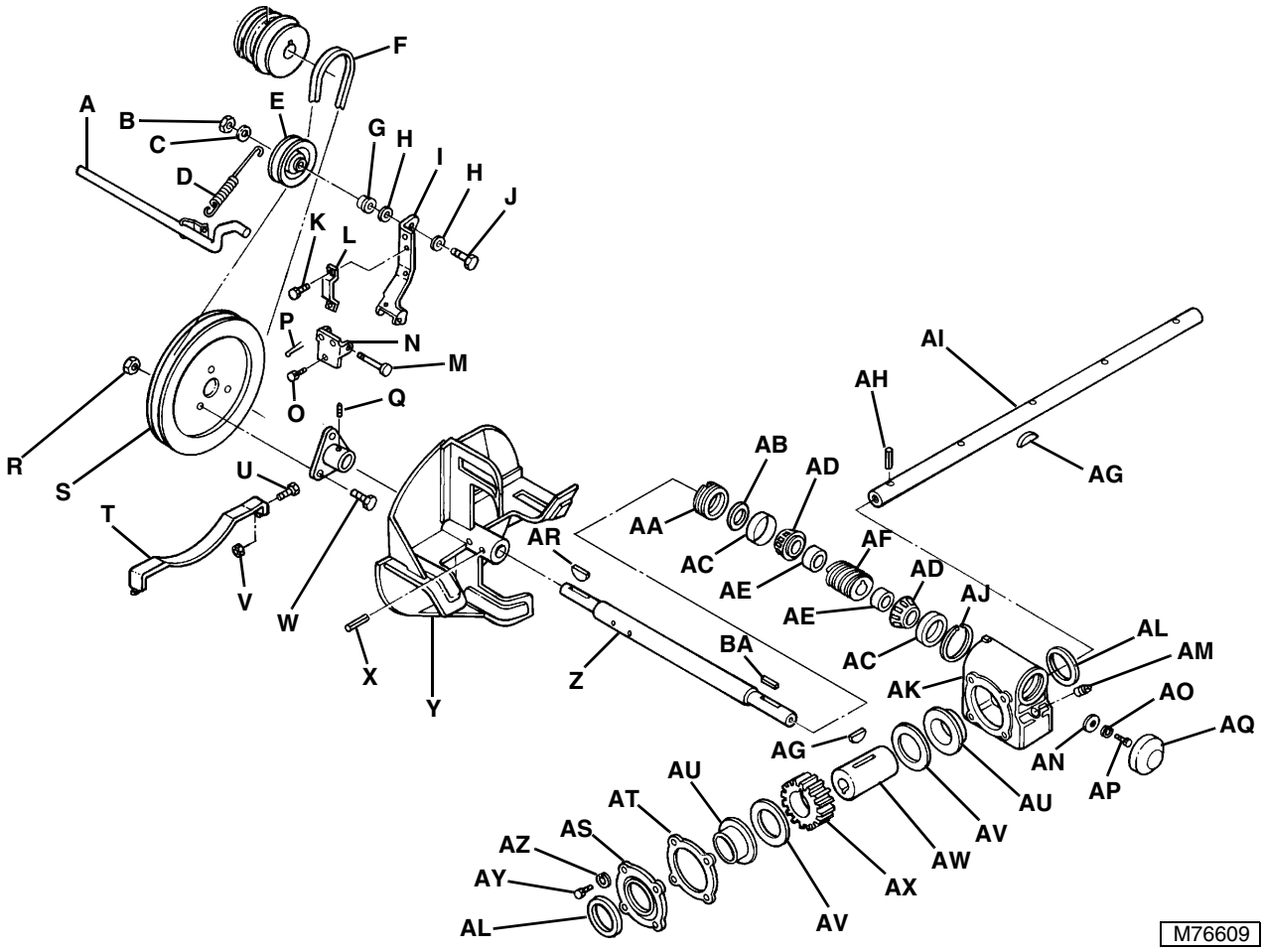
COMPONENT LOCATIONS

AUGER DRIVE—1128DDE and 1332DDE



A. Shaft
B. Nut
C. Washer
D. Spring
E. Idler
F. Belt
G. Bushing
H. Washer
I. Lever Arm
J. Cap Screw
K. Cap Screw
L. Retainer
M. Pin
N. Bracket
O. Cap Screw
P. Cotter Pin
Q. Set Screw
R. Nut
S. Sheave
T. Brace
U. Cap Screw
V. Nut
W. Cap Screw
X. Rolled Spring Pin
Y. High Speed Impeller
Z. Impeller Shaft
AA. Retaining Nut
AB. Seal
AC. Bearing Cup
AD. Bearing Race
AE. Spacer
AF. Worm Gear
AG. Key
AH. Rolled Spring Pin
AI. Auger Shaft
AJ. Snap Ring
AK. Gear Case
AL. Seal
AM. Grease Fitting
AN. Washer
AO. Lock Washer
AP. Cap Screw
AQ. Dust Cover
AR. Key
AS. Cover, Case
AT. Gasket
AU. Flange Bushing
AV. Washer
AW. Shaft
AX. Gear
AY. Cap Screw
AZ. Washer
BA. Key

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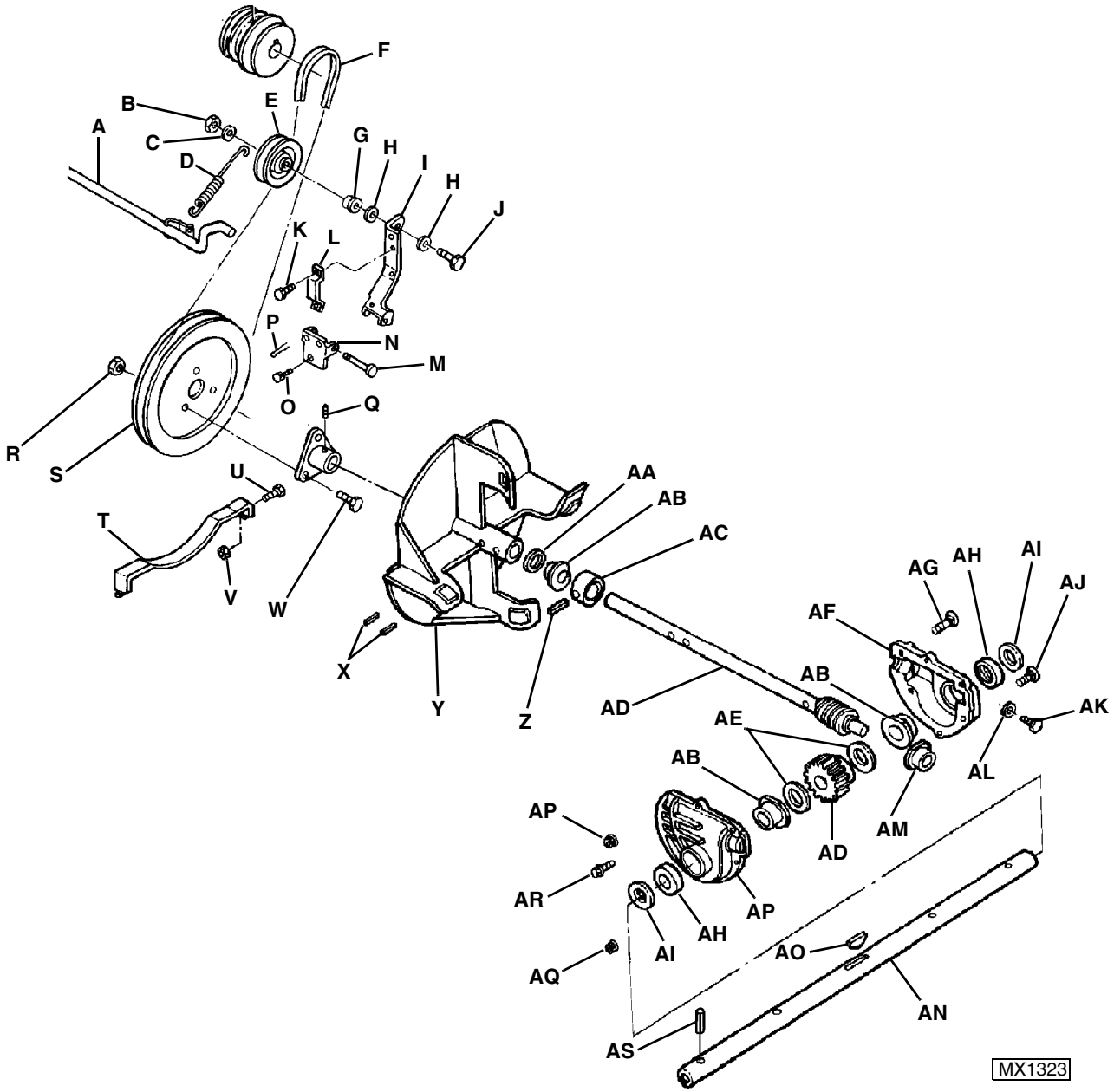
AUGER DRIVE—924DE and 1128DE



A. Shaft
B. Nut
C. Washer
D. Spring
E. Idler
F. Belt
G. Bushing
H. Washer
I. Lever Arm
J. Cap Screw
K. Cap Screw
L. Retainer
M. Pin
N. Bracket
O. Cap Screw
P. Cotter Pin
Q. Set Screw
R. Nut
S. Sheave
T. Brace
U. Cap Screw
V. Nut
W. Cap Screw
X. Rolled Spring Pin
Y. High Speed Impeller
Z. Groove Pin
AA. Seal
AB. Bushing
AC. Thrust Collar
AD. Shaft & Worm Gear Assy.
AE. Washer
AF. Left Hand Gear Case
AG. Carriage Bolt
AH. Seal
AI. Washer
AJ. Carriage Bolt
AK. Screw
AL. Fiber Washer
AM. Bushing
AN. Auger Shaft
AO. Woodruff Key
AP. Right Hand Gear Case
AQ. Lock Nut
AR. Screw
AS. Rolled Spring Pin

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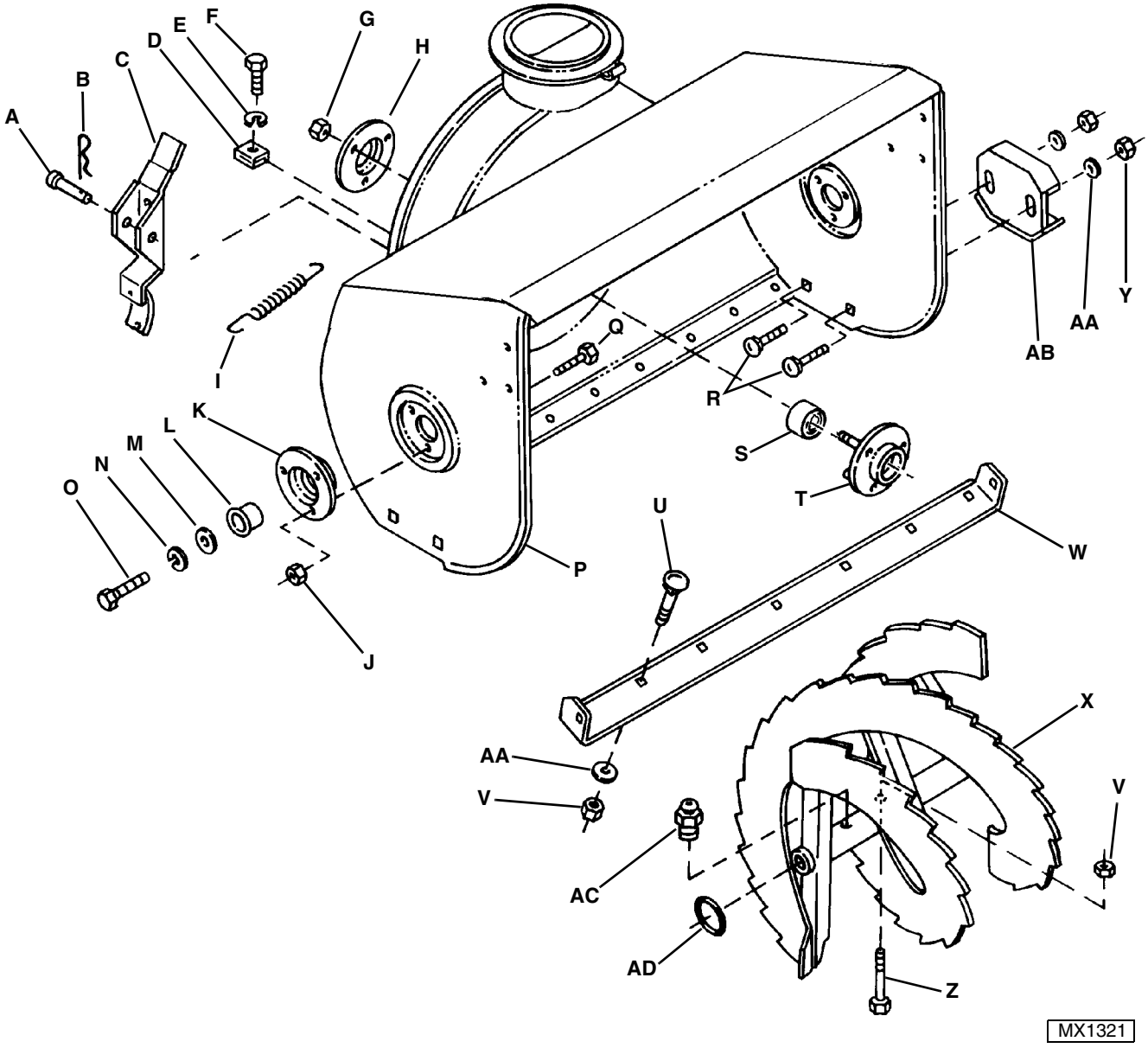
AUGER HOUSING—1128DDE and 1332DDE



A. Pin
B. Hairpin Clip
C. Brake Lever
D. Retainer
E. Lock Washer
F. Cap Screw
G. Lock Nut
H. Back Plate, Bearing
I. Spring
J. Lock Nut
K. Bushing Plate
L. Flange Bushing
M. Washer
N. Lock Washer
O. Cap Screw
P. Auger Housing
Q. Cap Screw
R. Carriage Bolt
S. Bearing
T. Front Bearing Plate
U. Carriage Bolt
V. Nut
W. Scraper
X. Auger
Y. Nut
Z. Shear Bolt
AA. Washer
AB. Skid Plate
AC. Grease Fitting
AD. Washer

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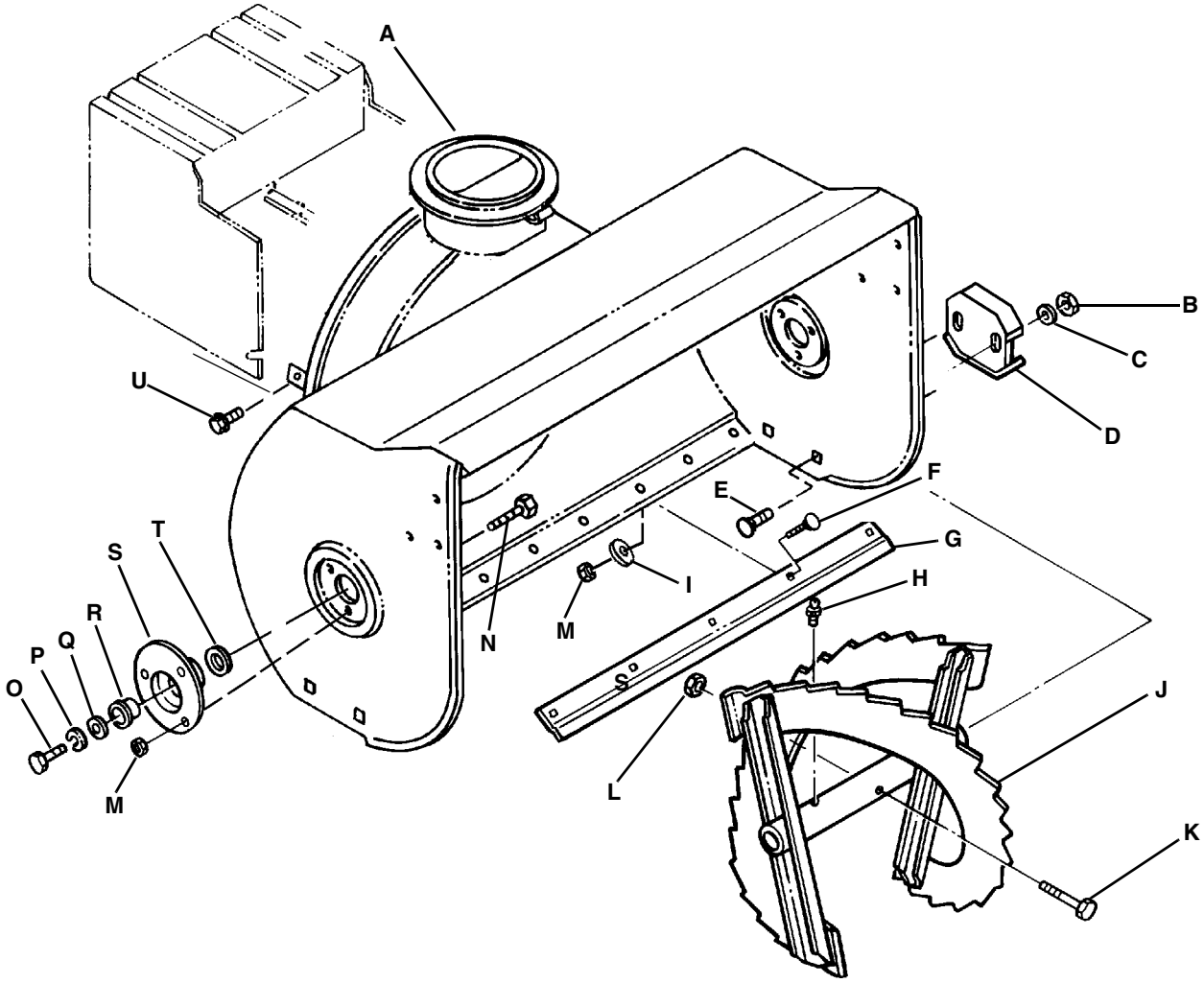
AUGER HOUSING—924DE and 1128DE



MX1322

A. Auger Housing
B. Lock Nut
C. Washer
D. Skid Plate
E. Bolt
F. Bolt
G. Scraper Blade
H. Fitting
I. Washer
J. Auger
K. Shear Bolt
L. Lock Nut
M. Lock Nut
N. Bolt
O. Cap Screw
P. Lock Washer
Q. Washer
R. Bushing
S. Bearing Flange
T. Washer
U. Screw

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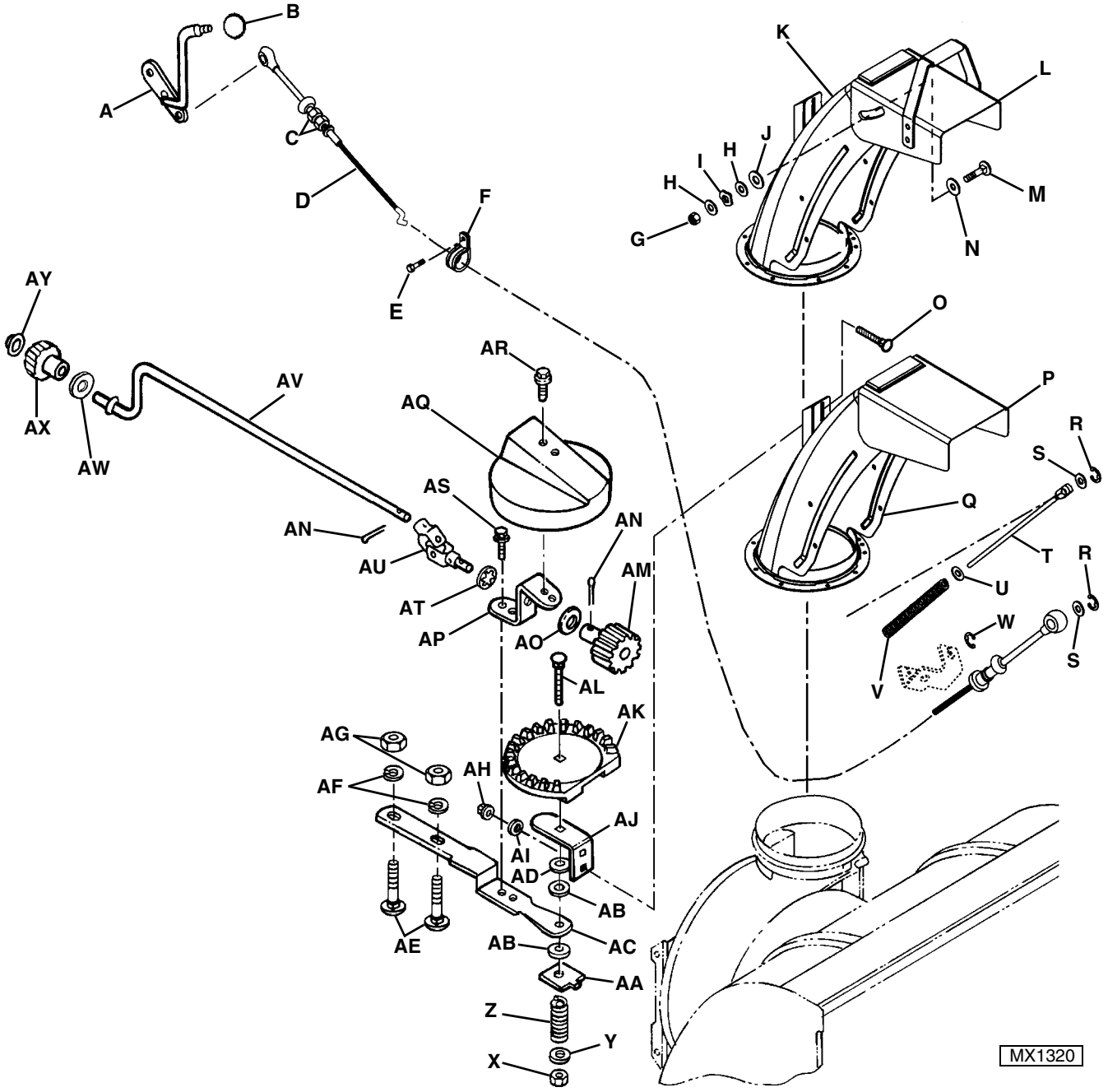
DEFLECTOR CHUTE



A. Deflector Handle
B. Knob
C. Nuts
D. Cable
E. Bolt
F. Clamp
G. Lock Nut
H. Washer
I. Washer, Wave
J. Washer, Plastic
K. Chute (924DE)
L. Deflector (924DE)
M. Bolt
N. Washer
O. Bolt
P. Deflector (1128DE, 1128DDE, 1332DDE)
Q. Chute (1128DE, 1128DDE, 1332DDE)
R. Retaining Ring
S. Washer
T. Rod, Chute
U. Washer
V. Spring
W. Retaining Ring
X. Nut
Y. Washer
Z. Spring
AA. Friction Plate
AB. Washer, Friction
AC. Strap, Chute Control
AD. Washer
AE. Carriage Bolt
AF. Lock Washer
AG. Nut
AH. Lock Nut
AI. Washer
AJ. Bracket
AK. Chute Gear
AL. Cap Screw
AM. Chute Pinion
AN. Cotter Pin or Quick Pull Pin
AO. Washer
AP. Bracket, Geat
AQ. Gear Cover
AR. Cap Screw
AS. Cap Screw
AT. Push Nut
AU. Universal Joint
AV. Crank
AW. Washer
AX. Knob
AY. Cap, 3/8 Rod

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THEORY OF OPERATION

AUGER DRIVE

1128DDE and 1332DDE—

The auger drive transfers power from the engine crankshaft to the auger in order to break up snow and discharge it at a high speed.

The double pulley attached to the engine crankshaft powers both the friction drive system and the auger drive. The friction drive is powered by the inside belt, (nearest the engine) the auger drive is powered by the outside belt.

Power runs from the engine through the drive belt to the auger drive sheave.

A lever actuated idler applies tension to the drive belt when the lever is depressed by the operator.

The auger drive system utilizes a friction brake to minimize rotation of the auger when the control lever is released. The brake is disengaged when the auger drive lever is engaged.

A high speed impeller provides the second stage, or “discharge” function of the snowblower. The impeller is pinned directly to the high speed side of the auger input shaft, so it turns with the driven sheave.

The auger input shaft drives a ninety degree gear reducer, which in turn rotates the auger cross shaft at a reduced speed. The gearbox is a worm and gear type reducer in a cast iron housing and has an oil fill/check plug.

Left and right side auger assemblies are “pinned” to cross shaft with drive pins.

924DE and 1128DE—

The auger drive is similar to both the 1128DDE and 1332DDE models with the following difference:

The gearbox is a worm and gear type that uses aluminum case halves.

CHUTE CONTROL SYSTEM

The chute controls the direction, elevation and distance that snow is discharged. Control chute rotation and chute deflection are controlled by the operator from the control station.

Chute rotation functions through a rotary control lever, connected through a series of control rods and universal joints to a “spiral” that acts like a gear to rotate chute.

Chute deflector control positions the chute angle. Moving the handle back, towards operator, causes the chute cable to pull the chute down. Return spring moves the chute back up (1128DE, 1128DDE, and 1332DDE models only). Chute deflector for the 924DE includes a manual adjusting arm on the deflector for adjusting the angle of snow discharge.

Tension adjuster is provided to allow the operator to vary the amount of force needed to control the chute during operation.

The snowblower housing is equipped with adjustable skid plates and scraper bar.

TROUBLESHOOTING

Problem or Symptom / Check or Solution	Auger Will Not Turn	Snow Will Not Discharge
Broken Drive Belt.	●	●
Clutch out of adjustment	●	●
Broken shear pin	●	●
Clogged discharge chute		●

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TESTS AND ADJUSTMENTS

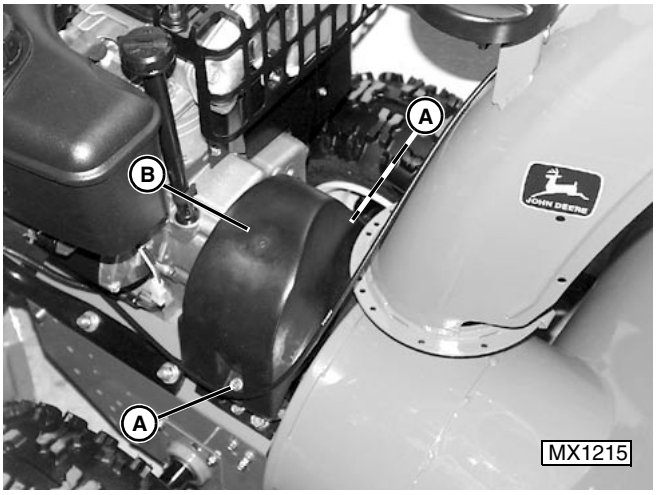
BELT ALIGNMENT PROCEDURE

Reason:

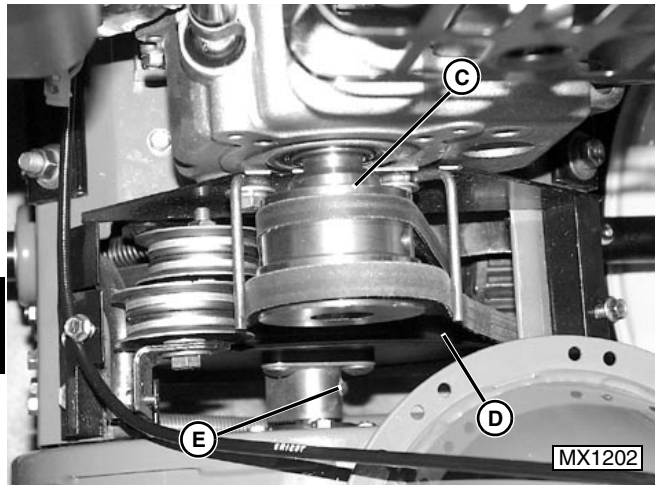
To prevent premature wear and slippage of belt during normal operating conditions.

Procedure:

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.



2. Remove two cap screws (A) to remove belt cover (B).



3. Visually inspect alignment between drive pulley (C) and driven pulley (D). Belt should not noticeably deviate from a straight line between two pulleys.
4. If belt is not straight, loosen set screws (E) on driven pulley and move in direction necessary to achieve proper alignment.
5. When belt is properly aligned tighten set screws.
6. Replace belt cover.

IMPELLER BRAKE ADJUSTMENT

Reason:

To test if auger brake pad contacts auger belt sufficiently to stop axle assembly.

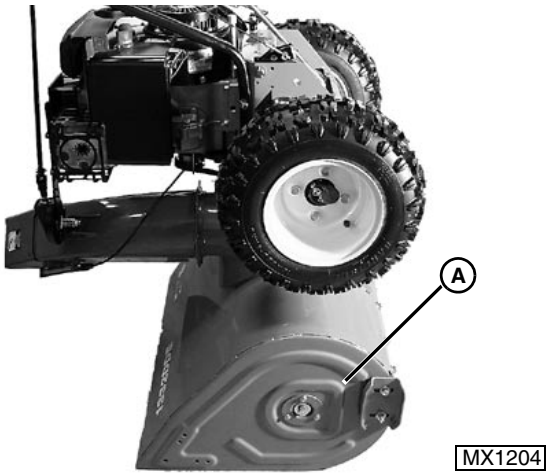
Procedure:

1332DDE—

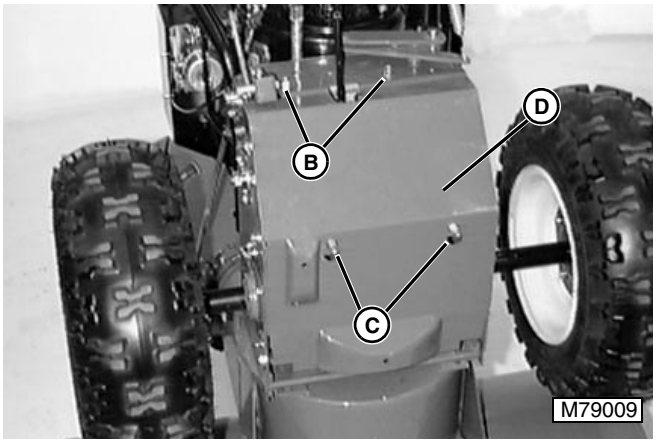
1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.

⚠ CAUTION

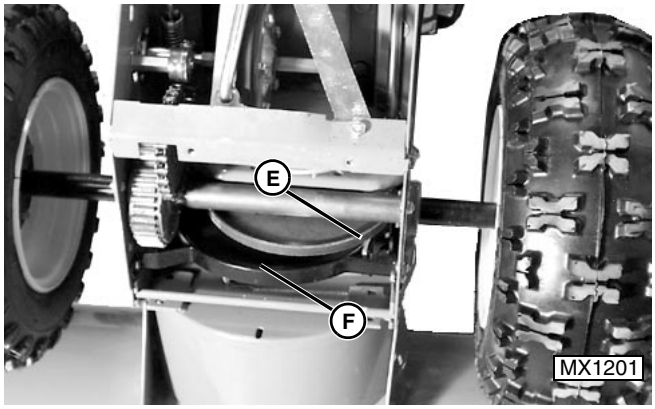
Remove enough fuel from fuel tank so that no spillage will occur when unit is tipped up onto housing. Gasoline is extremely flammable. DO NOT SMOKE. Always work in a well ventilated area away from open flame or spark producing equipment.



2. Tip machine forward onto auger housing (A).

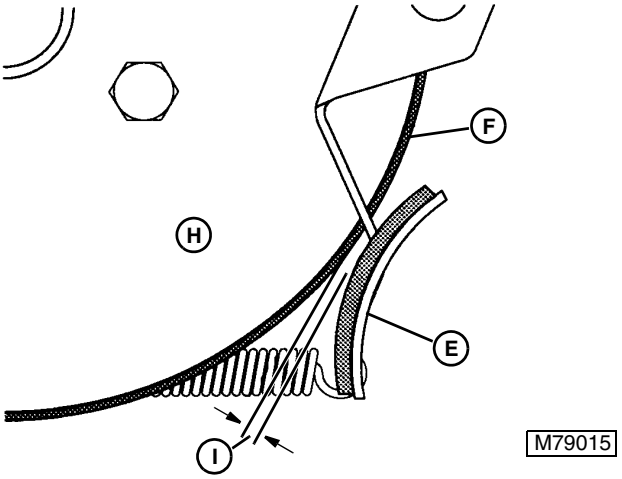


3. Remove top bolts (B) and loosen lower bolts (C) to remove access panel (D).



4. With auger drive lever released, the brake pad (E) must contact auger drive belt (F).
5. Inspect drive belt. If excessively frayed and/or worn replace belt.
6. Inspect brake pad. If worn to less than **1mm (0.040 in.)**, replace pad.

7. Engage auger drive lever (G).



8. Check clearance between brake pad (E) and auger drive belt (F) on auger drive sheave (H). Clearance should be approximately **1.5 - 3 mm (0.06 - 0.11 in.**) (I).
9. With auger drive lever released, the brake pad must contact auger drive belt.

NOTE: Pad should contact belt in the approximate center of the brake pad material.

⚠ CAUTION

Adjustment of brake mechanism should only be carried out by a authorized repair person.

Improper adjustment of the auger brake can cause severe personal injury and death.

Results:

- If clearance is incorrect, bend brake arm slightly to provide proper clearance at brake.
- Repeat steps seven through ten to verify proper operation of brake.

10. Install access panel.

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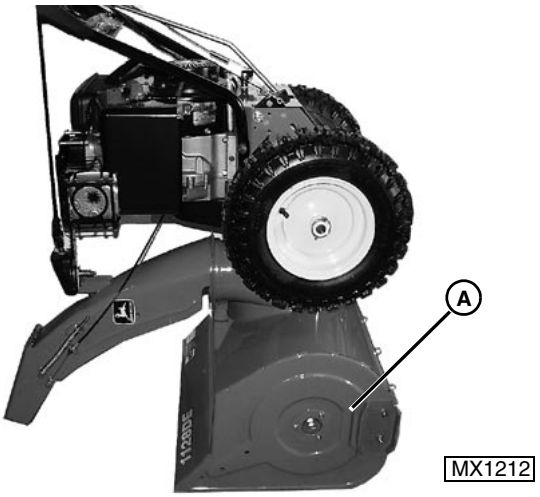
924DE, 1128DE, & 1128DDE—

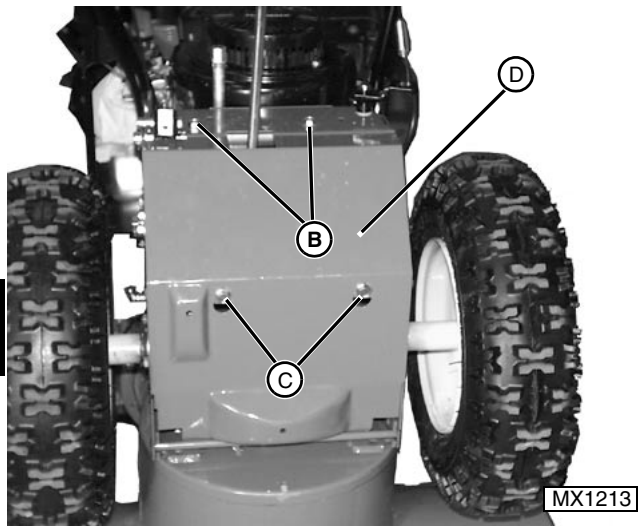
1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.

⚠ CAUTION

Remove enough fuel from fuel tank so that no spillage will occur when unit is tipped up onto housing. Gasoline is extremely flammable. DO NOT SMOKE. Always work in a well ventilated area away from open flame or spark producing equipment.

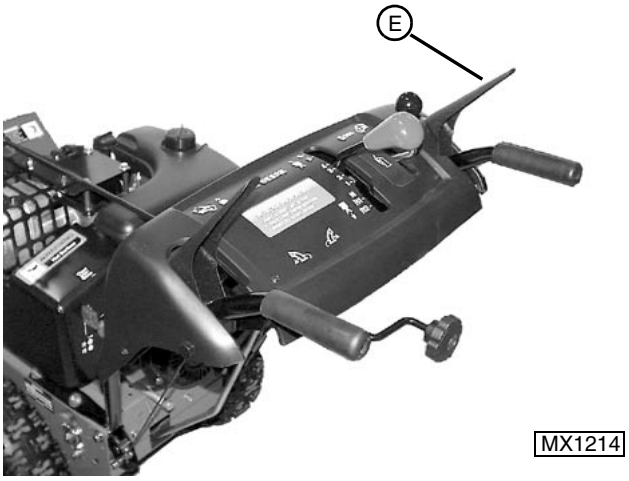


2. Tip machine forward onto auger housing (A).

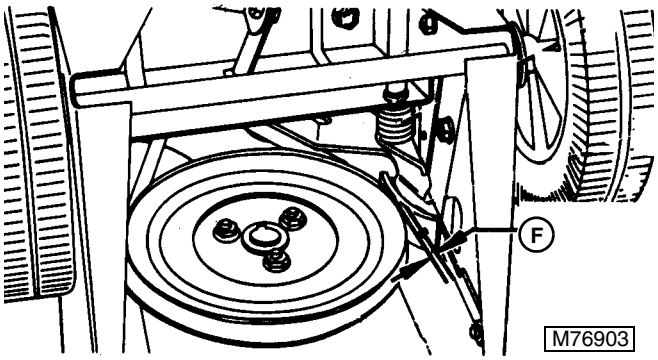


3. Remove two upper bolts (B), and loosen two lower bolts (C). Remove access panel (D).

4. With auger drive lever released, the brake pad must contact auger drive belt.
5. Inspect drive belt. If excessively frayed and/or worn replace belt.
6. Inspect brake pad. If worn to less than **1mm (0.040 in.)**, replace pad.



7. Engage auger drive lever (E).



8. Check clearance between brake pad and auger drive belt on auger drive sheave. Clearance should be approximately **1.6 - 3 mm (0.06 - 0.12 in.**) (F).

Results:

- If proper clearance is not present release the drive lever, and loosen the auger drive belt idler nut. Reposition the idler to provide the correct clearance, and tighten the nut.
- Repeat steps seven through nine to verify proper operation of brake.

9. Install access panel and return the machine to operating position.

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DEFLECTOR CHUTE LEVER ADJUSTMENT

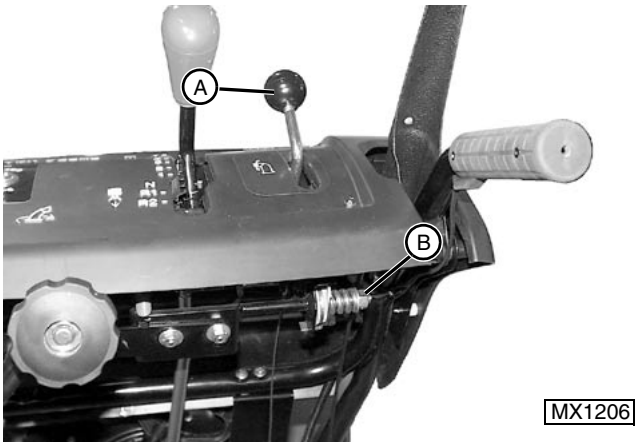
Reason:

To make chute deflector control lever move with no restrictions in motion and maintain set position.

Procedure:

1128DE, 1128DDE, and 1332DDE—

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.

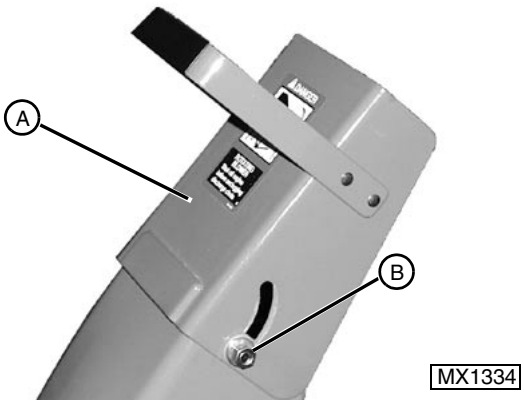


1332DDE Model Shown (other models similar)

2. Check chute deflector lever (A) and adjust if necessary:
   - If lever is too loose, tighten nut (B).
   - If lever is too tight, loosen nut.

924DE—

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.



2. Check chute deflector (A) and adjust if necessary:
   - If chute is too loose, tighten nuts (B) on the side of deflector.
   - If chute is too tight, loosen nuts.

AUGER DRIVE BELT TENSION ADJUSTMENT

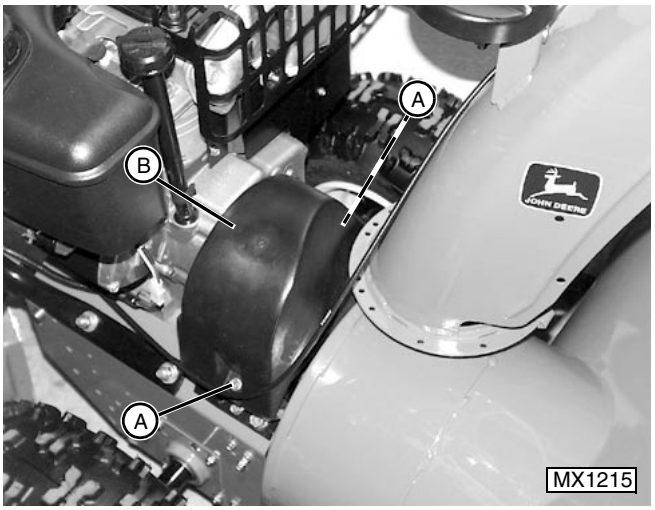
Reason:

To prevent premature wear and slippage of belt during normal operating conditions.

NOTE: Auger drive belt tension should be checked at the beginning of season or every 25 operating hours.

Procedure:

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.



2. Remove two cap screws (A) to remove belt cover (B).

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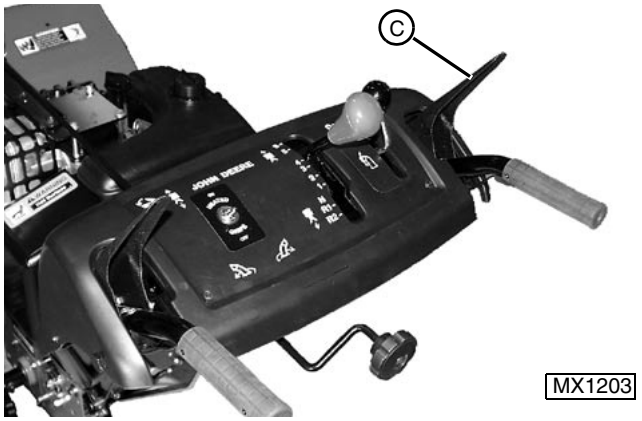
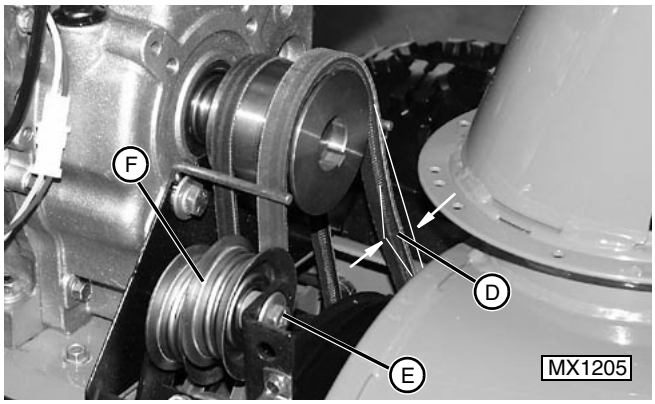


1332DDE Model shown

3. Hold auger drive lever (C) in the engaged position while checking belt tension.



4. Check drive belt deflection (D). Belt should deflect a little with moderate thumb pressure.
5. Adjust belt, If necessary, by:
   - Disengaging belt drive lever.
   - Loosen nut (E) on idler pulley (F). Move pulley toward belt.
   - Tighten nut.
   - Check belt deflection again, repeat if necessary.
6. Install belt cover and secure with two cap screws.

BELT GUIDE ADJUSTMENT

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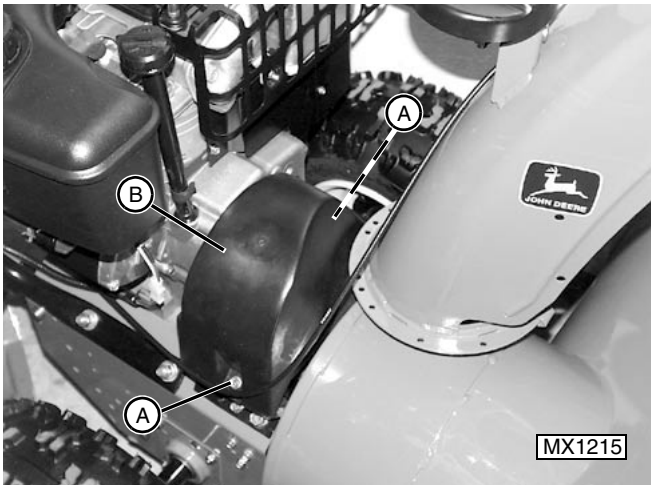
Reason:

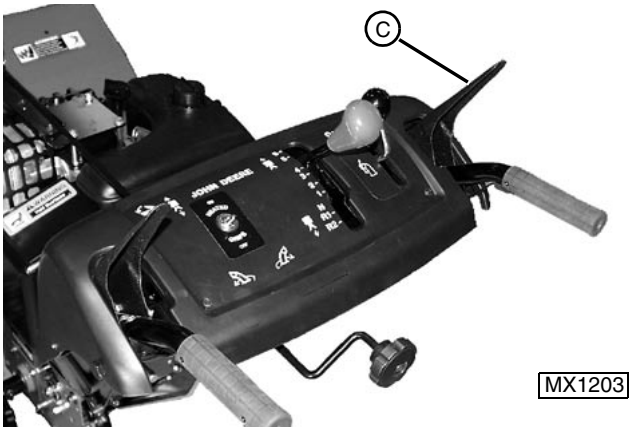
To prevent belt from jumping or slipping off of drive sheave during operation.

Procedure:

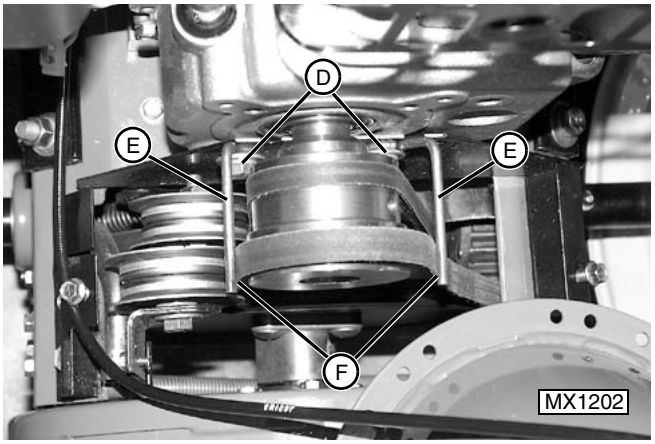
1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.



2. Remove two cap screws (A) to remove belt cover (B).



3. Hold auger drive lever (C) in the engaged position while checking belt guides.



4. Loosen cap screws (D), and adjust guides (E) to obtain clearance of **3 mm (0.125 in.)** (F) to belt.

SCRAPER BLADE ADJUSTMENT

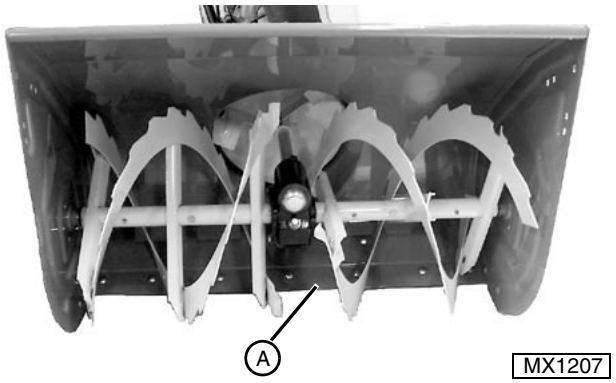
Reason:

To adjust scraper blade for affective snow removal and preventing premature blade wear.

Procedure:

IMPORTANT: If scraper blade wears too far, auger / impeller housing may be damaged.

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for all moving parts to stop, and remove wire from spark plug to prevent accidental starting.
2. Tip unit back onto handle bars and support housing.
3. Adjust skid plates to their full up position. (See next section.)



4. Inspect scraper blade (A) for damage.

Results:

- If scraper blade has excessive wear, replace it.
- To adjust a serviceable scraper blade; loosen nuts and reposition scraper blade flush with skid plates.

5. Tighten nuts.
6. Adjust skid plates to the proper height. (See next section.)

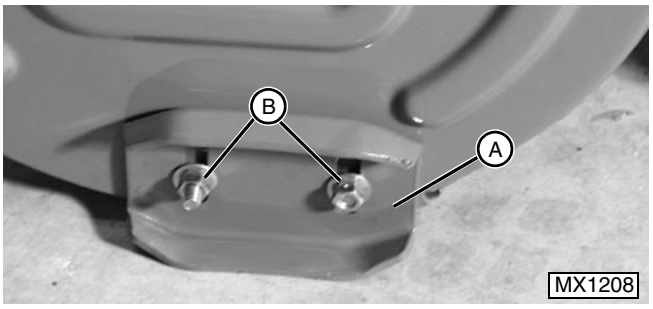
SKID PLATE ADJUSTMENT

Reason:

To adjust skid plate for effective snow removal and preventing premature scraper blade wear.

Procedure:

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for all moving parts to stop, and remove wire from spark plug to prevent accidental starting.
2. Check tires:
   - Air pressure in both tires should be equal, although some machine leveling can be made by using different pressures. Check for a maximum of **138 kPa (20 psi)** in each tire.
   - Each tire must be resting on hard surface, not a cross-link of tire chain.
3. Put a block under auger housing.



4. Inspect skid plates (A):
   - If skid plates have excessive wear, replace them.
5. If skid plates can be adjusted, loosen two flange nuts (B) and move skid plate to desired position.
6. Tighten nuts. Adjust other skid plate to the same height.

Results:

- <u>To operate on a smooth, hard surface:</u> Adjust skid plates so there is **3 mm (1/8 in.)** between scraper blade and surface.
- <u>To operate on gravel or uneven surface:</u> Adjust skid plates so there is **30 mm (1-1/4 in.)** between scraper blade and surface.

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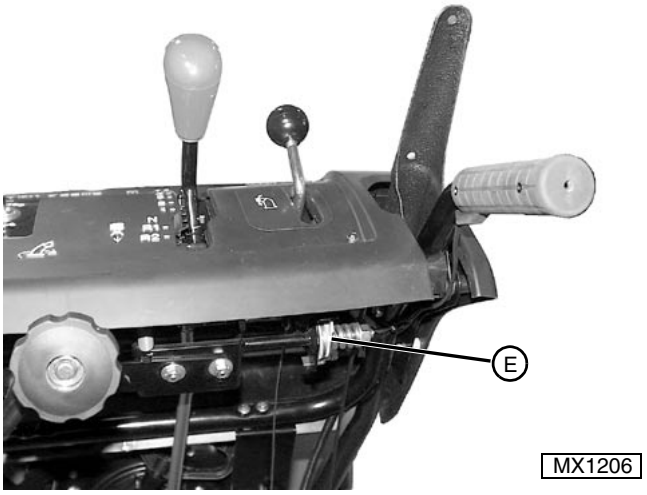
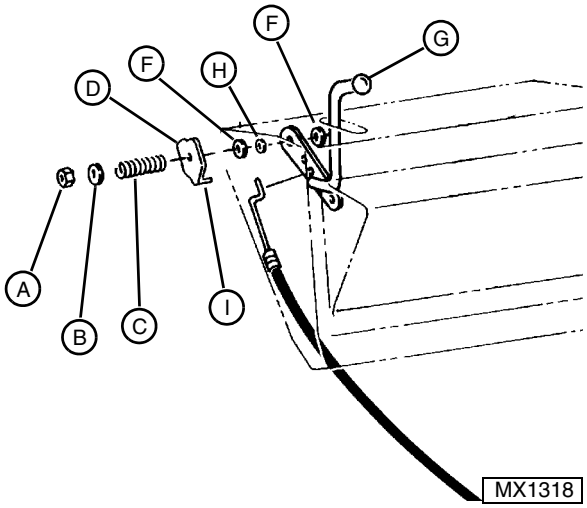
REPAIR

DEFLECTOR CHUTE CLUTCH REPLACEMENT—1128DE, 1128DDE, and 1332DDE

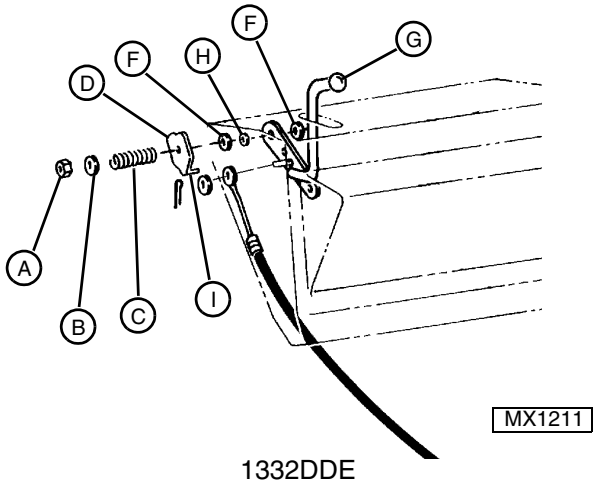
Procedure:

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.





1128DE, and 1128DDE



1332DDE

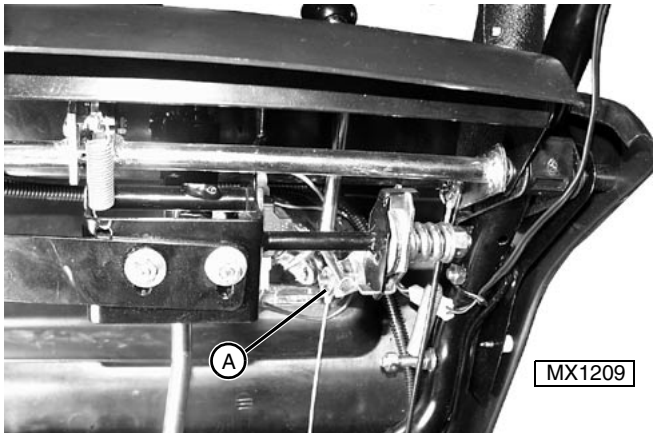
2. Remove nut (A), washer (B), spring (C), and lock plate (D) to remove clutch assembly (E).
3. Remove fiber washers (F) on either side of control arm (G).
4. Making sure spacer (H) is in place inside control arm hole, assemble new fiber washers (F), lock plate (D), spring (C), washer (B) and nut (A).

NOTE: Make sure that tab (I) in lock plate engages matching recess in control arm.

DEFLECTOR CHUTE CABLE REMOVAL—1128DE, 1128DDE, and 1332DDE

Procedure:

1. Park snowblower on a hard, smooth surface. Stop engine, remove key, wait for moving parts to stop, and remove wire from spark plug to prevent accidental starting.
2. Press and hold or tape deflector chute down to put enough slack in cable to unhook cable anchor from control arm under operator control panel.



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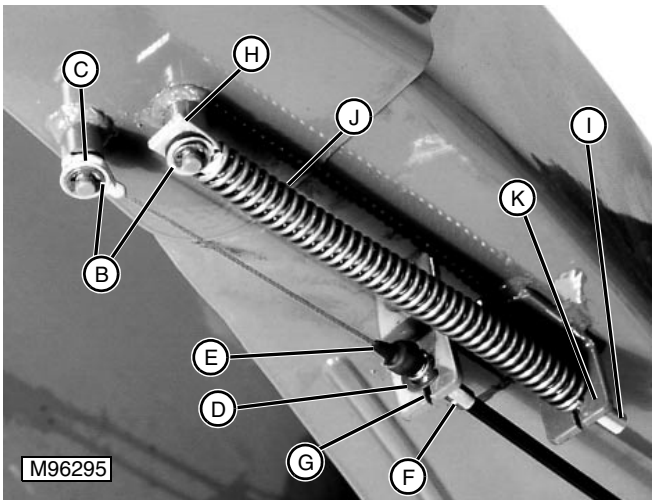
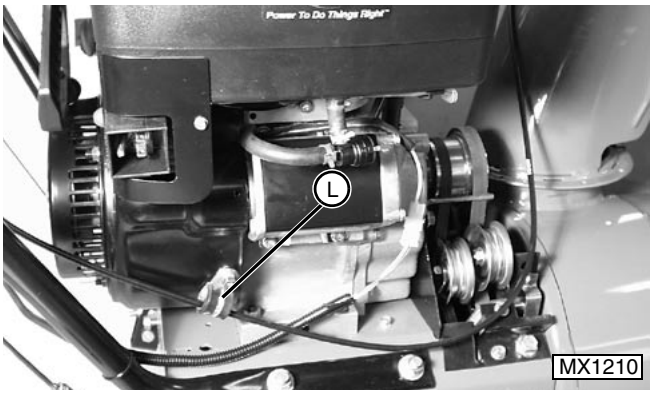
3. Remove cable from bracket:
   - Model 1332DDE remove cotter pin and washer (A) securing cable housing to bracket.
   - Models 1128DE and 1128DDE remove cable by lifting and tilting cable end out of lever.
4. Remove cable from bracket.



1128DE AND 1128DDE models shown
(1332DDE model similar)

5. Remove E-ring and washer (B) to slide cable anchor (C) from stud.
6. Remove E-ring (D), slide rubber boot (E) off cable housing (F), pull housing down from bracket, then slide cable out through mounting bracket slot (G).
7. Remove E-ring and washer (B) from deflector chute stabilizer assembly to remove rod anchor (H) from stud, then pull stabilizer rod (I) and spring (J) from mounting bracket (K).

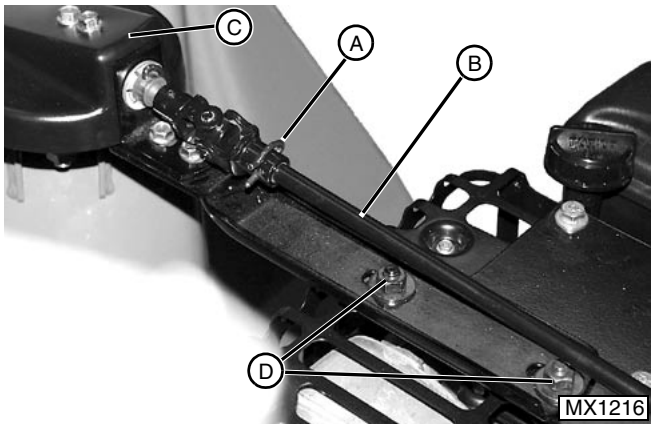


8. Pull cable from right-side engine grommet (L).
9. Installation is performed in reverse order of removal.

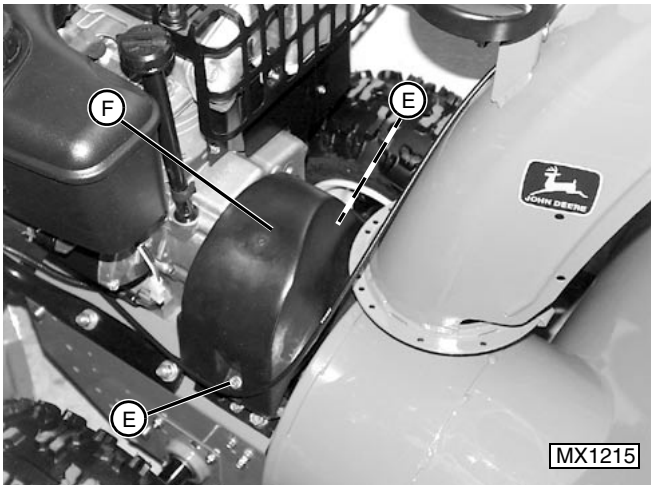
AUGER DRIVE BELT REPLACEMENT

1128DDE and 1332DDE—

1. Park snowblower on a hard, smooth surface, tip machine onto auger housing, and remove access panel. (See “IMPELLER BRAKE ADJUSTMENT” on page10 for procedure.)
2. Tip unit back to operating position.



3. Remove cotter pin (or quick pull pin) (A) from chute crank rod (B).
4. Slide chute crank rod (B) from chute gear assembly (C).
5. Remove attaching hardware (D).



6. Remove two cap screws (E) to remove belt cover (F).

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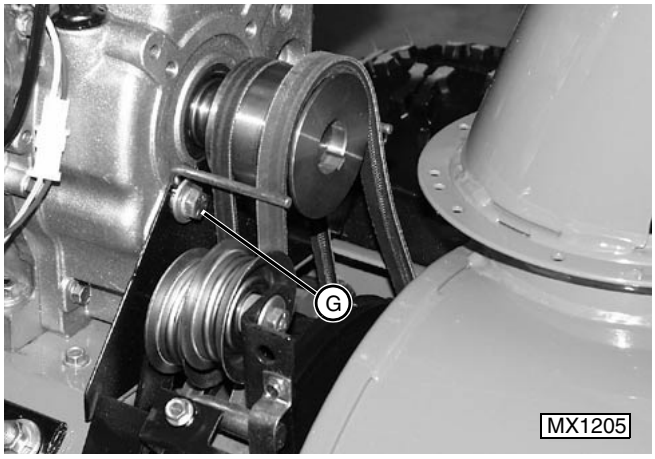
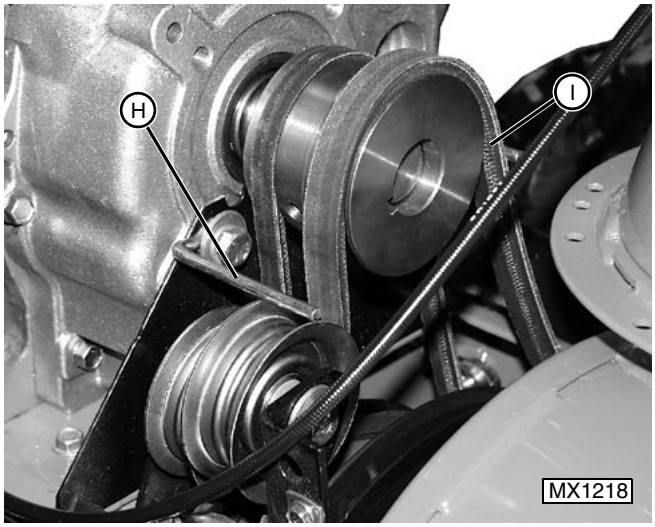


7. Remove cap screw with lock washer and flat washers (G) to loosen belt guide.



8. Move belt guide (H) enough to remove auger drive belt (I) from engine drive sheave.

IMPORTANT: When leaning back engine frame, DO NOT stretch discharge chute cable.

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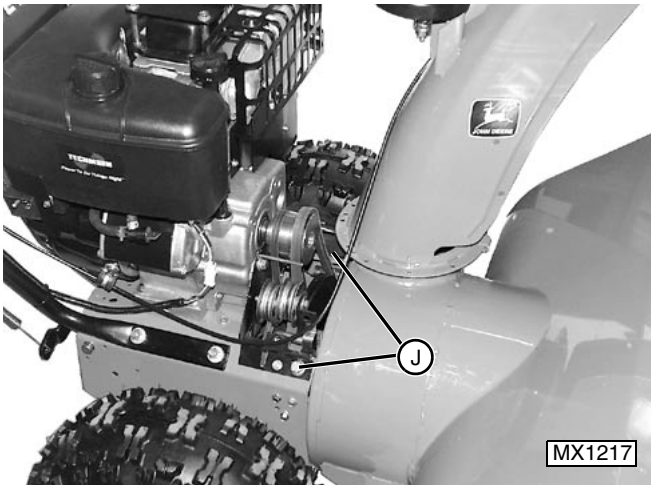
⚠ CAUTION

Make sure drive unit is supported before removing any fasteners. Drive unit will be unbalanced and fall backwards if not supported.

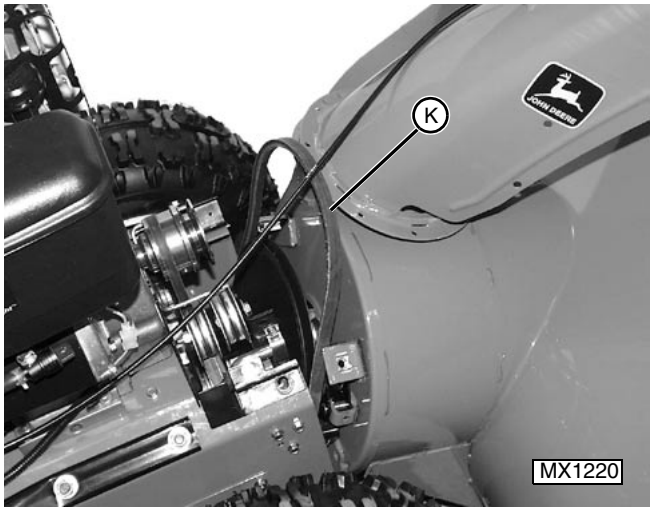
9. Put a support in place to rest handlebars on when drive is split.



10. Remove two cap screws (J) while holding engine frame stationary.

IMPORTANT: Lean engine frame back only far enough to expose the auger drive belt. DO NOT over-stretch deflector chute cable.

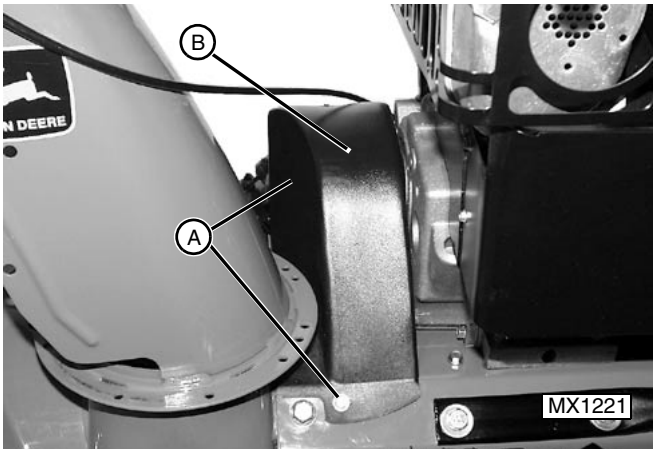
11. Slowly lean engine frame back and rest handle bars on support stand.



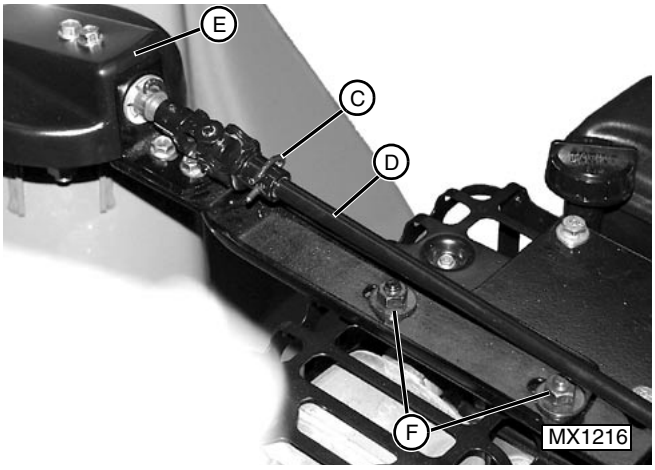
12. Remove auger drive belt (K) and install new belt.
13. Pivot unit back together and tighten all cap screws.
14. Install auger drive belt onto engine drive sheave.
15. Check alignment of drive and driven sheaves. (See “BELT ALIGNMENT PROCEDURE” on page10.)
16. Check auger drive belt tension and adjust if necessary. (See “AUGER DRIVE BELT REPLACEMENT” on page17.)
17. Install belt guide and hardware. (See “BELT GUIDE ADJUSTMENT” on page14.)
18. Assemble unit in reverse order of separation. Tighten all hardware to standard torque specifications.

924DE and 1128DE—

1. Park snowblower, tip machine onto auger housing, and remove access panel. (See “IMPELLER BRAKE ADJUSTMENT” on page10 for procedure.).
2. Tip unit back to operating position.



3. Remove two cap screws (A) and remove belt cover (B).

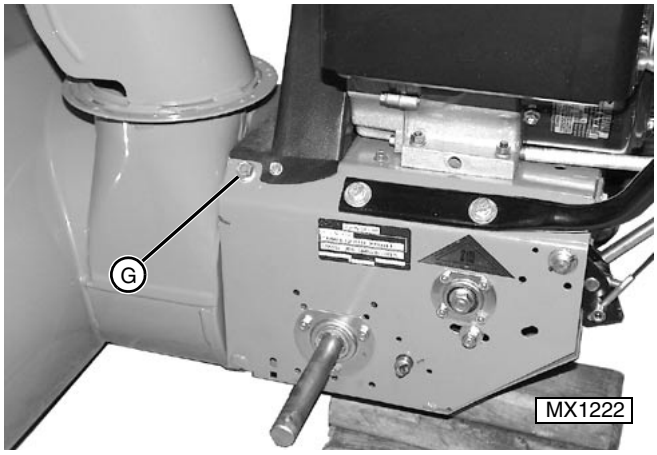


4. Remove cotter pin (or quick pull pin) (C) from chute crank rod (D).
5. Slide chute crank rod from chute gear assembly (E).
6. Remove attaching hardware (F).
7. Remove and set aside the chute.

⚠ CAUTION

Make sure drive unit is supported before removing any fasteners. Drive unit will be unbalanced and fall backwards if not supported.

8. Find a support to rest handlebars on when drive is split.



Left Side Shown – Wheel Removed For Clarity

9. Remove two upper cap screws (G) while holding engine frame stationary.

IMPORTANT: Lean engine frame back only far enough to expose the auger drive belt. DO NOT over-stretch deflector chute cable.

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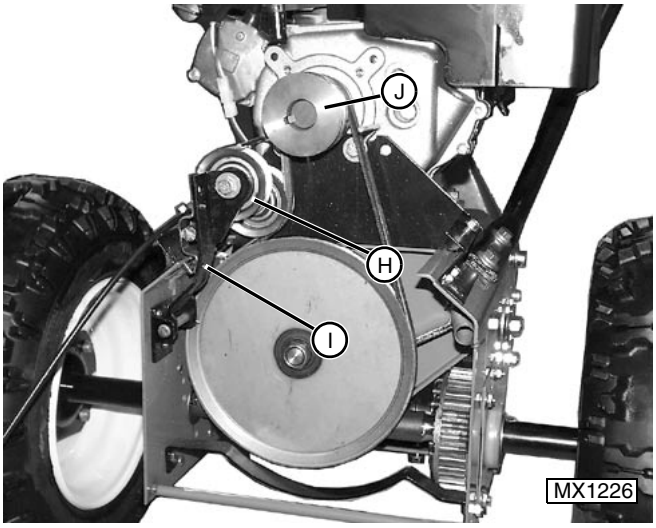
10. Rest handle bars on support stand.



Auger Assembly Removed For Clarity

11. Loosen the auger drive belt idler (H).
12. Remove auger drive belt and install new belt. It is necessary to hold back the clutch arm/brake (I) to remove and install the belt.
13. Put unit back together and tighten the auger housing cap screws.
14. Install auger drive belt onto engine sheave (J).
15. Check alignment of drive and driven sheaves. (See “BELT ALIGNMENT PROCEDURE” on page10.)
16. Check auger drive belt tension and adjust if necessary. (See “AUGER DRIVE BELT TENSION ADJUSTMENT” on page13.)
17. Assemble unit in reverse order of separation. Tighten all hardware to standard torque specifications.

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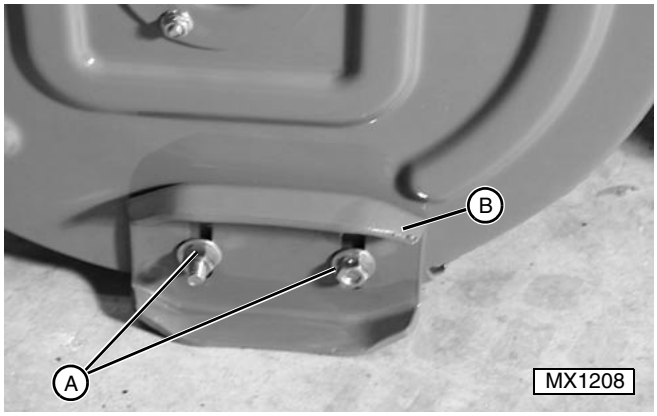
SKID PLATE REPLACEMENT

Procedure:

1. Disconnect spark plug lead.
2. Support the auger housing with a block or suitable support.

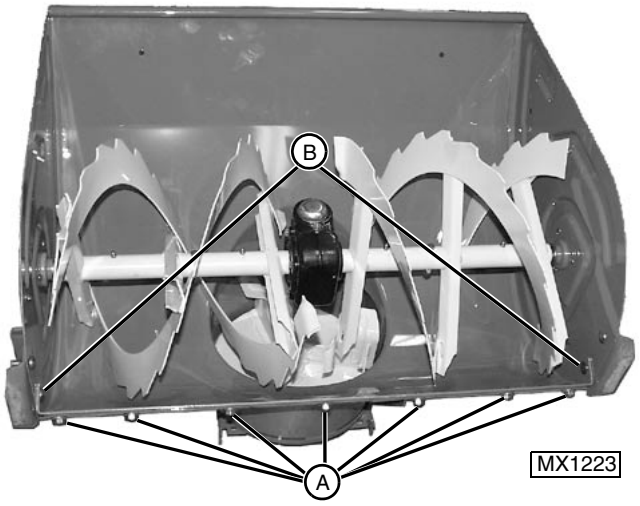


3. Remove two flange nuts (A), and remove skid plate (B).
4. Install skid plate and hardware.
5. Adjust both skid plates to the same height. (See “SKID PLATE ADJUSTMENT” on page15.)
6. Remove support block and connect spark plug lead.

SCRAPER BLADE REPLACEMENT

Procedure:

1. Disconnect spark plug lead.
2. Tilt unit back on to handlebars.



1332DDE Model shown (other models similar)

3. Remove seven nuts, washers and carriage bolts (A) securing scraper blade to housing.

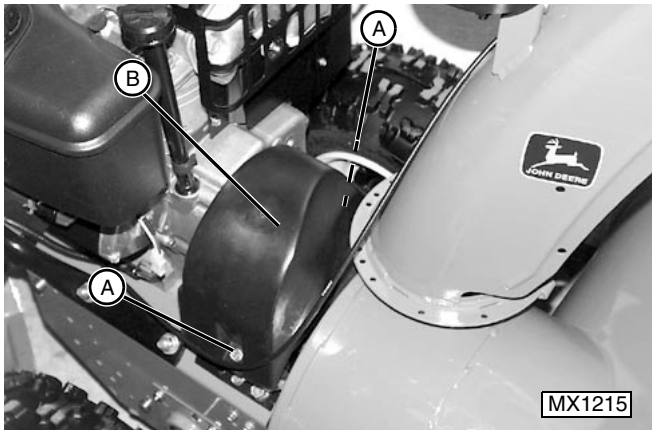
4. Remove nuts, washers and carriage bolts (B) from rear mounting point of both skids.
5. Replace blade; install hardware.
6. Adjust blade position. (See “SCRAPER BLADE ADJUSTMENT” on page15.)
7. Tilt unit back on skids, and connect spark plug lead.

DRIVE/AUGER HOUSING

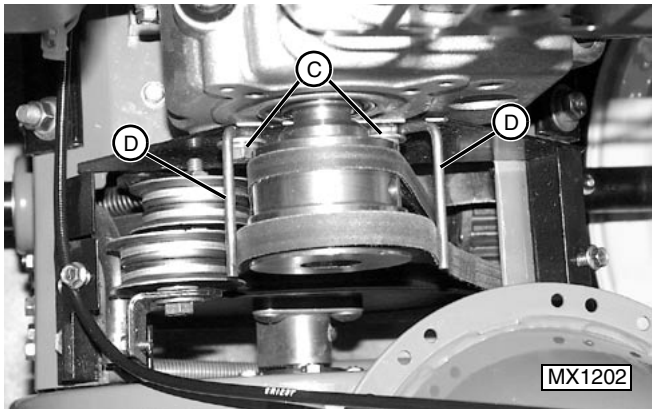
Separation:

1332DDE—

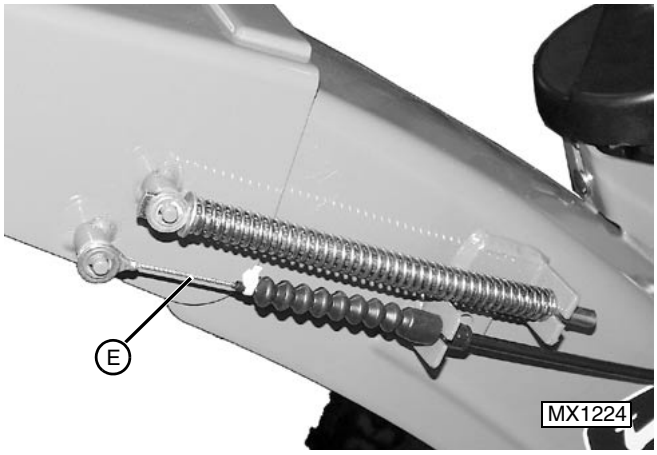
1. Park snowblower on a hard, smooth surface, tip machine onto auger housing, and remove access panel. (See “IMPELLER BRAKE ADJUSTMENT” on page10 for procedure.)
2. Tip unit back to operating position, and remove chute crank rod and attaching hardware. (See “AUGER DRIVE BELT REPLACEMENT” on page 17 for procedure.)



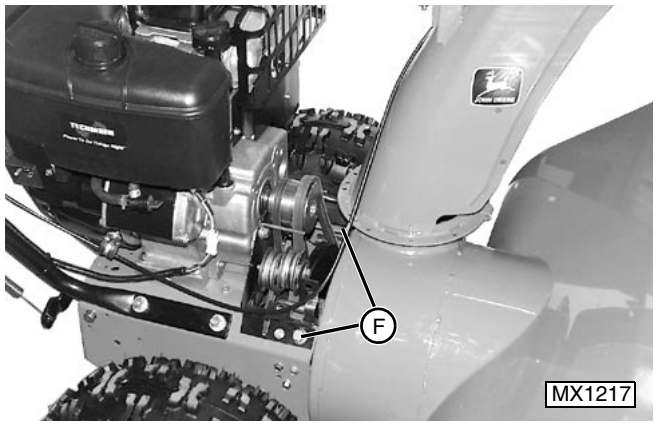
3. Remove two cap screws (A) and belt cover (B).



4. Remove cap screws (C) to loosen belt guides (D).
5. Move belt guides enough to remove auger drive belt from engine drive sheave.



6. Remove deflector chute cable (E) at discharge chute. (See “DEFLECTOR CHUTE CABLE REMOVAL—1128DE, 1128DDE, and 1332DDE” on page16.)
7. Use a support stand to rest handlebars on when drive is split.



8. Remove two cap screws (F) while holding engine frame stationary.

9. Rest handle bars on support stand.
10. Remove blower chute.

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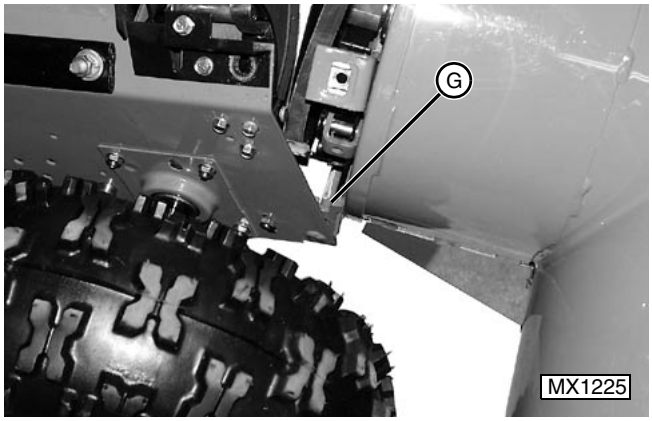
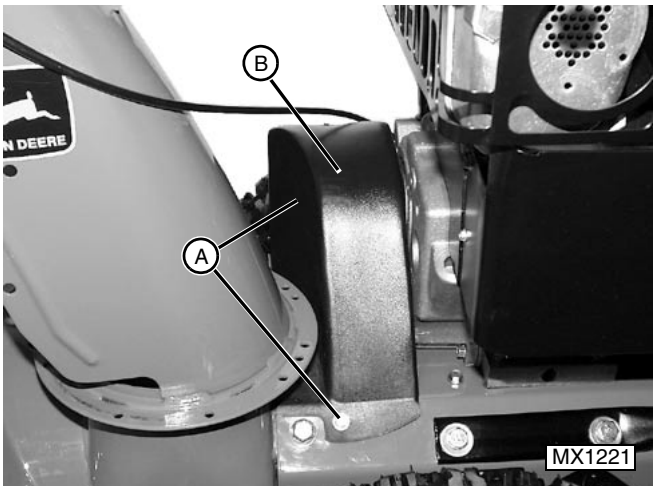


11. Lift auger housing off pivot rod (G) of drive unit, and slide auger housing away from drive unit.

924DE, 1128DE, & 1128DDE—

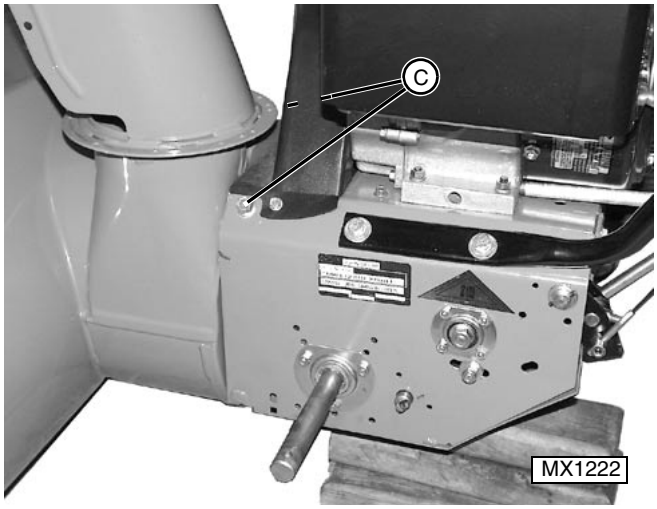
1. Park snowblower, tip machine onto auger housing, and remove access panel. (See “IMPELLER BRAKE ADJUSTMENT” on page10 for procedure.)
2. Tip unit back to operating position, and remove chute crank rod and attaching hardware. (See “AUGER DRIVE BELT REPLACEMENT” on page 17 for procedure.)



3. Remove two cap screws (A), and remove belt cover (B).
4. Disconnect auger drive belt from engine sheaves.
5. Remove blower chute.

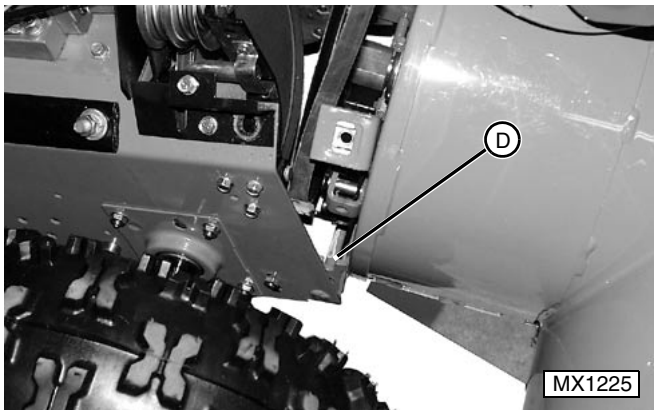
⚠ CAUTION

Make sure drive unit is properly supported before removing any fasteners. Drive unit will be unbalanced and fall backwards if not supported.



Left Side Shown – Wheel Removed For Clarity Only

6. Remove two upper cap screws (C) and slowly lean engine frame back onto support stand.

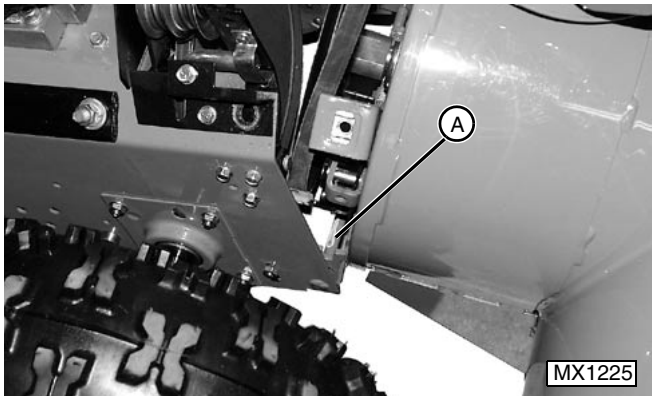


7. Lift auger housing off pivot rod (D) of drive unit, and slide the auger away from the power unit.

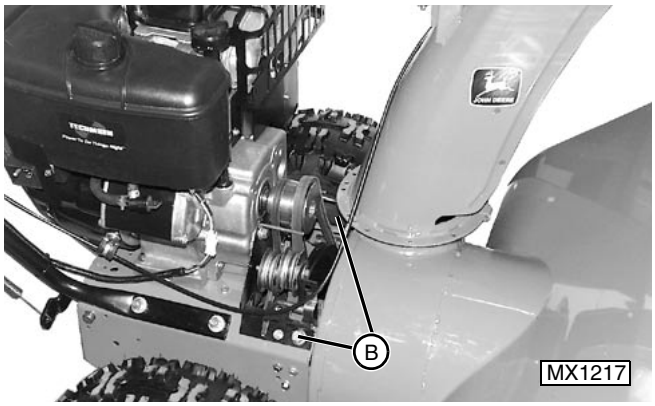
M

Assembly:

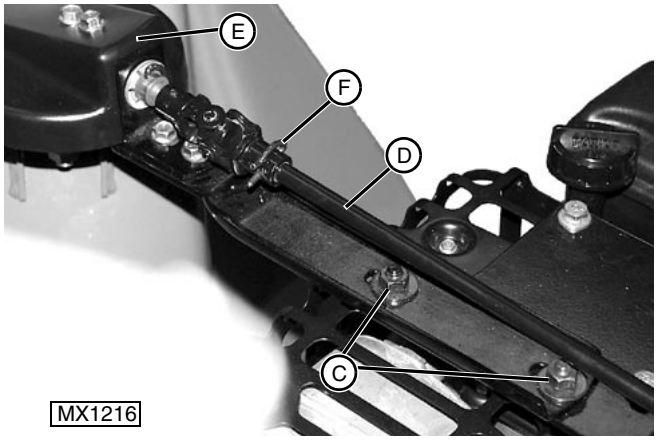
1332DDE—



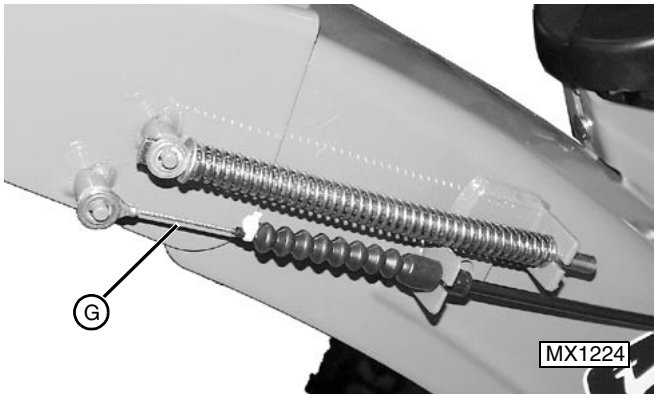
1. Align auger housing with drive housing.
2. Hook lower end of auger housing on rod (A) at bottom of drive housing.



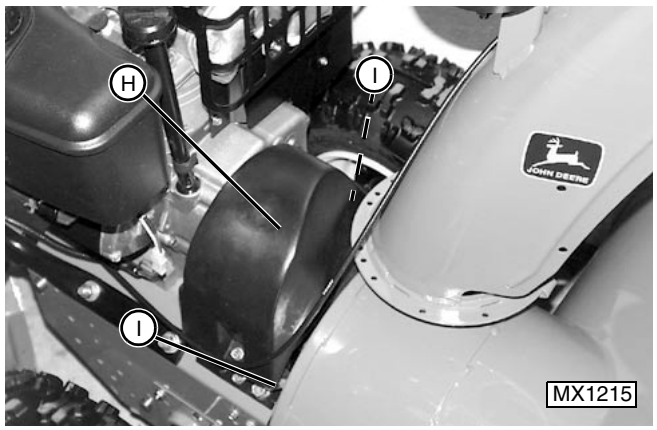
3. Tilt drive unit up and secure with two cap screws (B). Tighten cap screws to **standard torque specifications**.
4. Install and adjust auger drive belt. (See appropriate alignment and tensioning procedures earlier in this section.)
5. Adjust belt guides to a clearance of **3 mm (0.125 in.)** to belt, and tighten cap screws to **standard torque specifications**.



6. Install attaching hardware (C) and tighten to standard torque specifications.
7. Slide chute crank rod (D) into chute gear assembly (E).
8. Install cotter pin (or quick pull pin) (F) into chute crank rod.

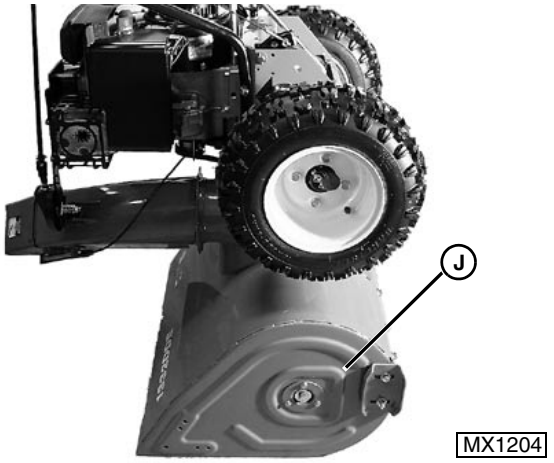


9. Reconnect deflector chute control cable (G). (See appropriate procedures earlier in this section.)

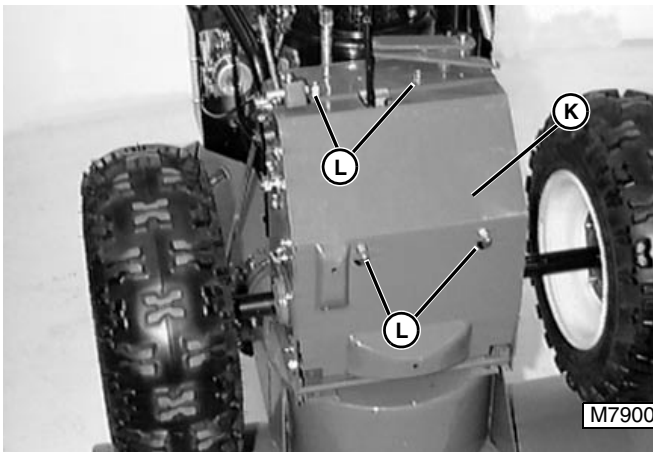


10. Install belt cover (H) and fasten with cap screws (I).

M



11. Tip machine forward onto auger housing (J).

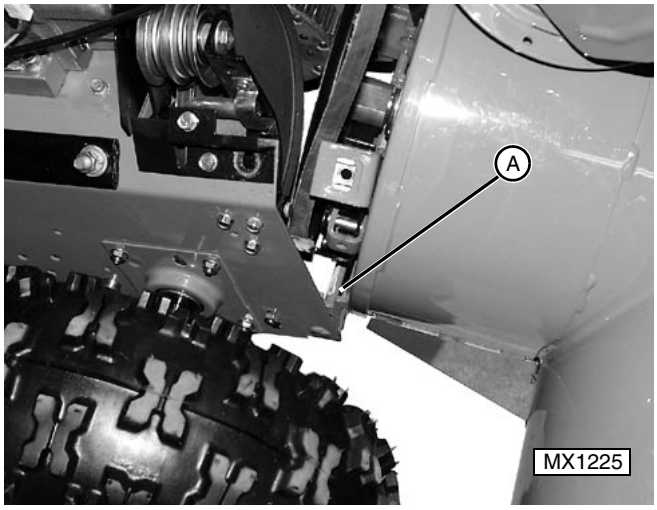


12. Install access panel (K). Fasten with hardware (L).
13. Tip unit back to normal position.

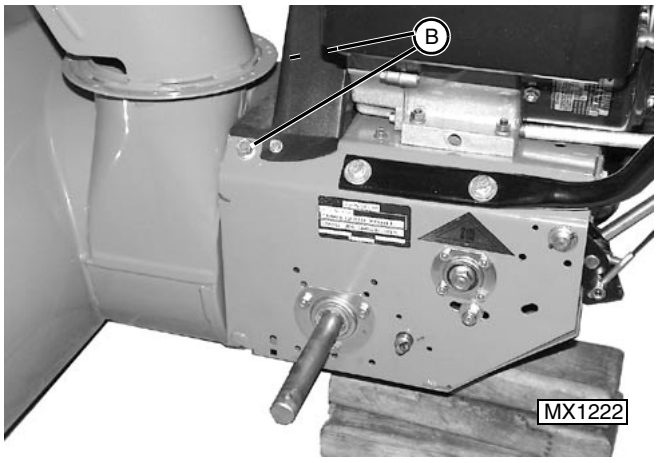
924DE, 1128DE, & 1128DDE—

> **⚠ CAUTION**
>
> **Make sure drive unit is properly supported before assembly begins. Drive unit will be unbalanced and fall backwards if not supported.**

1. Align auger housing with drive housing.

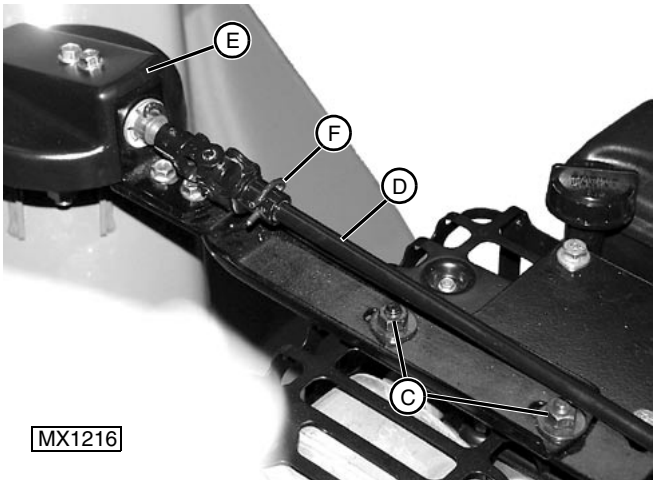


2. Hook lower end of auger housing on rod (A) at bottom of drive housing.

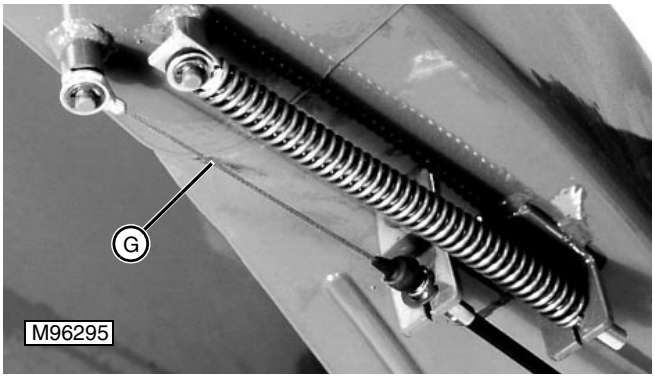


3. Tilt drive unit up and secure with two cap screws (B). Tighten cap screws to **standard torque specifications**.
4. Install and adjust auger drive belt onto engine sheave. (See appropriate belt alignment and tensioning procedures earlier in this section.)
5. Adjust belt guides to a clearance of **3 mm (0.125 in.)** to belt, and tighten cap screws to **standard torque specifications**.
6. Install belt cover and fasten with cap screws.
7. Install chute onto blower housing.

M



8. Install and tighten attaching hardware (C) to standard torque specifications.
9. Slide chute crank rod (D) into chute gear assembly (E).
10. Install cotter pin (or quick pull pin) (F) into chute crank rod.

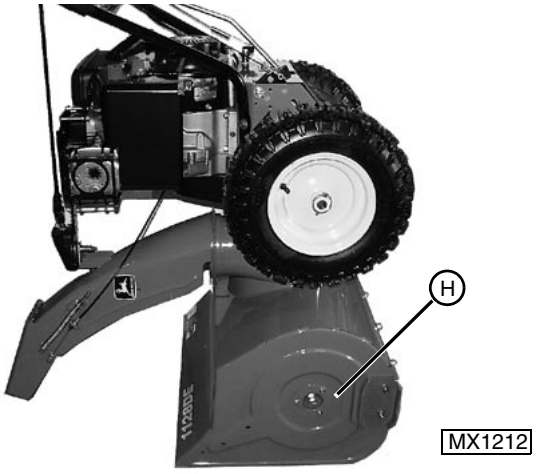


1128DE, and 1128DDE models only

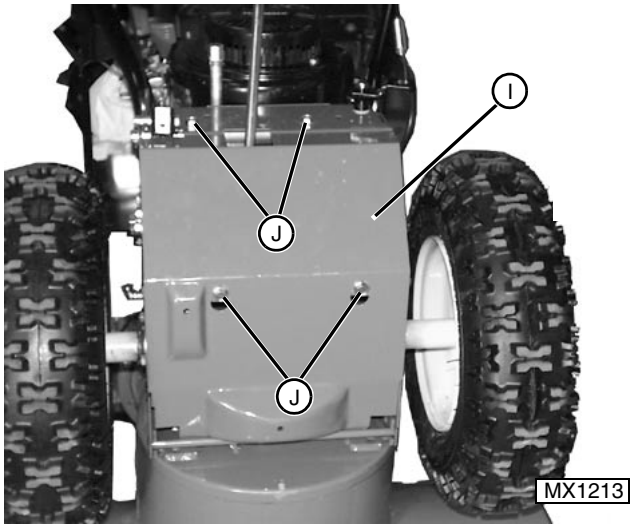
11. Install deflector chute cable (G) onto discharge chute. (See appropriate installation and adjusting procedures earlier in this section.)

⚠ CAUTION

Remove enough fuel from fuel tank so that no spillage will occur when unit is tipped up onto housing. Gasoline is extremely flammable. DO NOT SMOKE. Always work in a well ventilated area away from open flame or spark producing equipment.



12. Tip machine forward onto auger housing (H).



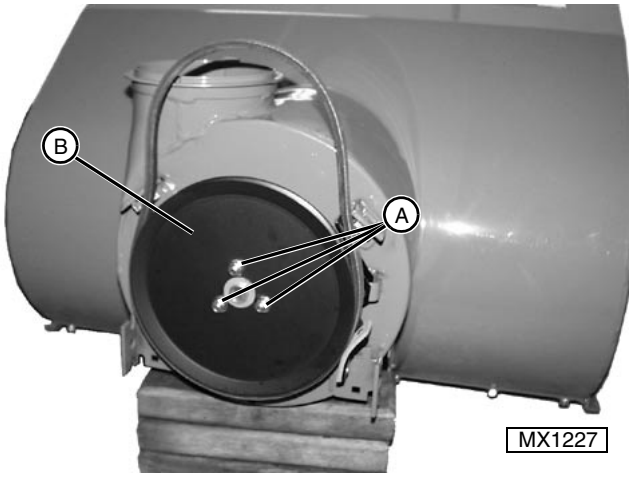
13. Install access panel (I) and fasten with hardware (J).
14. Tip unit back to normal position.

M

BLOWER AND AUGER DISASSEMBLY

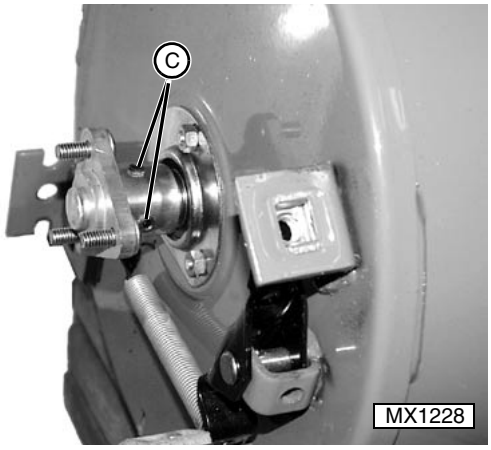
Procedure:

1. Separate blower/auger housing from engine friction drive assembly. (See “DRIVE/AUGER HOUSING” on page21.)
2. Place blocking under impeller housing to hold it up.
3. Remove belt.

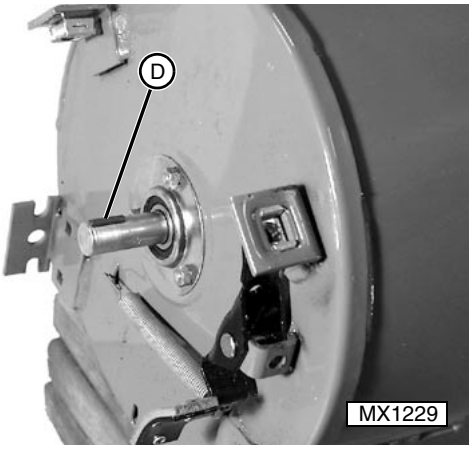


1332DDE Model shown (other models similar)

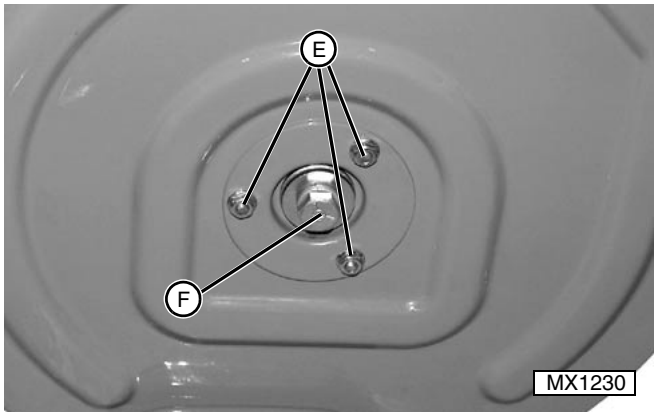
4. Remove three nuts (A) securing sheave (B) to hub.
5. Remove sheave.



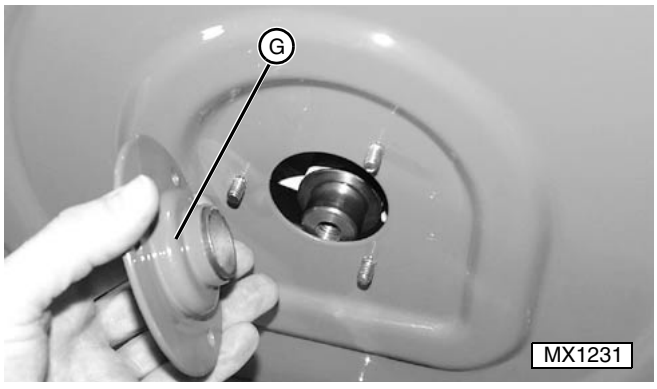
6. Loosen set screws (C) on hub.
7. Remove hub from impeller shaft.



8. Remove key (D) from impeller shaft.



9. Remove three flange nuts (E) securing auger shaft bearing to housing.
10. Remove cap screw, lock washer and flat washer (F) from end of auger shaft.



11. Remove bearing plate (G).
12. Repeat steps 9 though 11 on other side of auger.

M

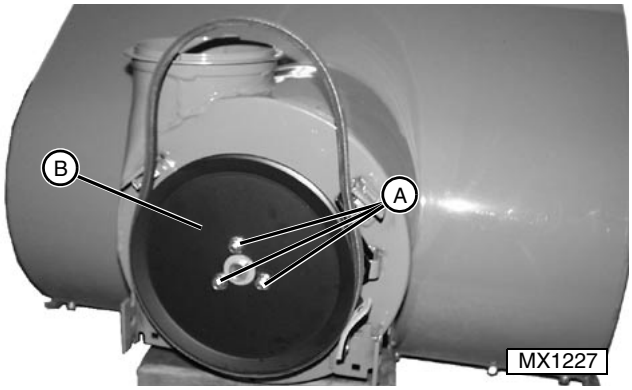
1332 Model shown (other models similar)

13. Pull auger assembly from housing.

IMPELLER BEARING

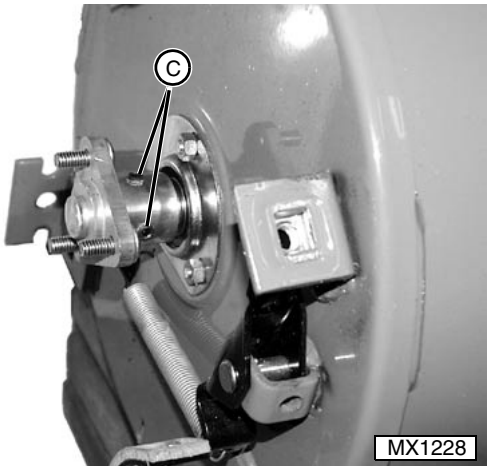
Removal:

1. Separate auger housing from drive housing. (See "DRIVE/AUGER HOUSING" on page21.)
2. Place blocking under impeller housing to hold it up.
3. Remove belt.

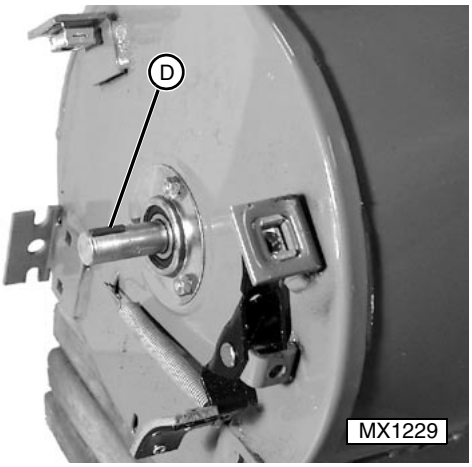


1332DDE Model shown (other models similar)

4. Remove three lock nuts (A) securing sheave to hub.
5. Remove sheave (B).



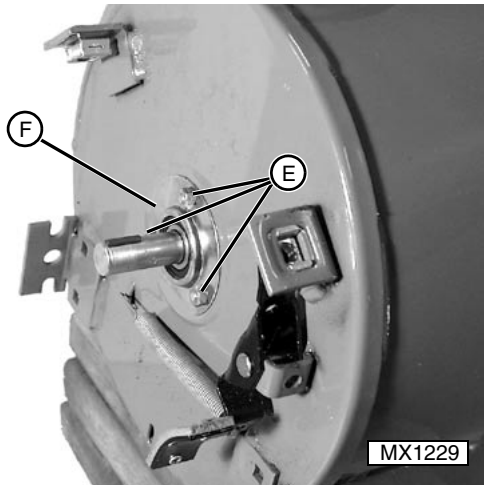
6. Loosen set screws (C) on hub.
7. Remove hub from impeller shaft.



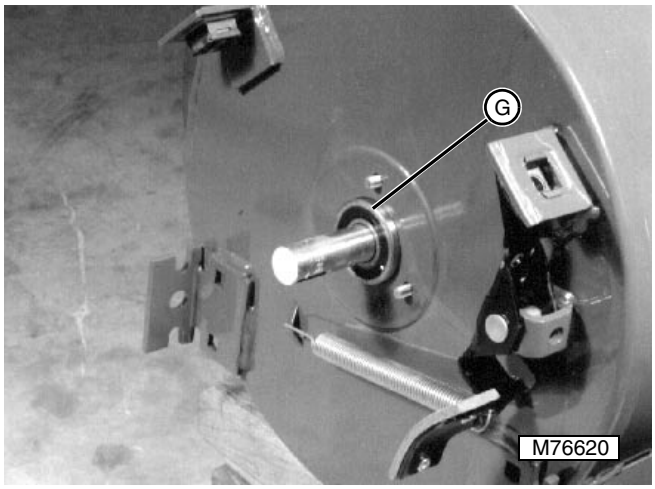
8. Remove key (D) from impeller shaft.

NOTE: It may be possible to remove bearing without disassembling auger unit from housing. Bearing is "slip fit" to auger shaft. If bearing is not easily removable, auger unit must be removed and bearing pressed from shaft. (See "BLOWER AND AUGER DISASSEMBLY" on page 26.)

M



9. Remove lock nuts (E) from bearing retainer (F).
10. Clean impeller shaft thoroughly. Remove all paint rust and burrs from set screws. Use fine cut file to remove burrs.



11. Remove bearing (G).

Installation:

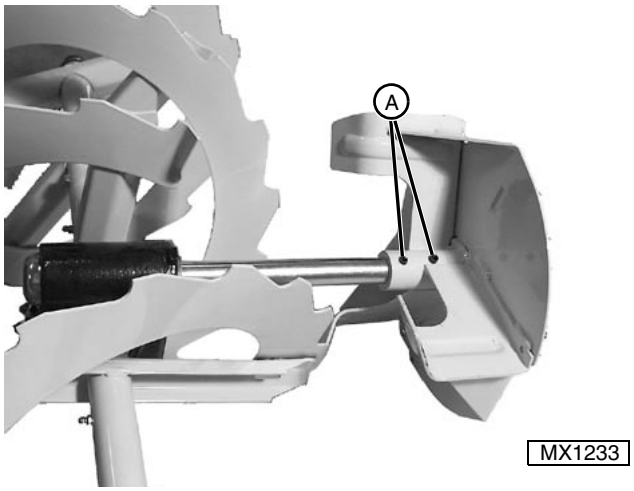
1. Slide new bearing onto shaft.
2. Install bearing plate and lock nuts. Tighten lock nuts to **12 N•m (106 lb-in.)**.

M

AUGER DISASSEMBLY

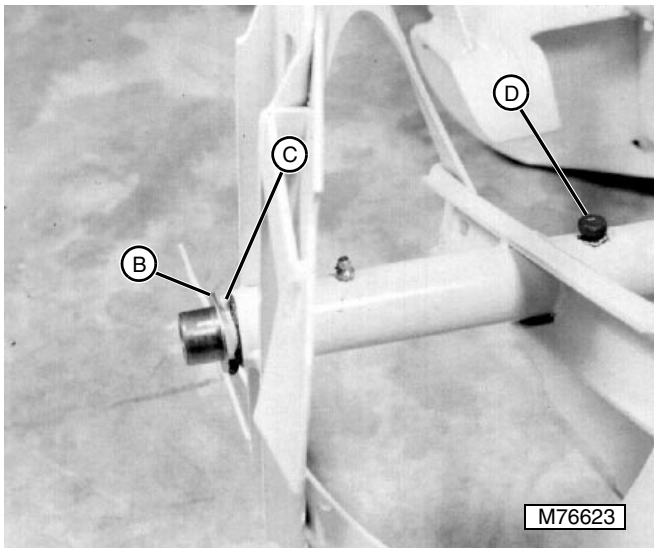
Procedure:

1. Remove auger assembly from auger housing. (See “BLOWER AND AUGER DISASSEMBLY” on page 26.)



1332DDE Model shown (other models similar)

2. Drive two roll pins (A) out to remove second stage impeller from impeller shaft.

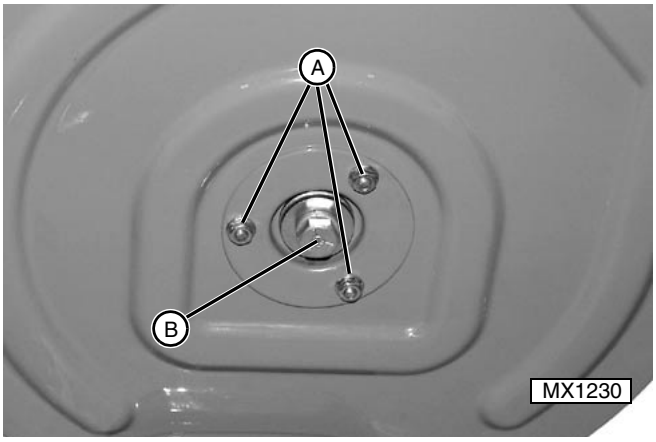


3. Remove outside washer(s) (B), rolled spring pin (C), and shear bolt and nut (D).
4. Slide auger from end of shaft and mark from which side it was removed for later assembly.
5. Repeat steps two through four for other auger.

AUGER SHAFT BUSHING REPLACEMENT

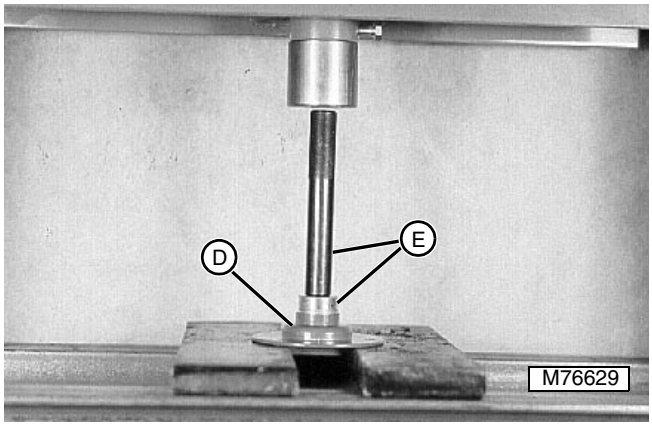
Procedure:

NOTE: Bushings can be replaced without removing auger.

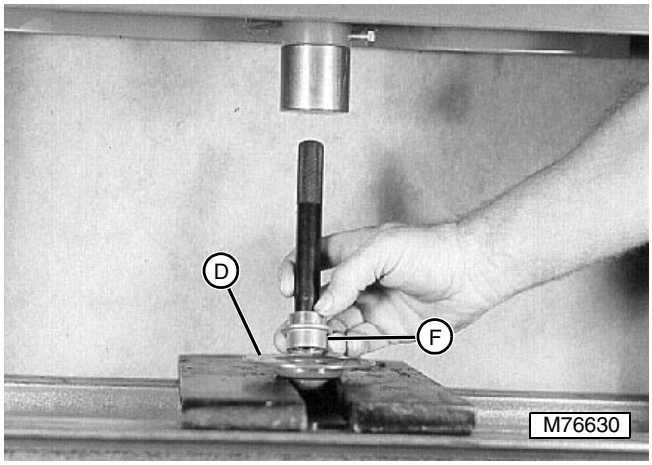


1. Remove three flange nuts (A) securing auger shaft bushing to housing.
2. Remove cap screw, lock washer and flat washer (B) from end of auger shaft.

3. Remove bushing plate (C).



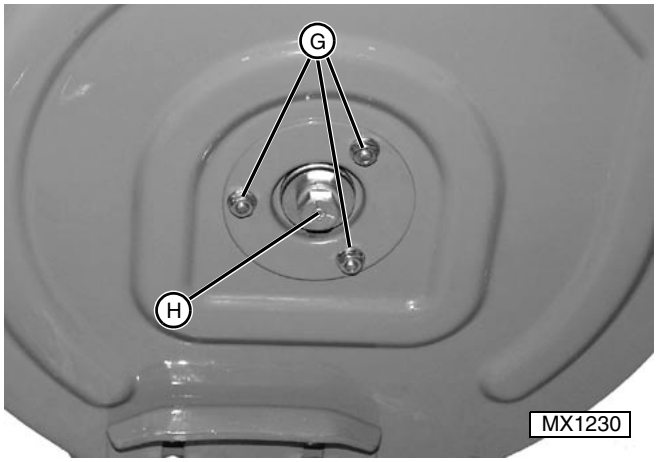
4. Press bushing from plate (D) using a suitable driver (E).



5. Press new bushing (F) into bushing plate (D).

NOTE: When installing new bushing make sure that flange is on "outside" of bearing plate.

6. Oil bushing with motor oil and install in auger housing.



M

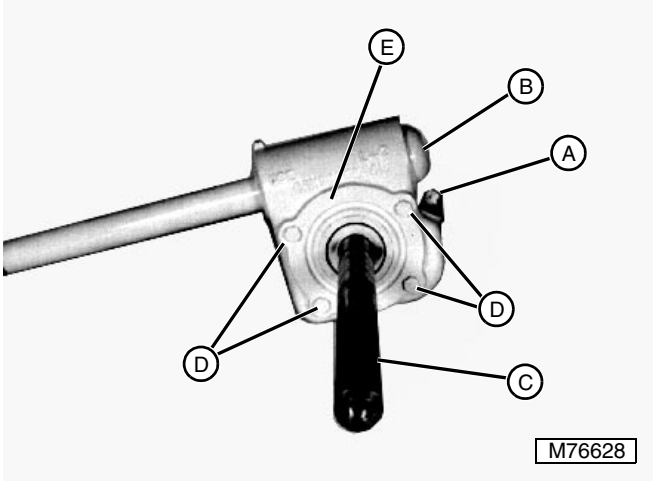
7. Secure each plate with three lock nuts (G) and tighten to **12 N•m (106 lb-in.)**.
8. Install cap screw (H) with lock washer, and flat washer to each end of cross shaft and tighten to **70 N•m (52 lb-ft)**.

AUGER GEARBOX

Disassembly:

1128DDE and 1332DDE—

1. Remove auger assembly. (See "BLOWER AND AUGER DISASSEMBLY" on page26.)
2. Disassemble auger. (See "AUGER DISASSEMBLY" on page28.)



3. Remove drain plug (A), and drain oil from auger gear case.

NOTE: It is not necessary to remove input shaft end cap (B) to disassemble gear case.

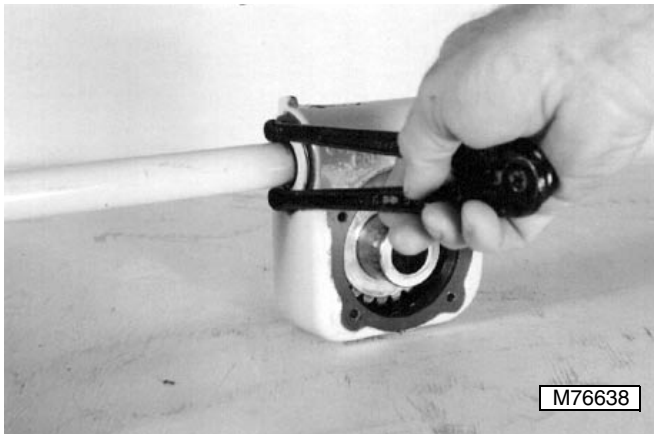
4. Remove auger shaft (C) from gear box.

NOTE: It may be necessary to drive shaft out of center of gear box. Support gear box and use soft face mallet to drive out shaft.

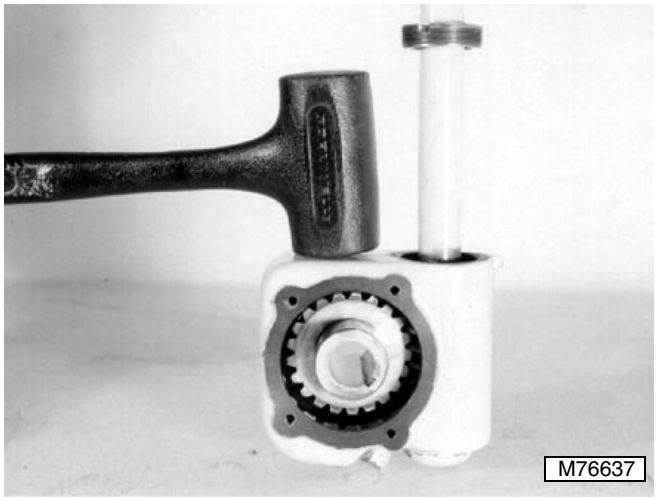
5. Remove four cap screws (D) securing cover plate to gear case.

NOTE: Bronze gear cannot be removed at this time.

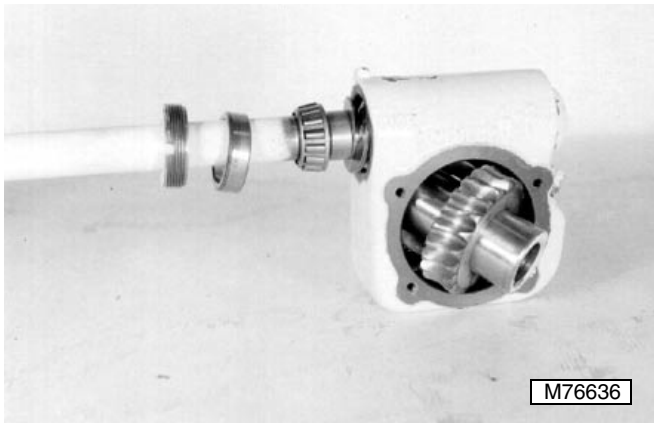
6. Remove cover (E).



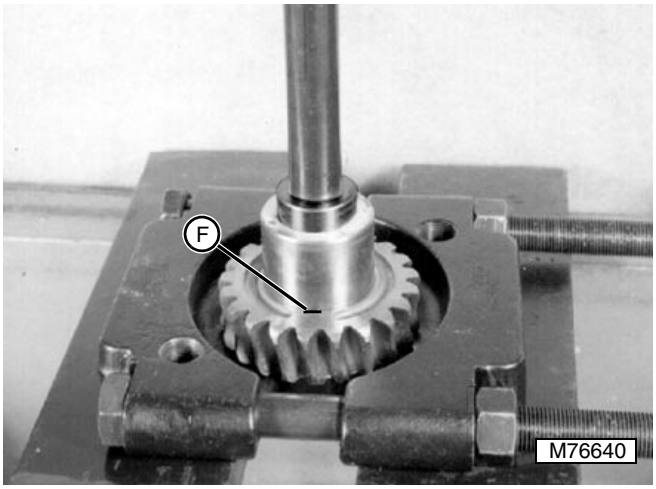
7. Remove adjustment plug using adjustable spanner wrench.



8. Hold input shaft and tap gear case until bearing cone pops out of case.



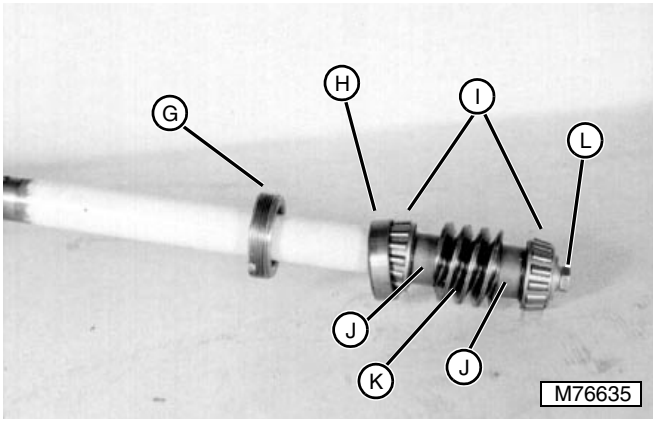
9. Simultaneously remove input shaft assembly and bronze gear from gear case.
10. Remove input shaft, gear, and bearings from gear case.



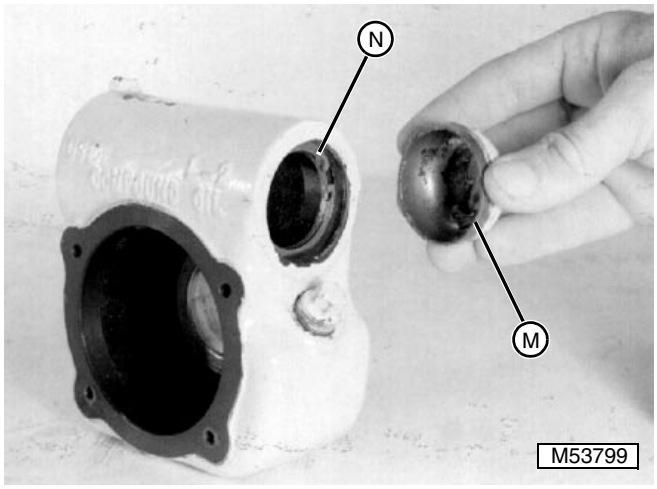
IMPORTANT: When pressing bronze gear make sure that gear is supported properly.

Gear is keyed to shaft. When pressing shaft out of gear make sure that key (F) does not interfere with supports.

11. Press old gear off shaft.



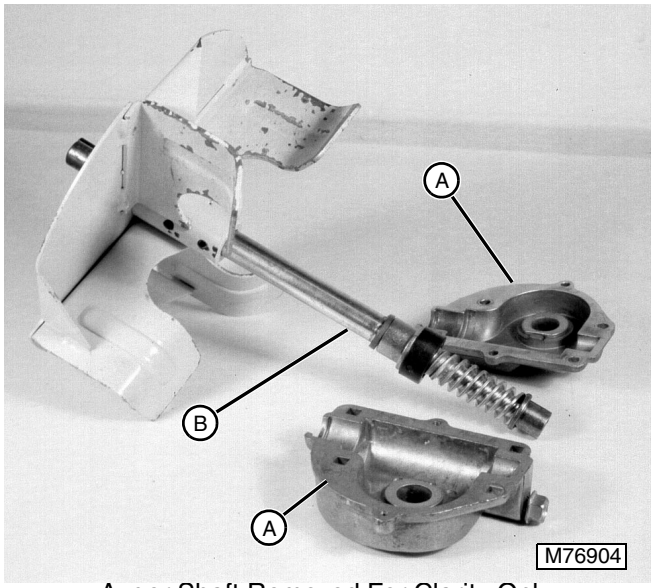
12. Remove adjustment nut (G). Cup (H), bearings (I), spacers (J), and worm gear (K) can be removed from input shaft by removing cap screw, lock washer, and flat washer (L) on end of shaft.



13. Cup for front bearing can be replaced by removing the end cap (M) from the end of the gear case then removing the C-clip (N) and driving the cup out the front of the gear case.

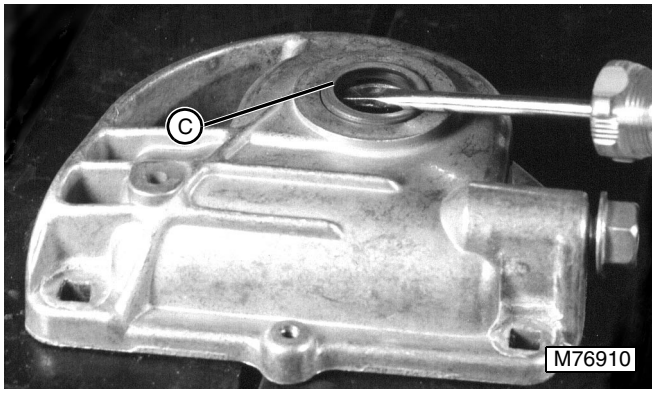
924DE and 1128DE—

1. Remove and disassemble auger assembly. (See “BLOWER AND AUGER DISASSEMBLY” on page 26.)



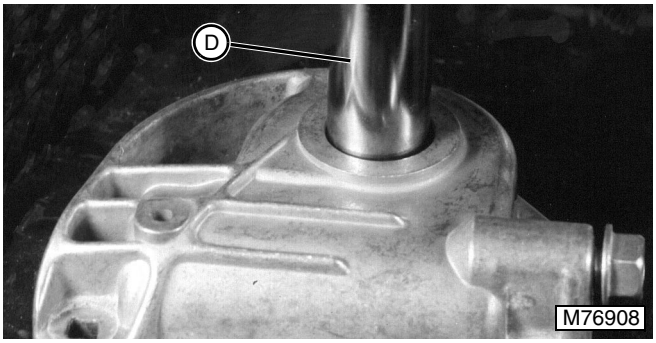
Auger Shaft Removed For Clarity Only

2. Remove four carriage bolts and two self tapping screws. Remove case halves (A) from impeller shaft (B).

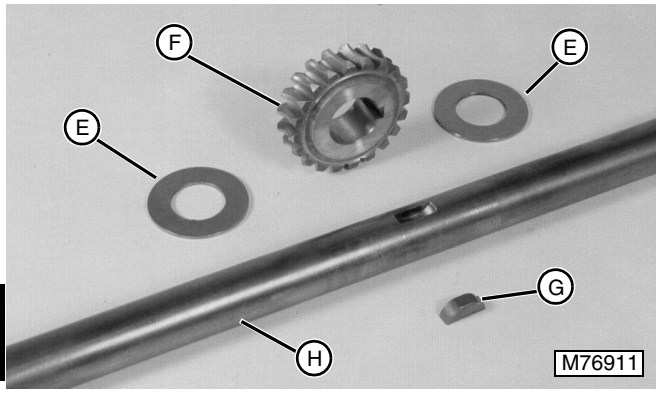


3. Remove seals (C) from left and right case halves with a screwdriver.

NOTE: Seals must be removed before the bushings can be removed.

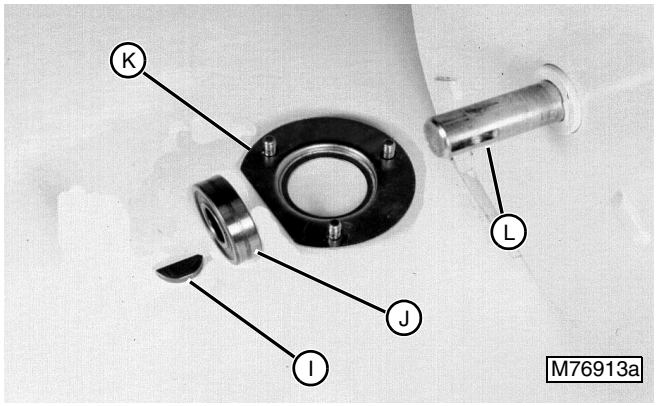


4. Remove bushings from the case halves with a suitable bearing driver (D).

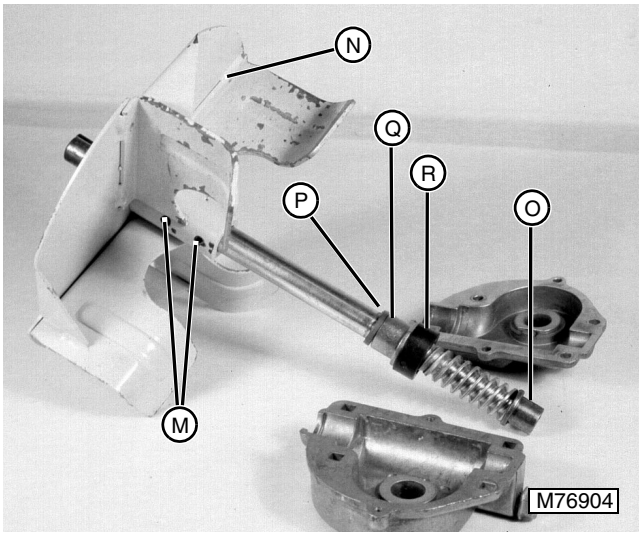


IMPORTANT: It may be necessary to tap the gear to loosen it from the shaft and key. Use caution to avoid damaging the gear and shaft.

5. Remove washers (E), gear (F) and key (G) from the auger shaft (H).



6. Remove the key (I), bearing (J), and bearing flange (K) from the back of the impeller shaft (L).



7. Remove two spring pins (M) and the impeller (N) from the impeller shaft.
8. Remove front bushing (O) from the impeller shaft.

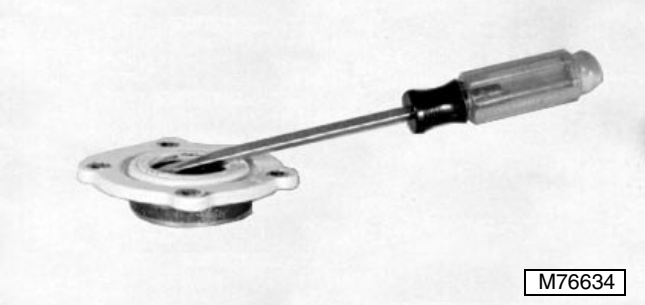
NOTE: The thrust collar is held in place by a groove pin. Drive the pin out of the collar in the direction of least resistance.

9. The seal (P), rear bushing (Q) and thrust collar (R) can now be removed from the rear of the impeller shaft.

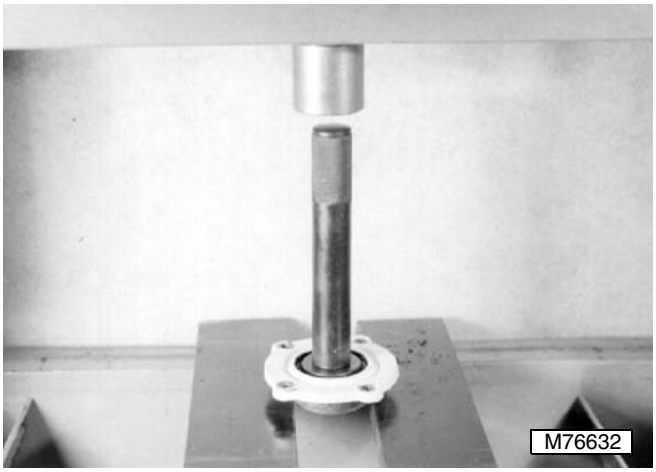
M

Inspection:

1128DDE and 1332DDE—



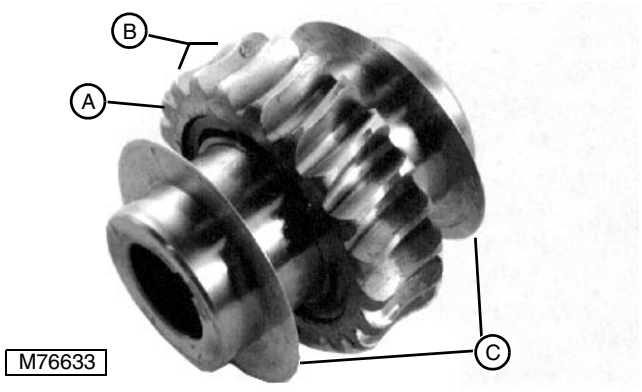
1. Inspect oil seals in gear housing and housing cover for wear or damage. If replacement is required remove seal using screwdriver.



2. Inspect flange bearings in gear case and cover. If replacement is necessary use bearing press to remove bearing.

NOTE: Seal must be removed before attempting to remove the flange bearing.

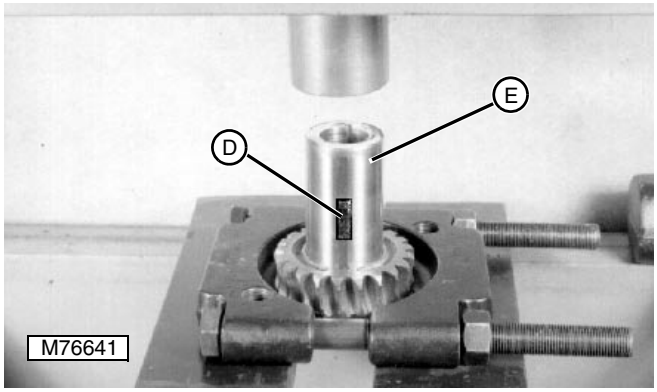
3. Clean sealant from cover surfaces and check surfaces for nicks or distortion that could cause leaks.



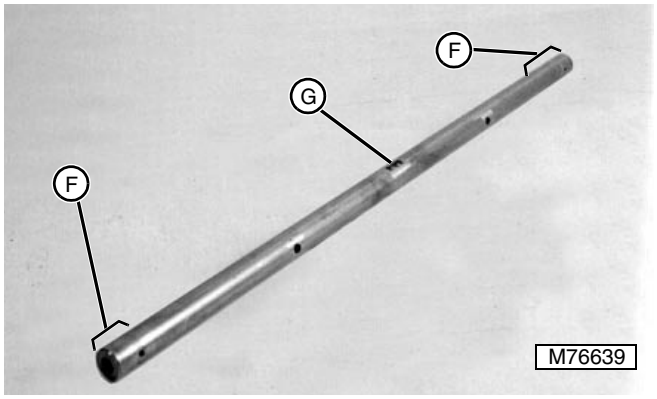
4. Inspect bronze gear (A) for worn, broken or cracked teeth.

NOTE: Depression (B) in center of gear face is normal.

5. Inspect washers (C) and replace if scored or scratched.



6. Inspect key (D), gear, and shaft (E). Replace parts as necessary.



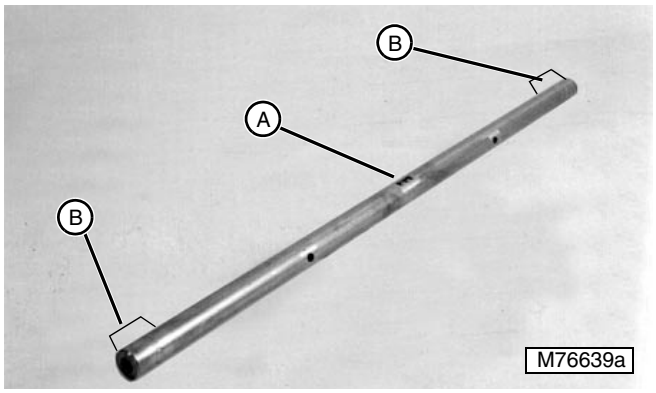
7. Clean auger shaft. Make sure paint overspray is removed from ends of shaft.

M

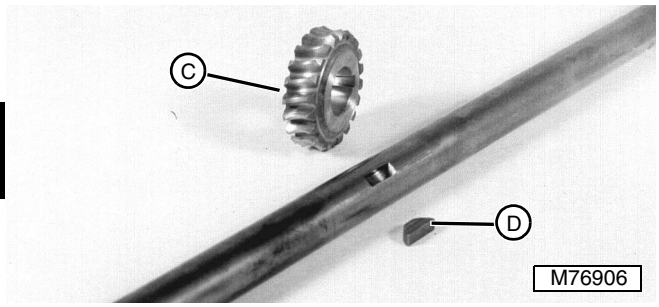
8. Inspect auger shaft for worn bearing surfaces (F), worn keyway (G), and straightness. Replace shaft if required.
9. Inspect seal in adjustment nut. Replace if necessary.
10. Inspect input shaft worm gear for chipped, worn or broken teeth.
11. Inspect roller bearings and cups for chipping, spalling, scratches or discoloration. Replace if necessary.
12. Replace worn, damaged or bent parts.

924DE and 1128DE—

1. Inspect the oil seals in the gear case for wear or damage. If required replace the seals using a screwdriver.
2. Inspect flanged bushings. Replace any bushings showing wear or damage.
3. Clean the gear case sealing surfaces and check for cracks, nicks or warpage. Replace any cover that will not seal correctly.
4. Inspect washers. Replace if worn, scored or scratched.

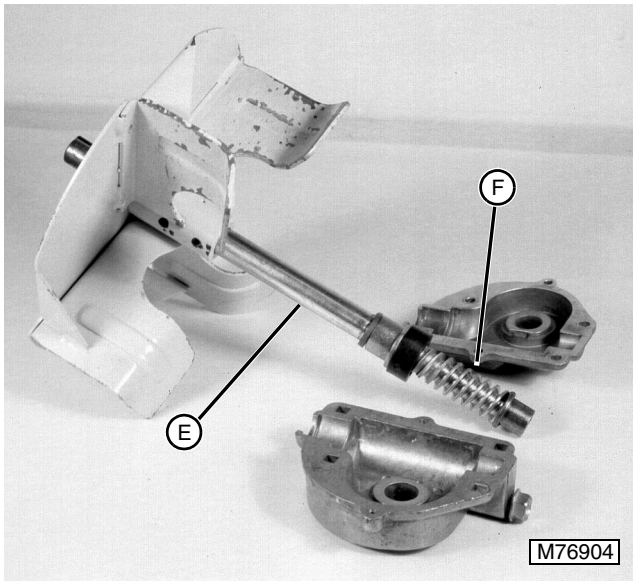


5. Inspect the auger shaft for straightness, and wear of the keyway (A) and bearing surfaces (B). Replace shaft if required.



6. Inspect the impeller gear (C) for worn, broken, cracked, or missing teeth. Inspect the shaft key (D) for wear. Replace as required.

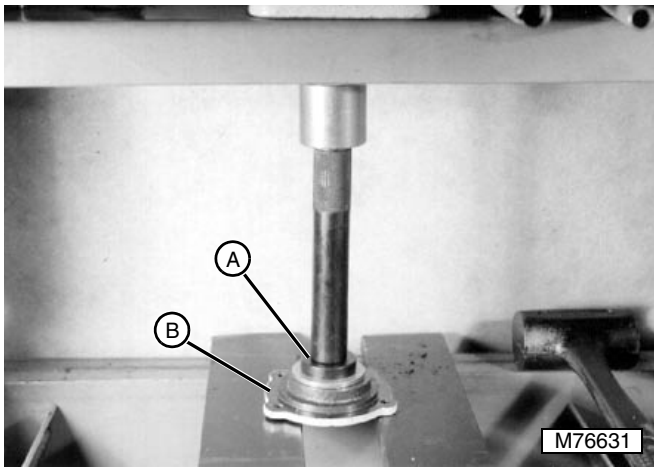
NOTE: Depression in center of gear face is normal.



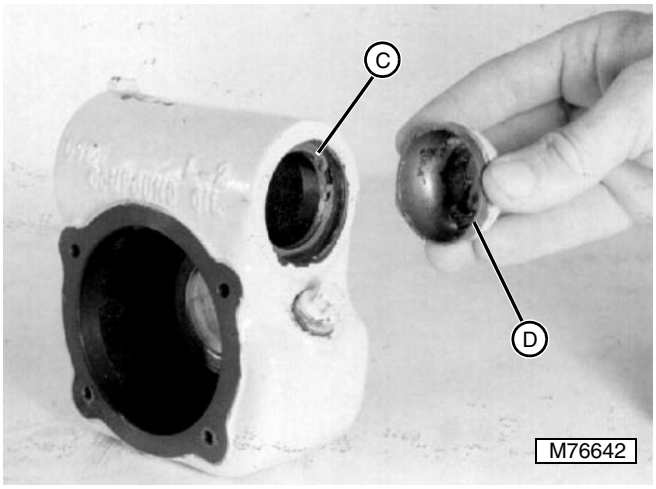
7. Inspect the impeller shaft (E) for straightness and wear. Inspect the worm gear (F) section of the shaft for missing, chipped or worn teeth. Replace if worn or damaged.

Assembly:

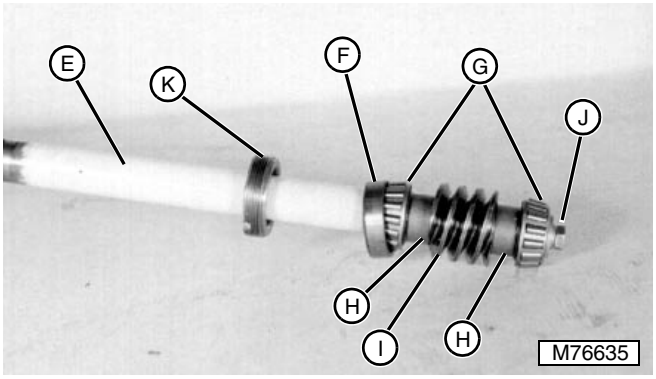
1128DDE and 1332DDE—



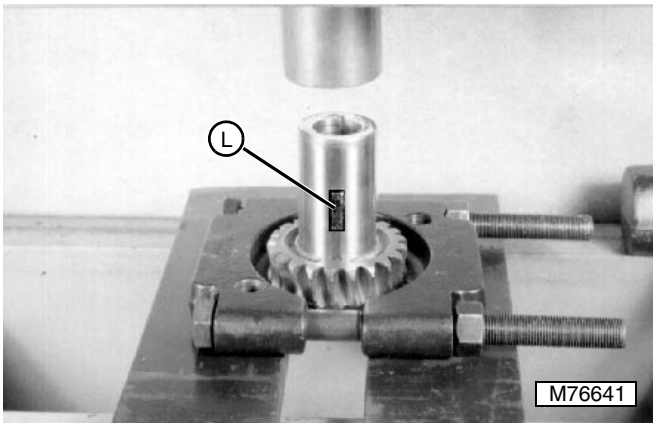
1. If required, press new bushings (A) into gear housing and cover (B).
2. Use seal driver to install seals in housing and housing cover. Install seals until flush with exterior housing surface.



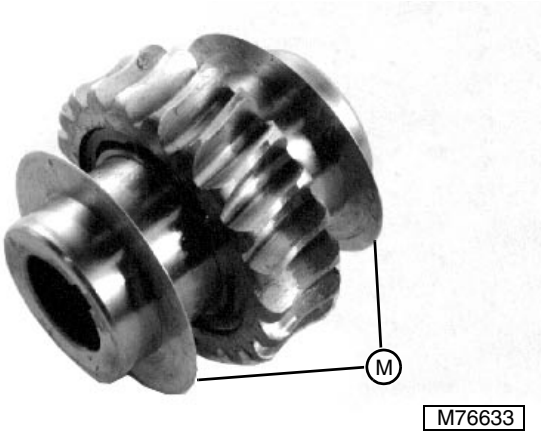
3. Replace front bearing cup. Install C-clip (C) and dust cover (D).



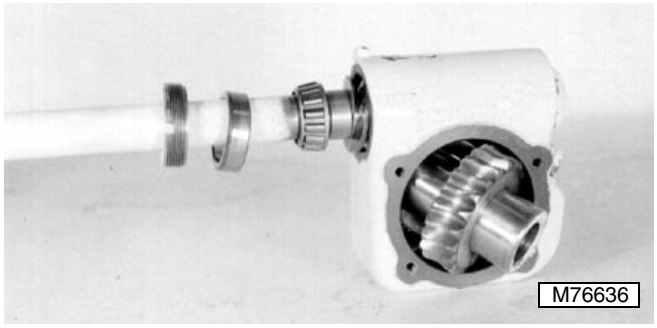
4. Assemble input shaft (E), bearing cup (F), bearings (G), spacers (H), and worm gear (I). Secure with cap screw, lock washer and flat washer (J).
5. Replace seal in adjusting nut (K) and slide on to input shaft being careful not to damage seal.



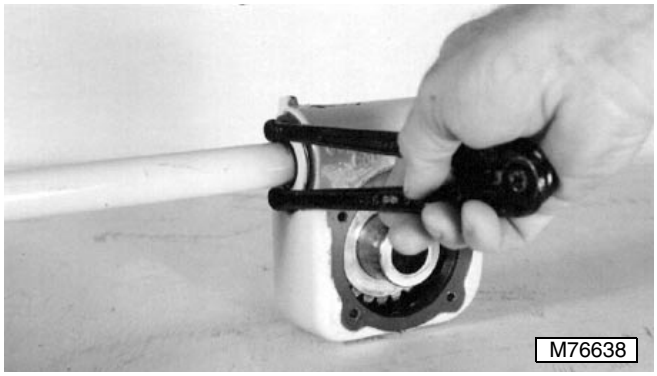
6. Align key (L) with keyway and press shaft into gear. Make sure that ends of key are below gear face when done.



7. Place washers (M) on both sides of bronze gear.



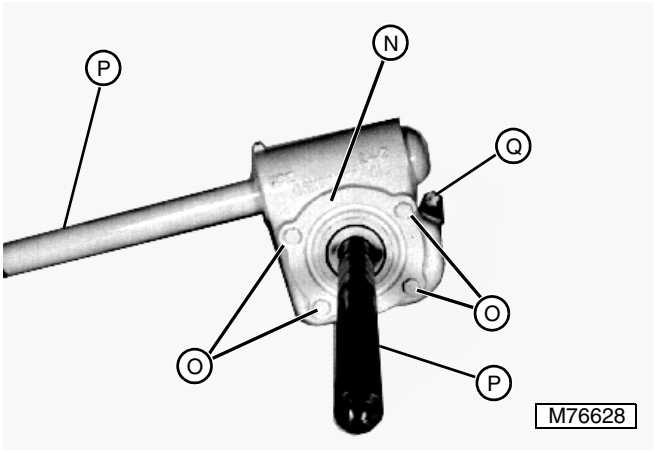
8. Lubricate seals in gear box, bronze gear, shaft bearing surfaces and washers with gear oil.
9. Lubricate input shaft bearings and worm gear with gear oil.
10. Simultaneously install bronze gear assembly and Input shaft assembly into gear box making sure gears mesh.



IMPORTANT: DO NOT overtighten adjusting nut! Adjustment is correct when all play is gone form input shaft bearings.

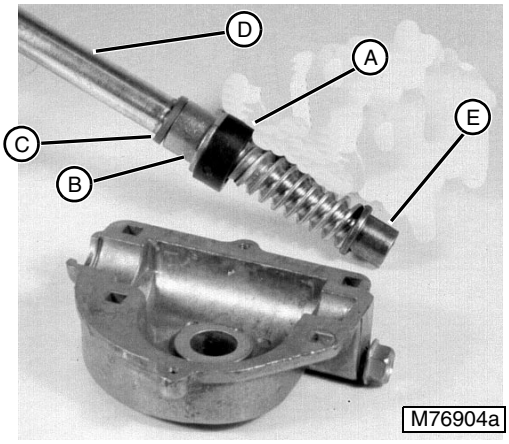
11. Use adjustable spanner wrench to tighten nut until there is no play in bearings on input shaft.

M



12. Install cover and gasket (N) on gear box.
13. Apply gasket maker to threads of bottom two cap screws.
14. Secure cover with four lock washers and cap screws (O). Tighten cap screws to **12 N•m (106 lb-in.)**.
15. Check that shafts (P) turn freely.
16. Fill gear case with proper oil. Install plug (Q).
17. Assemble blower and auger. (See “BLOWER AND AUGER ASSEMBLY” on page37.)

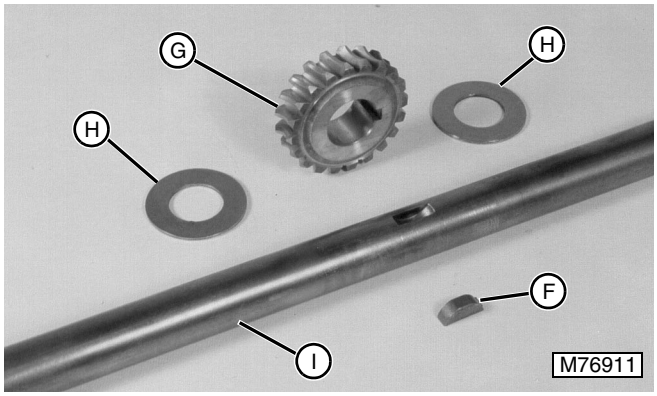
924DE and 1128DE—



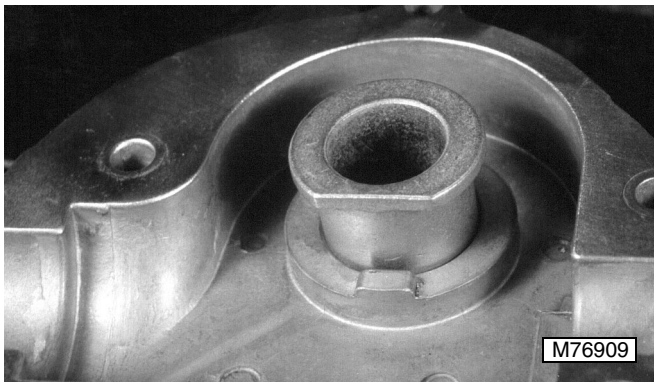
1. Install the thrust collar (A), rear bushing (B), and seal (C) to the rear of the impeller shaft (D).

NOTE: Install the thrust collar with the conferred end facing the worm gear portion of the impeller shaft.

2. Install the front bushing (E).



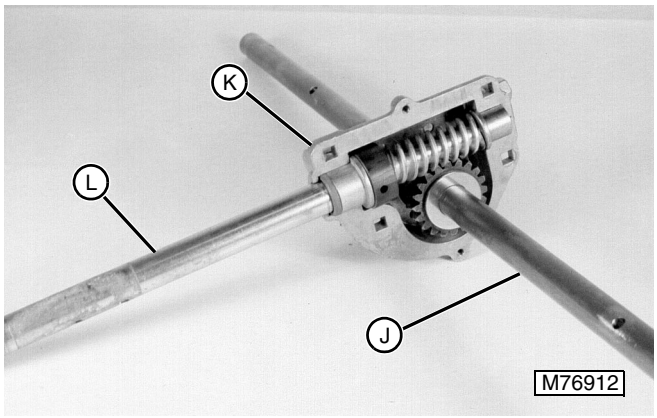
3. Install the key (F), gear (G), and washers (H) to the auger shaft (I).



NOTE: Be certain of correct bushing orientation as shown in photograph.

4. Press bushings into case halves from inside of case halves.
5. Install seals into case halves from outside.

IMPORTANT: Work in clean, dirt and dust free environment to ensure contamination free assembly.



NOTE: Maintain correct bushing orientation, as shown.

6. Apply a bead of **John Deere Ultra-Blue™ RTV Silicone Seal** to all appropriate case half mating surfaces.
7. Install assembled auger shaft (J) into left side case half (K).
8. Turn left case half and auger shaft upright through a hole in bench that accommodates diameter and exposed length of auger shaft so assembly lays flat and level.
9. Install impeller shaft (L) to left gear case half so shaft is supported to maintain a good seal between mating surfaces of bushings and left case half.
10. Fill case half with **57 ml (2 U.S. oz) John Deere GL5 gear lube**.

NOTE: It may be necessary to turn the impeller shaft clockwise to seat the case halves together.

11. Slide right half of gear case onto right side auger shaft and properly align case halves together to ensure a complete seal with mating surfaces of left case half and impeller shaft bushings.

IMPORTANT: DO NOT over-tighten carriage bolts or self-tapping screws—impeller and auger shafts should turn freely if properly assembled.

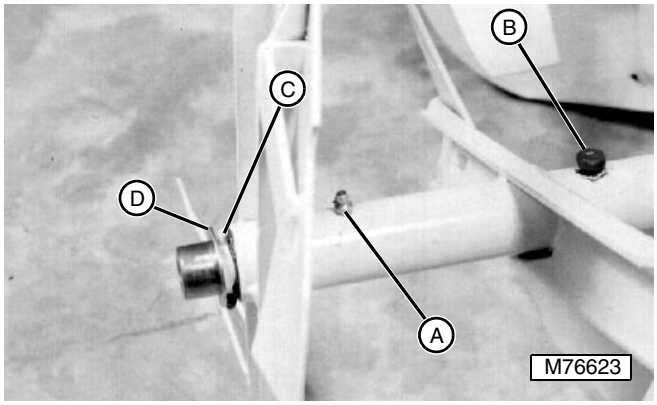
12. Fasten case halves together with four carriage bolts in a crossing pattern in increments, checking shaft rotation for free movement. Tighten carriage bolts to **9.5 N•m (84 lb-in.)**.
13. Install two self-tapping screws in like fashion. Tighten self-tapping screws to **9.5 N•m (84 lb-in.)**.
14. Install impeller onto impeller shaft.

BLOWER AND AUGER ASSEMBLY

Procedure:

1. Install each marked auger blade on its respective side of the cross shaft.

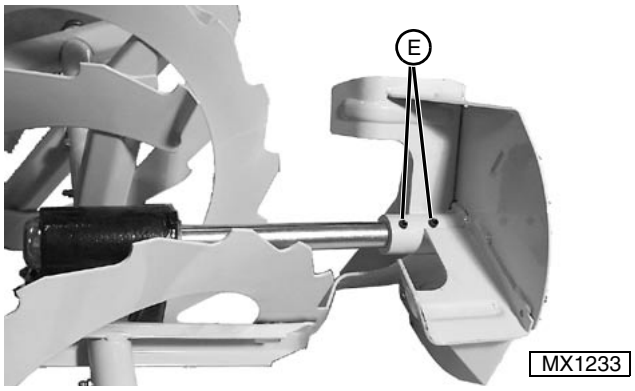
IMPORTANT: Snow will not feed into blower if auger blades are installed on wrong sides of cross shaft.



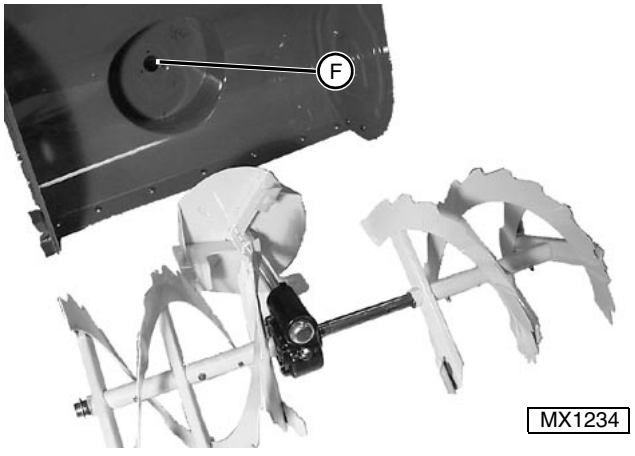
2. Lubricate each cross shaft at grease fittings (A) with multi-purpose grease. Rotate auger to distribute grease on shaft.

IMPORTANT: Use AM122156 Shear Bolt Kit for all models.

3. Install sheer bolt and nut (B), rolled spring pin (C), and outside washer (D).
4. Tighten shear bolts and nuts to **10 N•m (88 lb-in.)**.



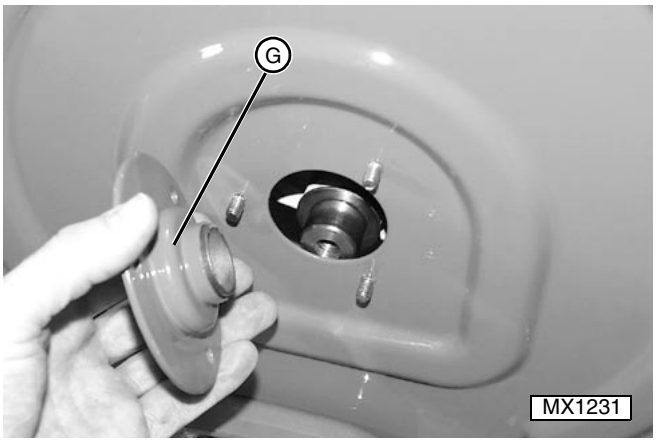
5. If removed, install impeller and fasten with two roll pins (E).



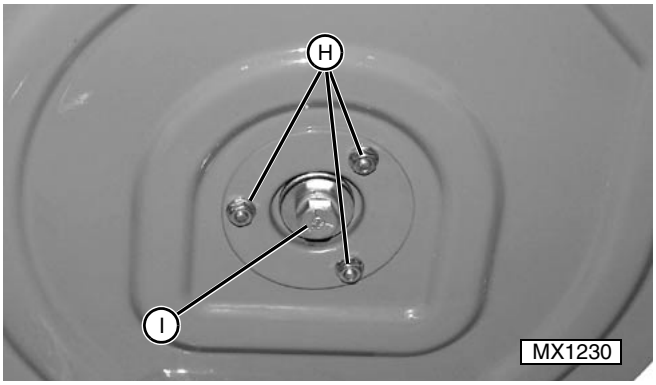
1332DDE Model shown (other models similar)

M

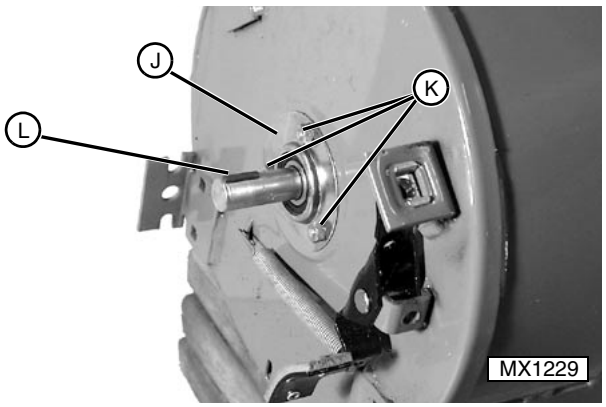
6. Assemble impeller shaft bearing and bearing retainer in housing (F). Do not tighten fasteners at this time. (See “IMPELLER BEARING” on page 27.)
7. Install assembled auger into housing.
8. Apply multi-purpose grease to each end of cross shaft.



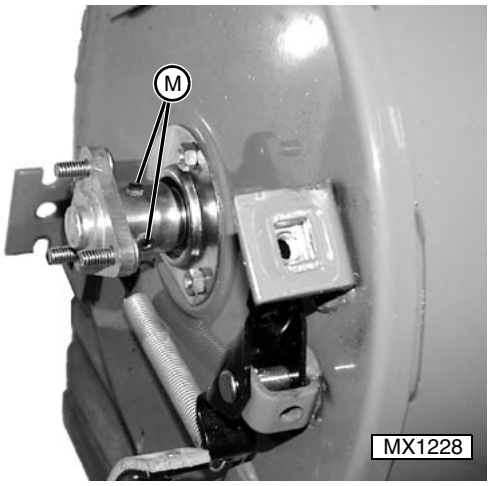
9. Install bushing plate (G) to each end of cross shaft.



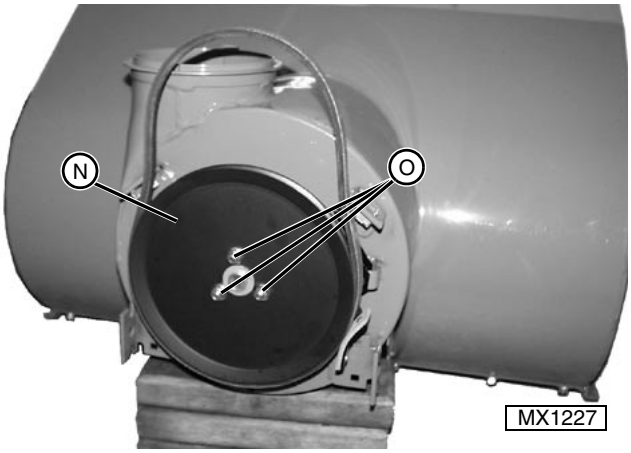
10. Fasten each plate with flange nuts (H) and tighten to **12 N•m (106 lb-in.)**.
11. Install flat washer, lock washer, and cap screw (I) to each end of cross shaft and tighten to **70 N•m (52 lb-ft.)**.



12. Install bearing, bearing retainer (J), and secure with three lock nuts (K). Tighten to **12 N•m (106 lb-in.)**.
13. Place key (L) in keyway of impeller shaft.



14. Install hub on impeller shaft.
15. Apply John Deere Thread Lock and Sealer (Medium Strength) to threads of set screws (M). Tighten set screws.



16. Install sheave (N) on hub. Secure with three lock nuts (O) and tighten to **12 N•m (106 lb-in.)**.
17. Connect blower/auger housing to engine frame assembly. (See appropriate procedures earlier in this section for specific unit being worked on.)
18. Check alignment of auger drive belt and sheaves. (See appropriate procedures earlier in this section for specific unit being worked on.)

M

Numerics

A

B

C

D

E

F

G

H

I

L

M

P

R

S

T

V