TECUMSEH

ENGINES & TRANSMISSIONS

2003 Update

TECUMSEH

FACTORY TRAINING

Welcome to the 2003 Technician's Update Seminar

We are pleased to provide some information about new programs and changes to our Engines and Motion-Drive systems. We are also excited to show you some new and innovative products that we will be rolling out during the 2003 season.

The Tecumseh Education Department is adding more factory school opportunities this coming year. Please take a look at the new school schedule at the back of this publication.

We would like to acknowledge the Tecumseh Master Technicians who have joined us today. At the end of our school sessions, we offer our Tecumseh Master Technician (TMT) Test. The full benefits of being a TMT are only in effect when you are employed by a *Premier Service Dealer*. Your TMT number and Dealer Code number must be in our records for warranty decisions to be accepted by Tecumseh.

We have a questionnaire printed in the book that you will be required to fill out in order to be credited for attending this Update Seminar. We want to hear your opinions and make sure that our Nationwide Education Team is doing their job to the best of their ability. Just a note that there will not be a 2003 Update Video this year, as we have decided to provide more "live" seminars through our Distributor network.

Failure Analysis and Warranty Claims

This years update seminar includes a review of failure analysis and proper warranty filing. The failure analysis section has been added as a result of product returned for evaluation, and found to be customer neglect and/ or abuse, not warranty.

The warranty claim section has been added to help eliminate incorrect or incomplete data. Tecumseh Products Company is proud of our record of timely reimbursement and we appreciate your efforts to help our mutual customers. Now we need your help to get all the data filed properly so we can continue providing reimbursement in the most expedient fashion. If you are not the person filing claims please pass this information on to the responsible party.

As the result of receiving large numbers of claims with incomplete data, effective January 1, 2003, any claims not containing the required data will be returned to your Central Warehouse Distributor for discussion as needed. A letter will be sent to you advising the status of your rejected claim and suggesting you call the distributor to get them the information needed.

Contents

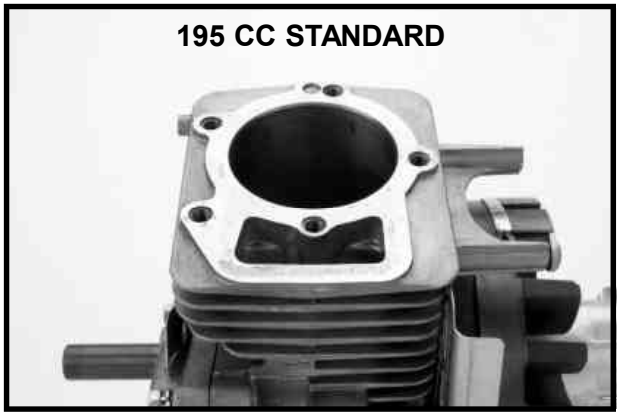
4-Cycle

LEV 90

Our 127cc LEV80 model rotary mower engine is being replaced by a new 50-state Tier II emissions compliant, 148cc, 4 HP LEV90. This engine is ideal for the utility applications market in this horsepower range. The new 148cc engine produces 10% more usable power than competitive engines in this class. This engine also uses an automotive style piston design for cooler operation, reduced oil consumption, longer life, and improved performance.

OHH is standardized

We are standardizing the OHH engine series, eliminating the 172cc offering. Only the 195cc cylinder block will remain as a product offering for applications from 5-7.5 horsepower. This is good news for you the dealer as it standardizes many of the parts for the OHH family.

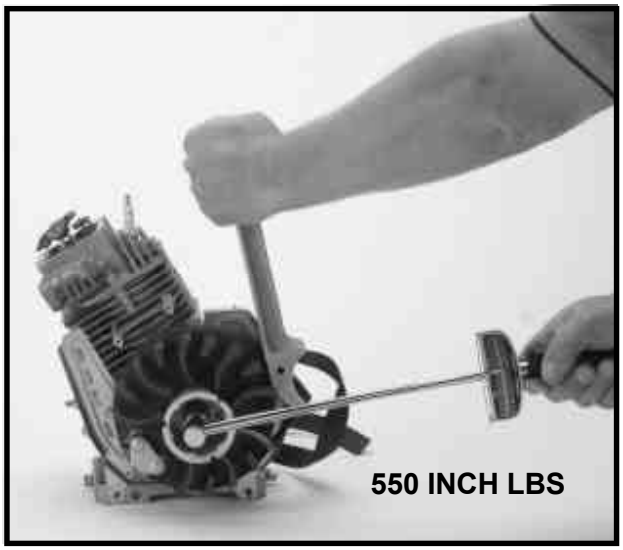


New OHSK 75

Last year we introduced the powered up OHH engine. This engine had a new cylinder head, cast iron camshaft, improved flow valve train, quieter muffler, quick response governor assembly, and high flow carburetor. These improvements are also featured on our new OHSK75 Snow King® engine being introduced this year.

Flywheel Nut Torque Change- OHH/ OHSK

The torque on the flywheel nut for all OHH/OHSK engines has been increased to 550 inch pounds, 46 ft lbs, or 62 Nm. This higher torque value will help prevent possible sheared flywheel keys, on engine repairs where the flywheel nut is slightly under-torqued. The change has been made in our most current 4-Cycle Overhead Valve Engines Technicians Handbook **part # 695244A,** printed in March, 2000. Handbooks printed prior to that date listed the torque spec at 450 in. lbs. If you have an outdated manual please make note of it.

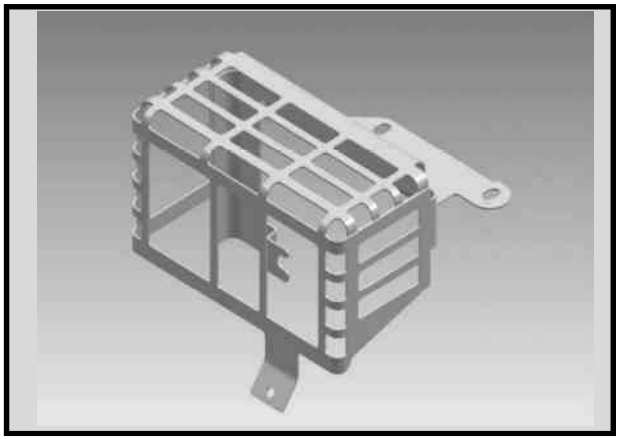


Flywheel Key Change for OHH/OHSK

We have changed the material in the 610961 flywheel key from zinc to a powdered metal. This change helps standardize the materials used for the various flywheel keys. The powdered metal will also provide more strength to help prevent shearing.

New Muffler Guard for HM Series

HM 80 -100 utility engines will incorporate a new muffler guard starting this year. This new muffler guard is designed to fit applications that utilize our Climate Guard® system introduced last year.



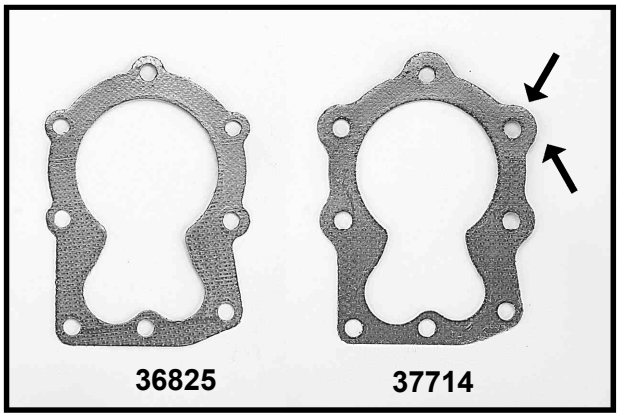
4-Cycle

LEV 105 Utility Engine

The new LEV105 engine is designed to meet the harsh demands of utility applications, and still comply with the stringent emissions requirements. This is a fixed speed, high RPM version of the LEV engine highlighted in the 2002 Update Book. A cast iron flywheel, high performance piston, and a Series I carburetor with choke are a few of the new features added to make this an all season utility engine This engine is intended for use on other-than rotary mower and generator applications.

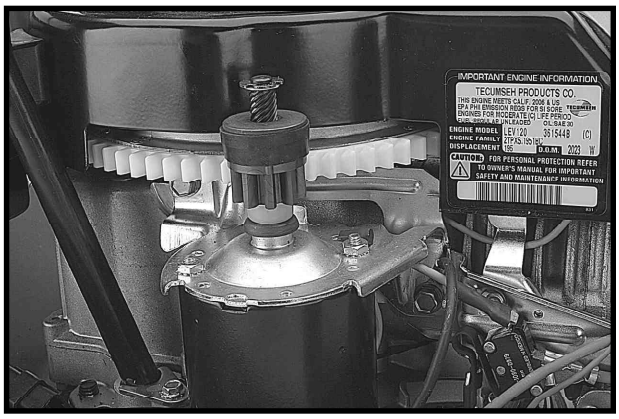
New Head Gasket for LEV90 and LEV105

The head bolt bosses on the LEV90 and LEV105 have been beefed up to help maintain gasket clamping force. Always use the engine model number when ordering the head gasket. This will help ensure you receive the correct gasket should there be a difference from the original LEV model gasket. The old gasket is **part # 36825** and new gasket **is part # 37714.**



LEV 120 Quiet Start

Our electric start LEV engine is now four times quieter than previous models. This was a global project using technology developed at our European product development and manufacturing facility. We combined a proven composite flywheel ring gear with a composite pinion gear to reduce the sound reading by 12 decibels. This is a significant reduction in comparison to other competitors' product.



4-Cycle

OHV Oil Filter Adapter

We are introducing a new oil filter adapter to fit our 13.5 - 18 HP OHV engines. This adapter will compensate for the occasional clearance problem that occurs when replacing a competitor's engine on some applications. The **part #37744** was originally designed for use on commercial out-front mowers. It raises the oil filter, slightly above the mounting surface and draws it in to prevent problems with the tight clearances. This means less modification when upgrading the equipment with our engine.

LEV LEAP Piston Change

LEV 120 engines, built with "LEAP" (Low Emissions, Advanced Performance) technology plated pistons, have been slightly changed since the first LEAP engines introduced last year. The pistons were manufactured with an arrow stamped into the top of the piston pointing toward the flywheel. This has been changed. To stay consistent with all other Tecumseh single cylinder engines, the LEV pistons now have the arrow pointing toward the valves. LEV pistons have offset piston pins, so proper installation is critical, as these pistons are directional.

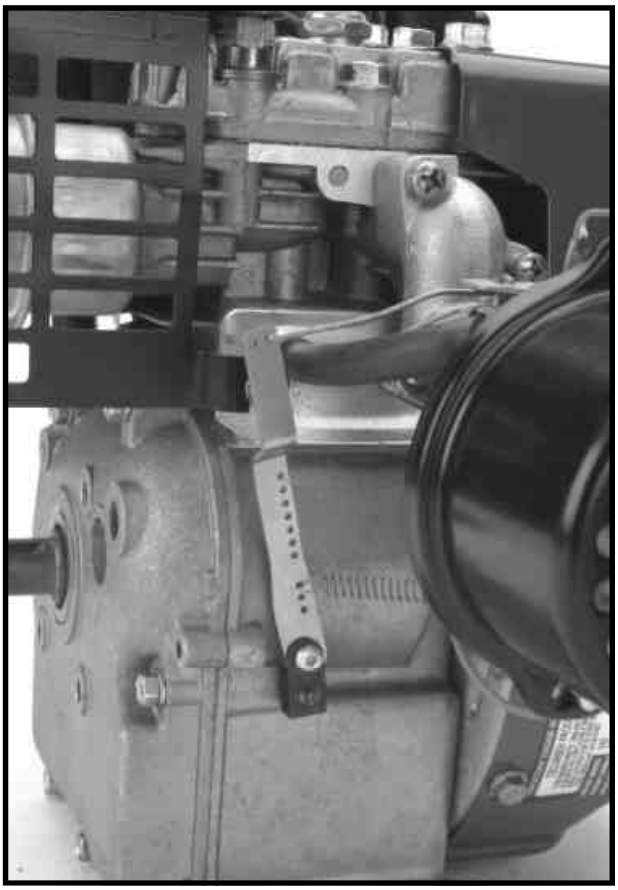
On the piston with the arrow stamped on the top, there will be a cast in arrow on the inside of the piston skirt. These inside arrows must face towards the valves.

Offset Piston on LEV105

The **37720** piston used on the LEV105 engine has an offset wrist pin. This makes installation of the piston directional. The arrow on the piston must face towards the valves. When connecting the rod and piston, attach the rod so that when placing it into the cylinder bore the match marks on the connecting rod face towards the technician. The offset piston helps reduce the amount of piston slap.

H30-40, HSSK50 New Link and Lever

There is a new link and lever assembly, **part # 37735,** to replace the obsolete governor link **part # 31858 and lever part # 31510**. This is a running change, so continue to order the original part numbers until the supersession occurs. When replacing this assembly on an HSSK 50 (Snow King) engine, the original link must be used with the new lever contained in this kit. Instruction sheet 696496 contained in the kit includes illustrations showing the location hole for the link on each model. As always, please set the static governor setting on the engine and check all speeds after installation with a tachometer.



Tech Tip - Static Governor Adjustments

The purpose of making a static governor adjustment is to remove all free-play between the governor spool and the governor arm. Any free-play here will result in hunting/surging or erratic running. After completing this procedure, always re-check the engine speeds.

To set the static governor, do the following:

1. Be sure the engine is stopped or damage may occur.
2. If equipped with a throttle control, place the throttle in the high-speed position.
3. Loosen the governor clamp or screw.
4. Hold the governor arm and link in the W.O.T. (wide open throttle) position, then rotate the shaft or shaft/clip assembly in the same direction and tighten the screw.

4-Cycle

Winter Synthetic is Here

Over the past few years synthetic oil has become a popular alternative for dealers and customers alike. We have researched and developed a pure Synthetic 0W30 Winter Oil just in time for your Fall snowthrower tune up specials. A 32 ounce bottle of synthetic oil can be ordered under **part # 730263**. This synthetic oil has been specially formulated to meet the rigorous requirements of air-cooled engines. The first benefit your customers will notice is easier starting in cold weather as compared to standard oil; up to 50% reduction in pull force over the 5W30 at 0 degrees. When using our 0W30 Synthetic Blend Oil, break-in oil is not needed, so you can use synthetic oil right from the start. The normal oil change schedule recommended in our Operator's Manuals still holds true.

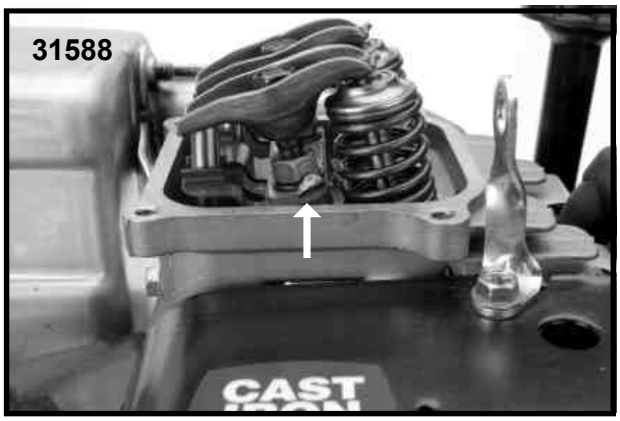
730263

Winter Tune Up Kit

Our new synthetic oil is available in two of our convenient Snow Maintenance Kits. The kits includes a 32 ounce bottle of 0W30 Synthetic Oil, a spark plug, a replacement safety key, and 3 packs of Ultra-Fresh™ gasoline stabilizer to treat up to 7.5 US gallons of gasoline. The kit can be ordered under **part # 730295** for L-head series engines and **part # 730296** for OHV series engines. This makes four winter tune up kits available, including the kits introduced last year with standard 5W30 oil, **part # 730281** (L-Head) and **730286** (OHSK).

Overhead Valve Locking Plate

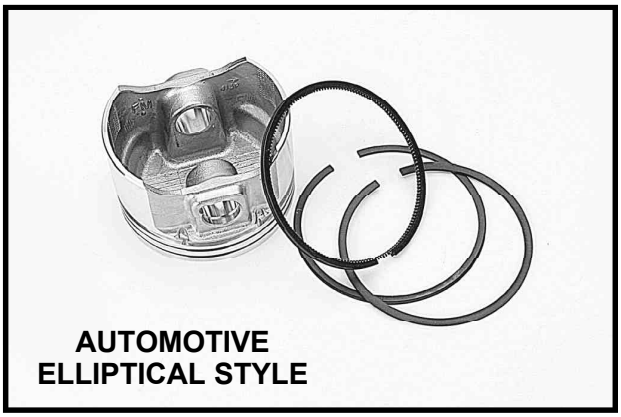
A locking plate has been added to the overhead valve medium frame engine. This plate is designed to have the tabs bent up when the valve clearances have been set. This will prevent the possibility of the locking nut loosening and allowing the valve clearances to change. The part number for the plate is **31588**. This will retrofit where needed.



4-Cycle

OHM Automotive Style Pistons

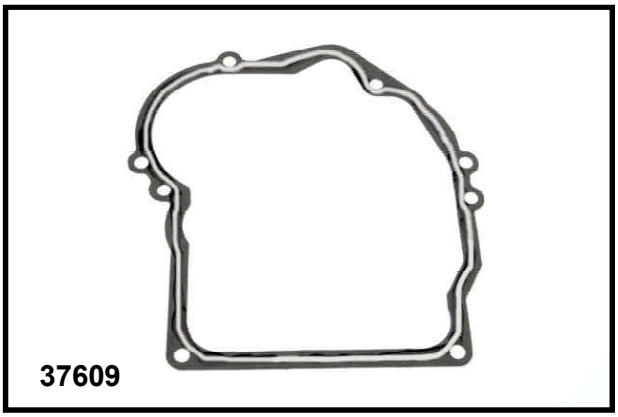
We have made an improvement to our medium frame utility engines by using a piston similar to the automotive style piston featured in our LEV engines. These pistons are elliptical in shape until they reach operating temperature when they conform to fit the shape of the cylinder bore. These pistons and special rings provide improved ring seal, allowing the engine to run cooler, because of less blow-by past the rings on the power stoke. These engines exhibit significantly less oil consumption, which translates to cleaner running and longer life engines for the consumer. This piston also provides more usable horsepower to the engine's performance to serve more applications.



AUTOMOTIVE ELLIPTICAL STYLE

LEV120 Utility Engine Gasket Change

The 37130 mounting flange gasket used on the LEV120 utility engine is being superseded. The new gasket **part # 37609**, has a bead of silicon sealant added, similar to the one used on the HM series engines. The 37609 gasket is also used on LEV, OVRM, and TVS engines.



37609

Obsolete Pulley Fix

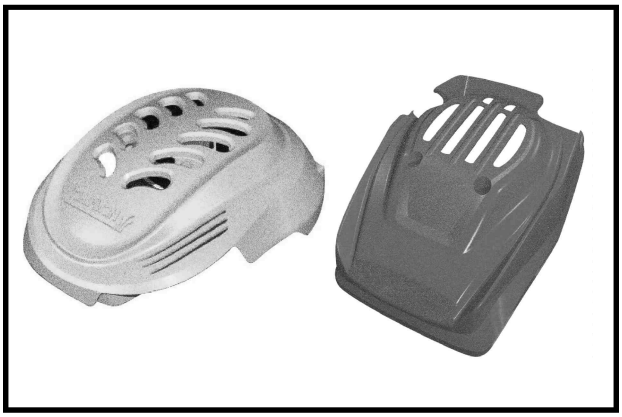
The 590486 pulley was used on many cast aluminum starters produced for medium frame engines in the 1970's and 80's. The pulley is no longer being made by our supplier. Therefore, the old starter can be replaced by using a **590689B** starter which includes a starter cup to facilitate the replacement. Some of the starters that use this pulley are the following numbers; 590479, 590573, 590593 and 590606.

590689B

4-Cycle

MTD/Tecumseh Shroud

Some engines that are being built for MTD will be using a shroud designed and manufactured by MTD. In the unlikely event of a needed replacement or repair part, they can be ordered from MTD. The parts list will include a note stating the shroud is available through the OEM.

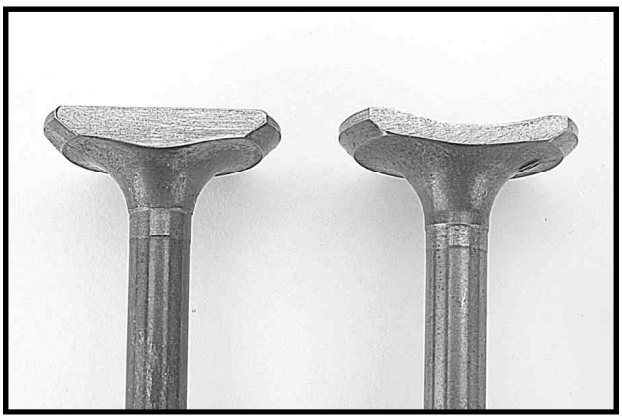


SR3 Shroud

The introduction of the SR3 shroud will be specifically for general purpose applications. This durable lightweight shroud provides increased cooling capabilities, a built in muffler shield, noise reduction features, and an integral debris guard to reduce build up on the speed control bracket. All of this in a stylish but functional package.

New Intake Valve on OHH/OHSK/ OVRM

A new lighter weight, reduced mass intake valve has been designed to combat retainer damage seen on a limited amount of constant high speed applications such as generators and pumps. This damage typically occurs during the first hour of operation. The replacement part 37711 is an assembly that includes the valve, cap, stem seal and instruction sheet. Always remember to inspect valve seat surfaces and repair if necessary.



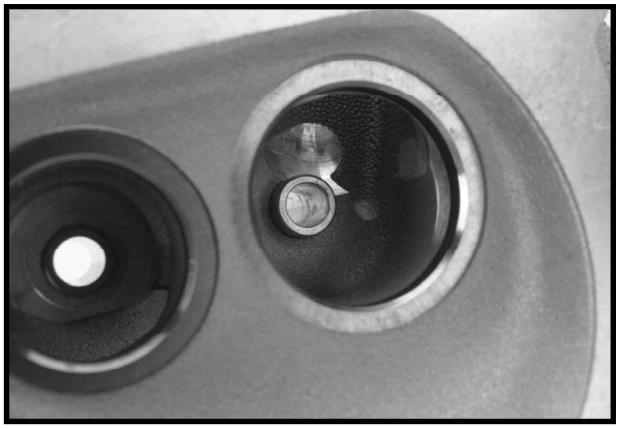
TVT691 AC Cover

The TVT 691 Air Cleaner has been redesigned to be more service friendly. Some tractors have very tight confined spaces under the hood compartment. This new cover is designed to lift upward when removed and can be easily serviced by loosening the two winged screws that are captured in the cover. This is not a retro-fit to older engines. It will be available as a standard feature on all TVT engines built after 10-1-02.

NEW OHV180

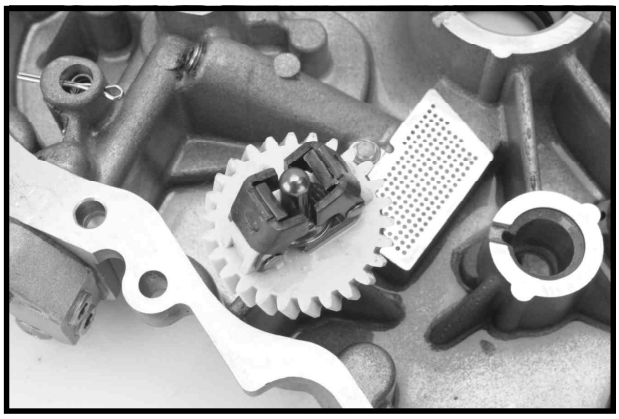
OHV Cylinder Head Porting

The intake and exhaust areas of the new head have been machined to increase flow. The benefit has been seen not only in increased horsepower but also in better performance in all operations and load ranges. This has enhanced an already great engine.



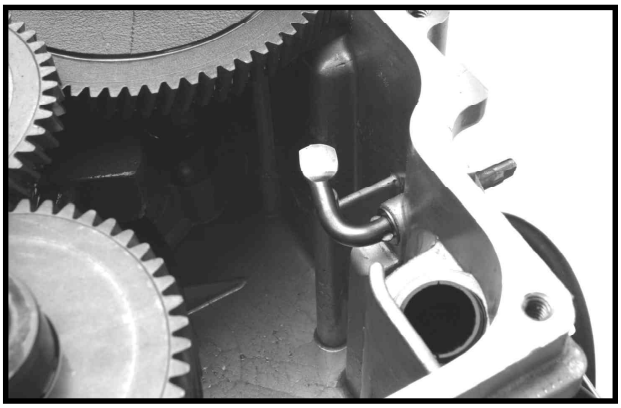
Governor Flyweight and Spring

The OHV 490cc engine will have a new high performance governor assembly that features heavier flyweights and a heavier governor spring. These flyweights provide a smooth run performance to help maintain a steady RPM level in various load, and no-load situations. The heavier governor spring helps to balance the response between the throttle and governor.



Governor Follower Arm

The governor follower arm diameter has been increased to 1/4" for greater stability, strength and balance. The governor lever was changed, and is now a single piece design for ease in adjustment, similar to our OHH engine.

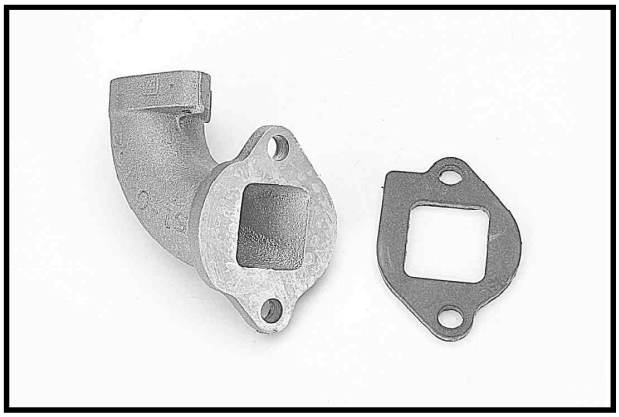


Governor Shaft Seal

An oil seal has been added to the governor arm to prevent oil weeping which may occur from overfilling. The oil could attract dust and create wear.

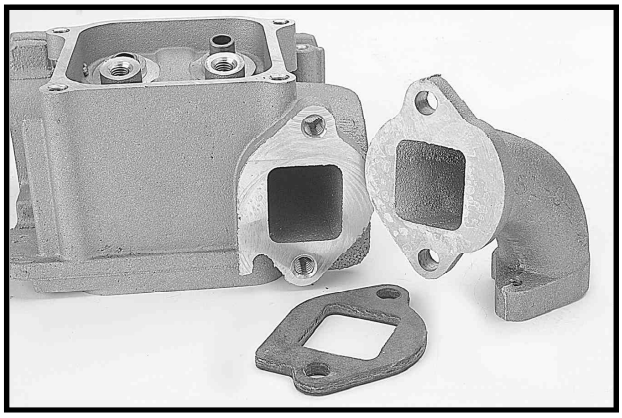
High Flow Intake

A dramatic change in the design of the intake pipe has been implemented to improve flow to the head, which improves engine performance.



Matched Ports

The matched ports on the intake pipe and head reduces any restriction in flow into the valve area and combustion chamber. This also increases horsepower and balances performance.

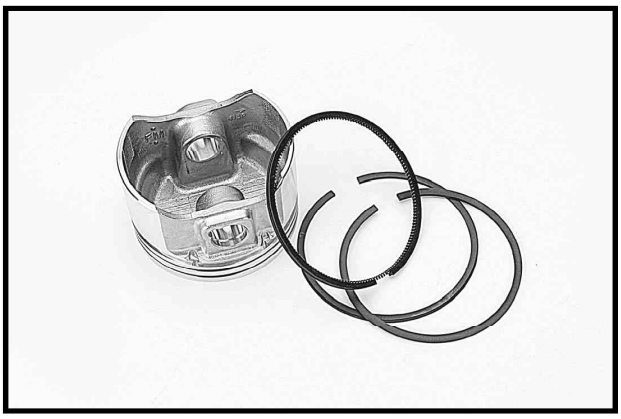


VTX 691

Introducing Our New VTX

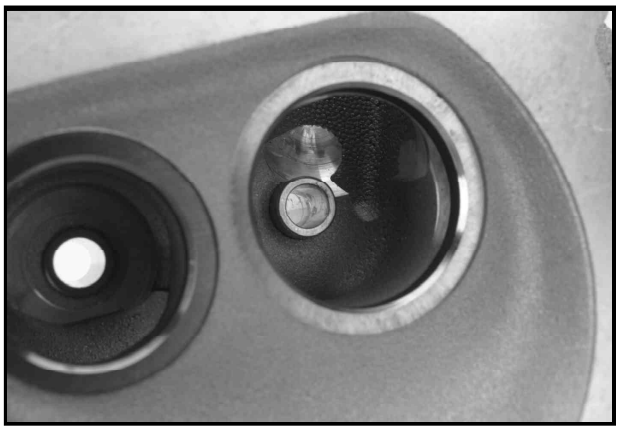
Our twin cylinder engine is now available in a higher horsepower model. The new VTX691 offers unique features for OEM's looking for something a little more than the standard twin. The engine combines a sleek look with new components to enhance its performance. New features of the VTX include:

- Elliptical shaped piston conforms to the cylinder for improved power and minimal oil consumption



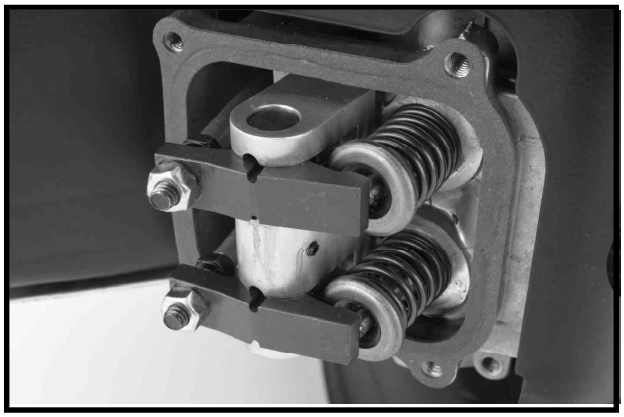
- New "lift up" style air cleaner providing better serviceability

- New cylinder head for improved flow, cooler operation, increased power



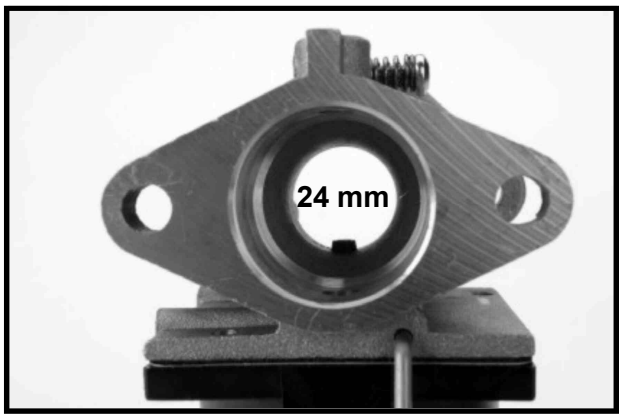
VTX 691

- New powered metal rocker arms for increased durability and integrity



- New composite rocker arm cover to help keep the valve area cooler and quieter

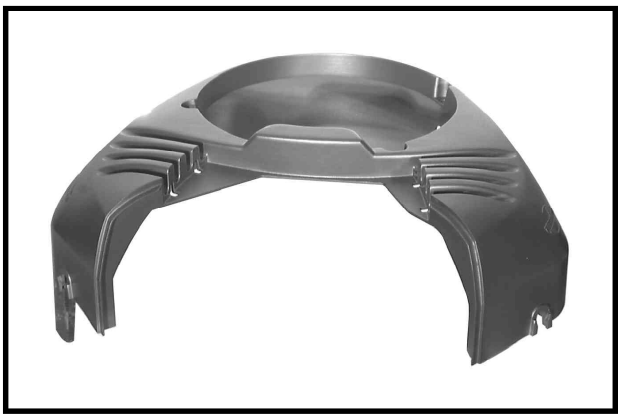
- Carburetor with 24 mm venturi to provide smoother running and easy starting



VTX 691

- Composite camshaft for quieter running

- New decorative shroud with unique styling



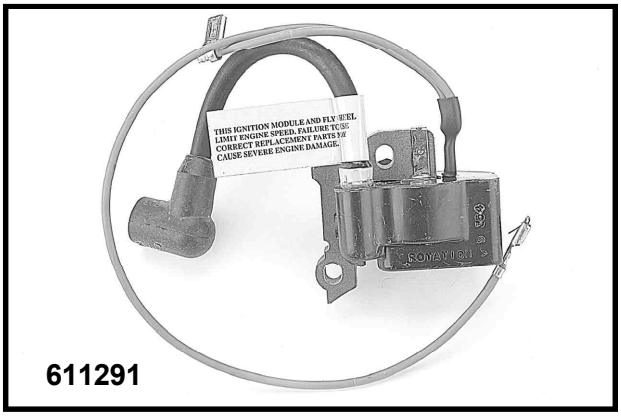
2-Cycle

Winter TC Fuel Cap Change

The chrome adjustable vent fuel cap is being changed to a black nylon automatic seal cap for TC300 Winter engines. TC300 engines for cold weather use will be built with this new cap starting January 1, 2003. This new fuel cap may only be used on TC300 engines.

TC300 Speed Limiting Ignition

The TC 300 has had an interesting history over the many years it has served as the industry's little workhorse. The more recent applications for the TC300 is mini carts. This application introduced a new speed limiting ignition module that requires a special gap setting between the flywheel magnet and the lamination stack. The air gap should be set as close to .004 as possible to ensure its RPM limiting capabilities. There is a special decal on the plug wire to identify this ignition. The part number is **611291**. The maximum RPM should not exceed 6,500.



611291

Synthetic Blend 2-Cycle Oil

Now you can help your customers protect their investments on their 2-cycle power equipment. Our new 2-cycle synthetic blend oil provides superior protection for any application. Tests have shown engines running for a significant number of hours on this oil with very little carbon build up. The oil also comes with a fuel stabilizer mixed in to ensure startability even when the equipment may sit between seasons. Order some today to get ready for the snow season, **part # 730227C**

New AV Reed Plate

A new reed plate has been designed to help improve the overall performance of the AV520 engines. This new part has some changes made to the "windows" around the reed port openings. The reed seals against these windows during the power stroke. The old style plate had a raised surface around each window. They now have a continuous surface around the windows which creates an improved seal with the reed. The real benefit to the customer is improved performance. The part number supersedes to 470153B.

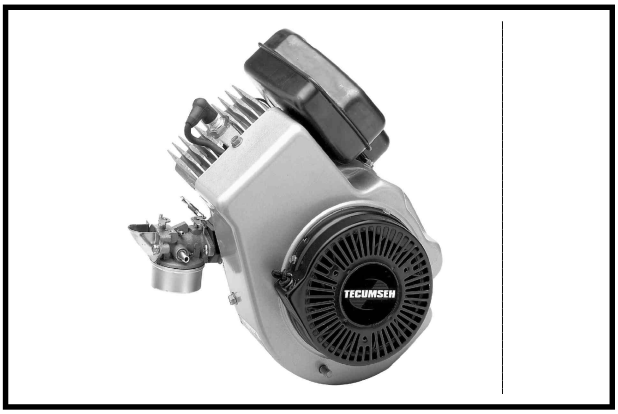
2-Cycle

New AV Fuel Cap

The metal fuel cap for the AV model engine has been changed to include a more durable nylon coating. This new serrated design gives the operator better grip when opening the cap. The cap has a fully retained gasket that always stays in place and cannot separate from the cap. The **part # is 410285.**

HSK 870 new offering

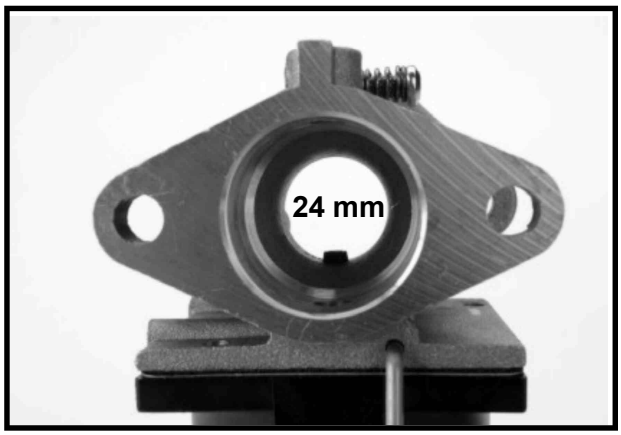
The 2 cycle snow line has added another significant power horse. The HSK 870 will be introduced this year. This 7hp engine builds on an excellent tradition of 2 cycle snow product, that has a reputation for durability and power. With standard features like the most responsive mechanical governor in the 2 cycle market, ball bearings on flywheel and PTO ends, one piece connecting rod and a cylinder head that is integral to the cylinder.



Carburetion

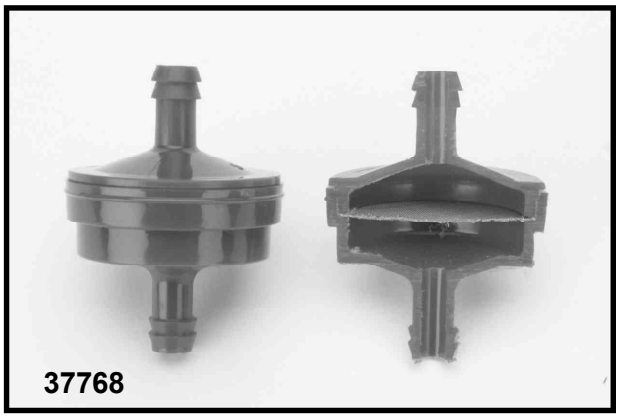
Series 7 Carburetor

The series 7 carburetor used on the OHV 490cc model engine has been improved. The venturi has been changed to a 24mm opening. This has helped improve starting and increase horsepower. It also improved emissions on what was already the lowest emission engine in our lineup.



New Fuel Filter

Tecumseh is introducing a new fuel filter this year, **part # 37768,** as a companion to the current paper pleated filter **34279B** we offer today. This will give you two options when replacement becomes necessary. This filter can replace the current filter but will require some modification to the fuel line to accommodate the 1/2" decrease in size. This filter utilizes a 100 x 100 micron stainless steel mesh screen. It also has a distinctive red color. This new filter is designed to provide better fuel flow on engines not equipped with fuel pumps.



Emissions High Altitude Jet Chart

The high altitude Bulletin has been updated to include emissions carburetors. This bulletin lists a reference number stamped onto the bowl nut. It then cross-references that to a reference and service number. The new bowl nut compensates for equipment that runs 6,000 to 11,000 feet above sea level.

HIGH ALTITUDE JET

FOR EMISSIONIZED CARBURETORS

The following list of altitude compensation jets is being provided for use with emission grade carburetors at elevations between 6,000 and 11,000 feet (1,824 - 3,344 meters).

This list applies only to engines which are identified as compliant with CARB (California Air Resource Board) or EPA US Environmental Protection Agency) regulations.

To determine the proper jet for your carburetor, simply locate the number stamped into the original bowl nut. Then use the chart below to identify and install the proper jet.

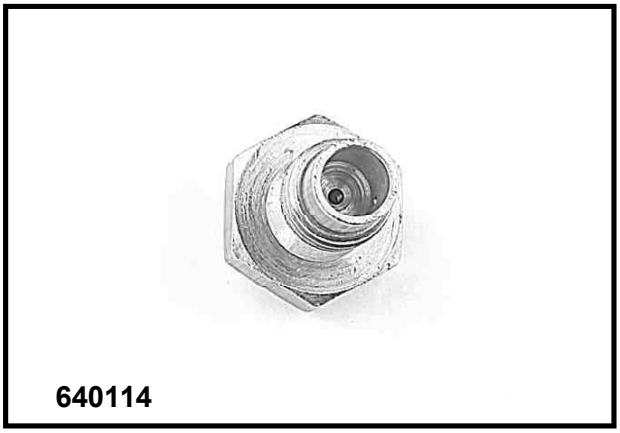
NOTE: Installation of altitude compensation jets is NOT WARRANTY

Carburetion

HM High Speed Jet Change

The Horizontal Medium Frame (HM) carburetors that are listed below now have a larger main jet orifice to maintain smooth running in all climates and temperatures. Colder temperatures can sometimes cause the carburetor to surge when the engine is running under a no load condition. While the engine will perform flawlessly under load, the surging can give the perception of a running problem. This change will correct that potential situation on the HM80 -100 series of engines. The old bowl nut **part # 640137,** has been replaced across the board to the **640114.** The list below of HM Series Carburetors will reflect this change.

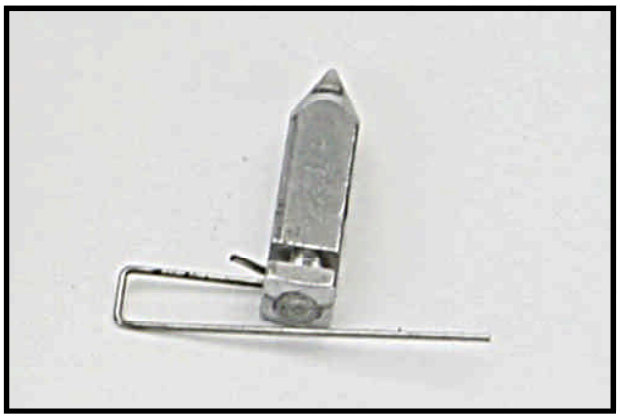
640064	640154
640112	640152A
640152	640269
640125	640260A
640129	640268
640153	640277



640114

New Inlet Needle

We have changed the inlet needle used on all Tecumseh built float style carburetors by increasing the angle on the taper of the needle. This insures the release of the needle from the seat even after long periods of storage. The tight seal condition was found to sometimes cause the needle to stick closed, not allowing fuel to enter the bowl. This was a running change in mid 2002.



Carburetor Book Revised

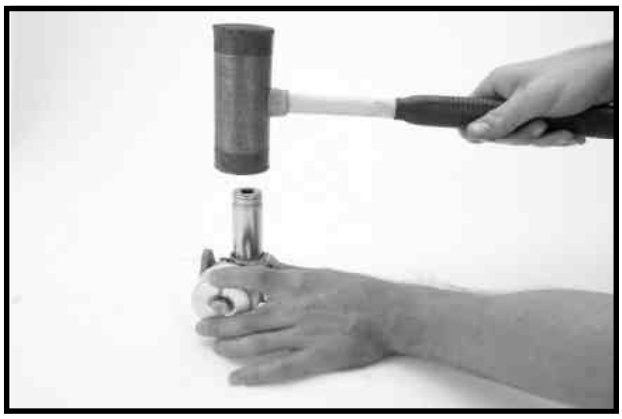
The carburetor book **# 695907** has been rewritten to include some new shop tips. It also has a pictorial review on cleaning and servicing emissions carburetors. The use of the 670377-carburetor tool is also detailed in the book. Get yours today!

Carburetion

Primer Bulb Removal and Installation Tips

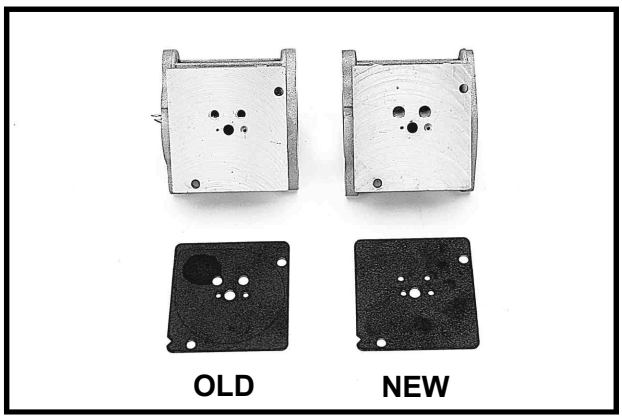
Using the right tool to remove a primer bulb is important. Some tools may gouge the body of the carburetor, causing irreparable damage. A small flat head pocket screwdriver is an ideal tool to quickly and cleanly remove an old primer bulb. Just slide the end under the lip of the bulb and pry the retaining ring out.

When installing a new primer bulb on a carburetor it is important to install it flush to ensure a proper seal. A 12 point, 3/4" thin wall, deep well socket makes an excellent installation tool. To make sure you have the correct style socket, place it in the primer bulb cavity to make sure there is enough clearance and that the socket bottoms out. Once the new primer bulb and retaining ring are placed inside the cavity on the side of the carburetor, place the socket over the primer and give a firm tap with a rubber mallet.



Carburetor Improvement - OHM

Certain equipment applications can really shake up an engine. Running a go-kart over rough ground can cause the fuel to slosh around in a float carburetor. The fuel can splash up into the bowl vent under these conditions and fill up the vent passage. The fuel then gets sucked into the venturi causing a rich condition. We have increased the bowl vent passage on our OHM carburetors to prevent the passage from overfilling with fuel. This improvement eliminates rough running over rugged terrain. Note the smaller holes in the gasket for the new carburetor.

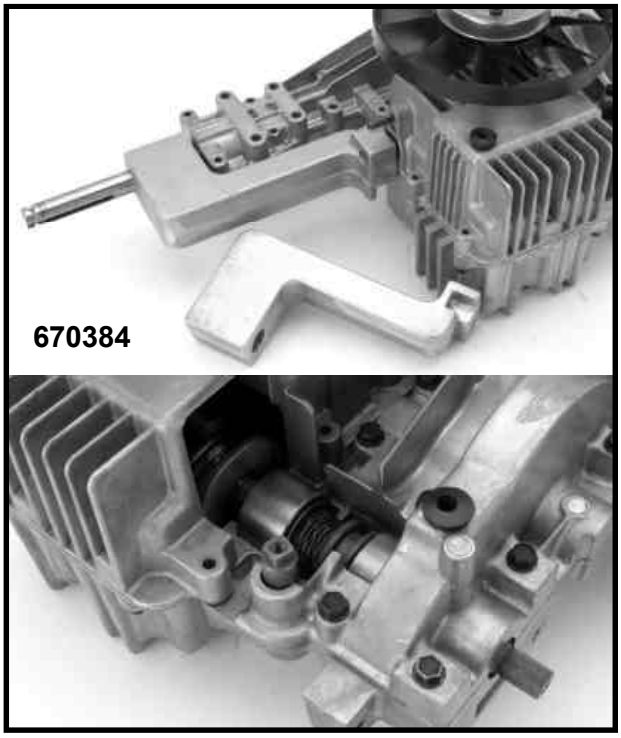


New Tools

LTH Alignment Tool

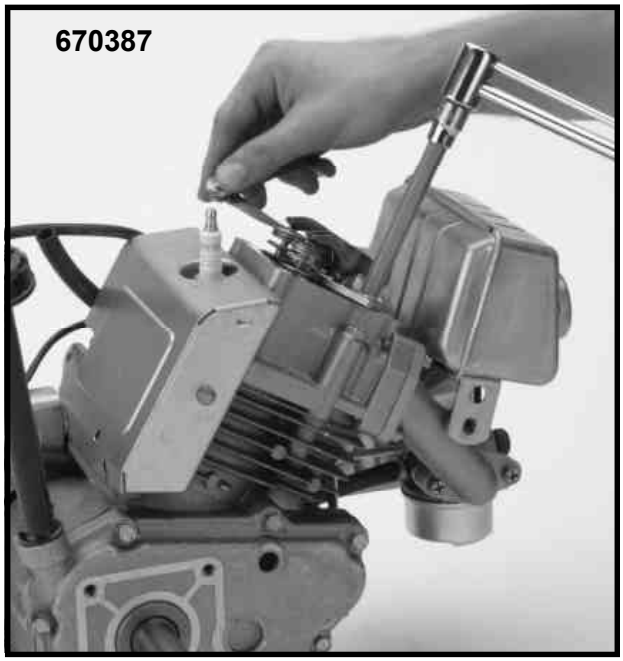
By now, many of you may have come across our LTH Hydrostatic Transaxle. This hydrostatic transaxle is a more service-friendly unit, compared to our previous model hydro. The hydrostatic pump may be replaced if necessary, or the differential may be taken apart and repaired. It is important to remember that if either one of these repairs are performed, the LTH alignment tool, **part # 670384,** must be used when the transaxle is reassembled. Your Authorized Tecumseh Distributor will verify that you own the alignment tool any time a replacement pump is ordered. This required tool will properly line up the external shaft of the pump with its mating internal shaft on the differential, preventing any premature wear in the neutral disconnect area.

The tool slides over the axle and the control shaft. Then, the three bolts connecting the two units are tightened to 90 inch lbs. (10 Nm).



Valve Lash Tool - OHH/OVRM

This new 12 point, crows foot valve lash tool will make valve adjustments even easier. This tool eliminates the need to remove the fuel tank on the OHH engine, and assists the technician when there is not enough clearance to fit a wrench or a normal width crows foot. The 12 point feature of the valve lash tool will give the Technician 6 options with the radius of the 7/16 jam nut. The Tecumseh **part # is 670387.**



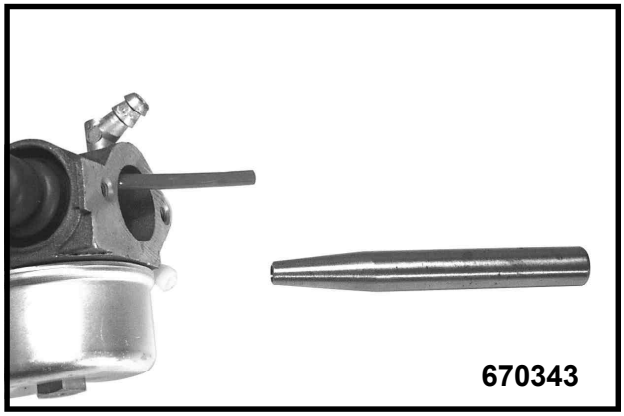
New Tools

Pocket Protectors for all

These white plastic pocket protectors went over big with the dealers that visited our booth this past summer at the Louisville EXPO. Order some today for your shop, **part # 696501.**

Vent Tube Installer

This tool has been often over looked as a vital part of carburetor rebuilding. We are reintroducing it because of the need for precise installation of the vent tube on emission carburetors. This vent tube extends out into the air filter area to use an air source that is more stable or consistent. Not pressing it in to the proper depth could affect the way the engine performs on certain applications as well as its ability to be retained. The part number is **670343**.



670262A Seal Protector for Engines and Transaxles

This seal protector has been available for many years. Last year it was given an additional work load. It has been redesigned to be used on the LTH and MST transaxles and standard point ignition engines with .750" crankshafts. Because the transaxles have seals on these oil filled units, it is necessary to protect them from any damage during assembly.

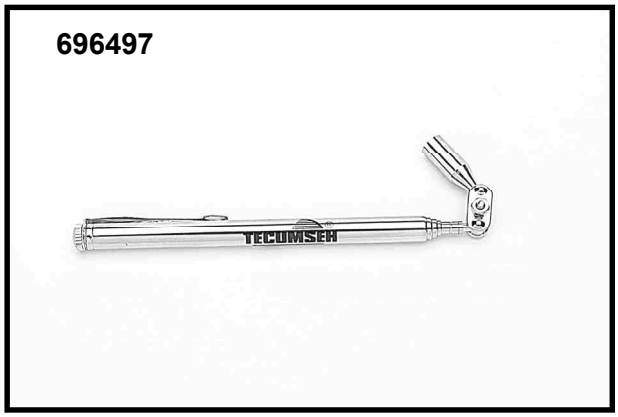
Load Tester 670386

This tester gives the technician a tool capable of performing operations designed specifically for engine voltages produced in our industry. Some of the functions include: a battery load test, evaluating the batteries ability to crank the engine; a charging voltage test that measures alternator/ regulator voltage output; and a starter motor test to identify current draw; and more. The part number is **670386.**

New Tools

Mini Magnet!

This versatile chrome telescoping magnet with the bold Tecumseh emblem is an excellent tool to use when working in tight places. The magnet end rotates in all angles and the shaft extends the tool to 18.5" (469.9mm). Order some today, **part # 696497.**



Safety Glasses

Safety glasses are a necessity in our shops today, but are often-time put off to the side because they slide down your nose or get in the way when you're working on something. These new Tecumseh safety glasses have an adjustable draw string to hold them tight to your face, or if you have to move them up for a moment, the elastic draw lets you position them with out falling off your head. The sides adjust for all shapes and sizes, and they have the Tecumseh logo on the side shield. To get your pair order **part # 696503**.

Service and Shop

www.TecumsehStore.com

We now have an on-line website where you can purchase official Tecumseh logo apparel and merchandise.

The site offers caps, jackets, windshirts, fleece/ sweatshirts, polo shirts, long-sleeve shirts, tees, and also features a large selection of women's apparel. The store has polo shirts from as little as $16.00 as well as denims priced in the $25 range, embroidery included. We have good quality merchandise from manufacturers such as Vanheusen, Peregrine Bay, Lee, Ruff Hewn and at the higher price range we offer the Cutter & Buck label.

Merchandise available for dealer imprint includes items priced less than $1.00 and many items ranging in price from $1.00 - $10.00. Any of this merchandise would be a great giveaway item. We have 3 different styles of key chains, pens, mugs, bag chairs, knives, hunting caps-both camouflage and blaze orange, expandable briefcase, golf balls, etc.

New apparel and merchandise will be added periodically so check the site often.

Orders may be placed on the website with a credit card, toll free at 1-800-770-4030, or by fax at 414-352-5760.

Miscellaneous

www.TecumsehPower.com

Check out the many features on our website, such as our Factory School Schedule in Grafton, WI and Douglas, GA, our ever expanding dealer locator guide that is updated daily, and a new order inquiry feature. Now technicians from our dealership base, Sears technicians, and all CWD personnel can track parts orders with their purchase order number. This will list the part number, when and how a part was shipped, along with tracking numbers provided UPS or Airborne Express.

tecumsehwarranty.com - SPEED

The warranty web access request form can now be downloaded from your Central Warehouse Distributor's web site in Canada and the U.S. Download and submit to your CWD with original signature to be allowed access to **tecumsehwarranty.com.** Once approved, Tecumseh will send you a password to access the system. Remember to fill out warranty claims accurately, and retain and tag all warranty items until you receive payment from Tecumseh. Failure to complete the claim form completely or correctly will result in a return of the claim electronically.

tecumsehwarranty.com

Power Sport vs Non-Power Sport Engines -- Think Safety !

Fun-karts and mini bikes have become an increasingly popular hobby. Fun-karts purchased new will be equipped with our Power Sport engine. Power Sport engines have recreational vehicle (RV) features designed for this specific application. Tecumseh approves only Power Sport engines for use on go-karts, fun-karts, and mini bikes. Use of any other type of engine could cause serious injury or death. No matter what service was performed, it is the servicing dealer's responsibility to ensure the engine speed is set to the correct RPM specification before the vehicle is returned to the customer. **Also, be sure all equipment guards are in place.**

Miscellaneous

Power Sport Operator's Manual

We now publish an Operator's Manual for all of our Power Sport engines which will be included with engines built starting approximately November 15, 2002. The manual discusses the unique features of these engines as well as safety advisements. If a customer who purchased a new Power Sport engine and did not receive an Operator's Manual contacts you, please contact your Central Warehouse Distributor or our Customer Service Department and a replacement will be provided at no cost. This manual is only for Power Sport engines. Do not request or provide the Power Sport Operator's manual with utility engines. **And most importantly, DO NOT sell or install non-Power Sport engines for RV applications.**


TECUMSEH

POWER SPORT

Engine

Operator's Manual

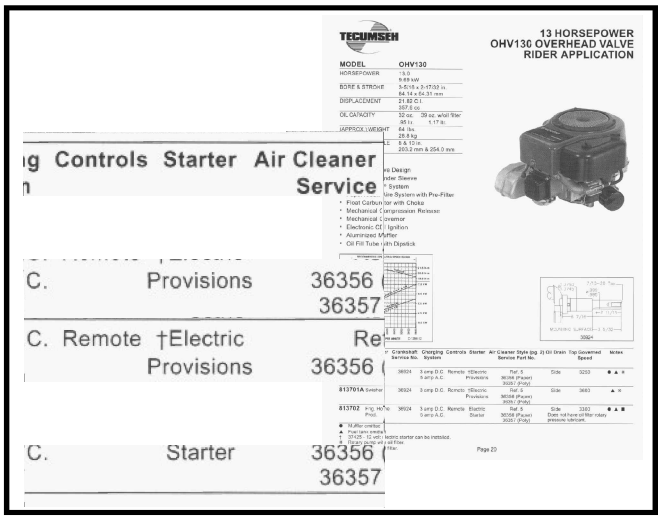
Four-Cycle Engine • Horizontal Crankshaft • Air-Cooled

Table of Contents

181-1269-14
(English) 10/01/02

Service Engines vs O.U.R. (Original User Replacement) Engines

Just a reminder to Technicians that Tecumseh service engines may not come with electric starters, oil filters, fuel shut off solenoids, or other add-on features. The service engine will come *equipped* to add any of the additional features the old engine may have. Since service engines are typically used as direct replacements, it is often a cost savings for the customer to reuse the old parts. Before ordering the replacement service engine, we recommend checking your current "Service Engines and Accessories Book" to verify the options included with the engine. O.U.R. engines are often designed to replace engines other than Tecumseh, and therefore will come with any add-on features that are required, such as electric start.


TECUMSEH

13 HORSEPOWER
OHV130 OVERHEAD VALVE
RIDER APPLICATION

MODEL OHV130

g Controls Starter Air Cleaner
Service

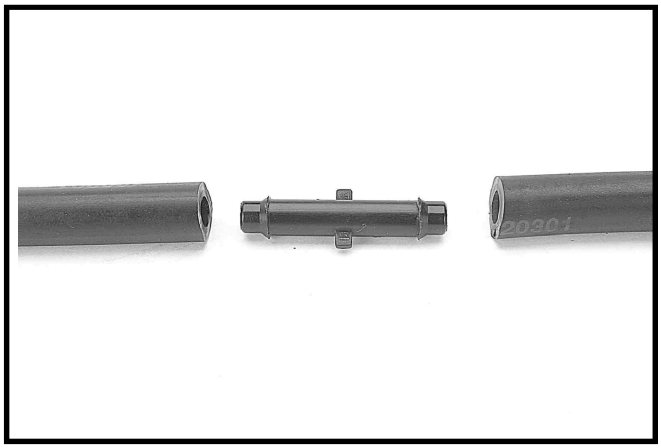
C. Provisions 36356
36357

C. Remote †Electric Re
Provisions 36356

C. Starter 36356
36357

Fuel Line Installation Tip

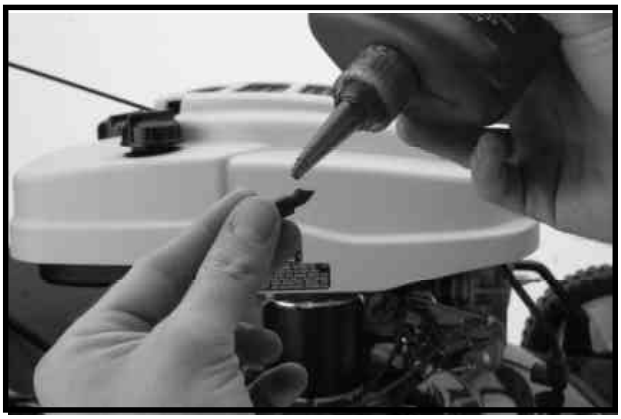
Larry Schneider from Top Cut Mower Parts & Service in Arlington, Texas gave us this suggestion. Larry's technicians connect the old fuel line to the new by using a common 3/16" ID plastic splicer with the bulk fuel line **# 430173.** Now pulling the new line through the attached blower housing is a snap. To further aid this procedure try coating the new line with dish soap before pulling it through. This will also assist you in routing the fuel line in the same path as it was from the factory.



Miscellaneous

Stanley Shrouds

Our OVRM model used on the Stanley walk behind mowers has a special decorative yellow shroud. When reinstalling the shroud to the engine, apply Loctite 271 to each of the three mounting screws to ensure they hold the shroud firmly in place.



O.S.E.M.A. Program Approved

Canada has the Ontario Small Engine Mechanic Apprenticeship Program which is the Canadian equivalent to the O.P.E.E.S.A. program. This was approved by Tecumseh in February 2002 as a certified prerequisite for taking the TMT test. For Quebec, neither O.P.E.E.S.A. or O.S.E.M.A. will be required to take the TMT test until a French version with study materials is made available. Individuals will be qualified based on their fundamental technical knowledge and ability at the discretion of their CPT Service representative.

O.S.E.M.A. Program

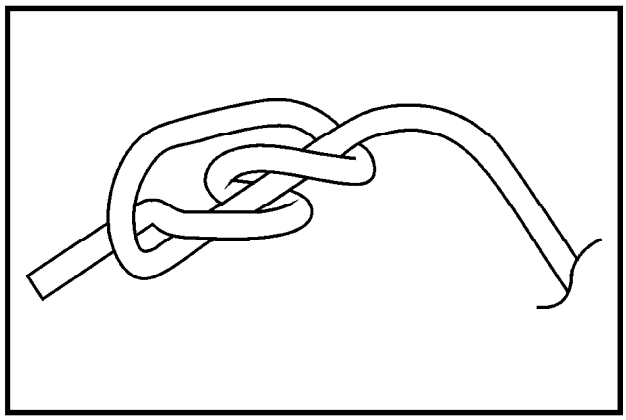
Current Video Status

Dealers call from time to time looking for a video we may have produced in the past that is no longer available. The videos that we still have available today are 695285 (800 series Transaxles), 695148(900 series Transaxles), 696250 (MST Transaxle) and the 696333 (TVT691 Twin). Additional videos or training CD's will be available in the future.

Miscellaneous

Left Handed Knots

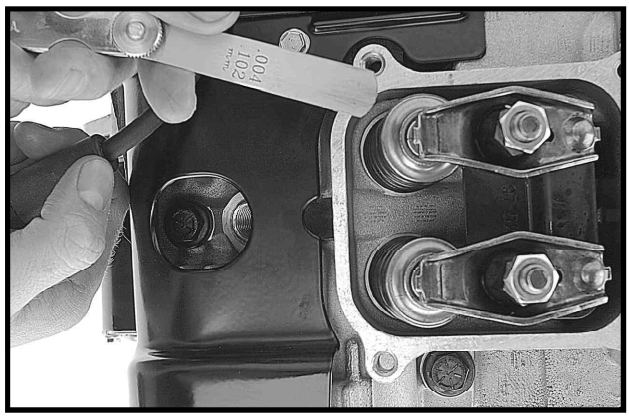
Our recoil starter handles will stay fastened to the rope best when retained by a double left-hand knot.



Starter problems?

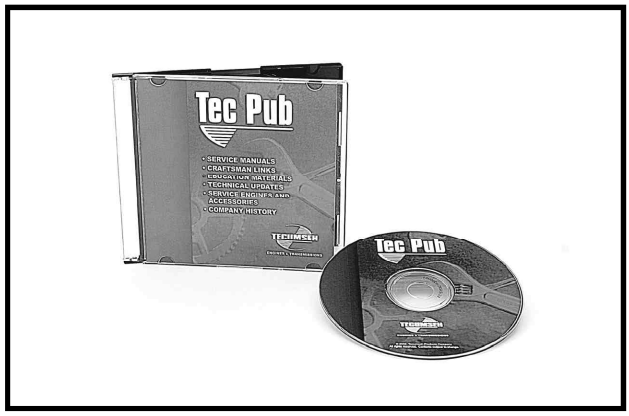
Our Warranty department has discovered that some of our dealers have misdiagnosed the root cause of some failed electric starters. Please check valve lash and the MCR action before releasing an engine back to a customer with a new starter. If valve lash is set too loose, the starter could be overstressed after extended use.

Also a malfunctioning Mechanical Compression Release on a camshaft could be the problem. To check the MCR “action” simply remove the valve cover, and spark plug. With the engine installed on the equipment, rotate the engine clockwise from the flywheel side and watch right at the start of the compression stroke. The MCR should “bump” the exhaust valve slightly. If valve lash is set properly and the MCR is not functioning properly, then a new camshaft is necessary for OHV and OHM Series engines. Remember the OHH and the TVT (Twin) cylinder engines both have serviceable MCR mechanisms.



TecPub Updated!

Our highly anticipated and interactive TECPUB CD is at your Central Warehouse Distributor near you! This power packed CD features all Technicians repair manuals, Service bulletins, our most recent Update books and the History of Tecumseh Products Company in a movie format-just to name a few. Just pop it in your computer and take advantage all the features this CD has to offer. The price is very low at $24.95 US. Order one today, **part # 696130**!



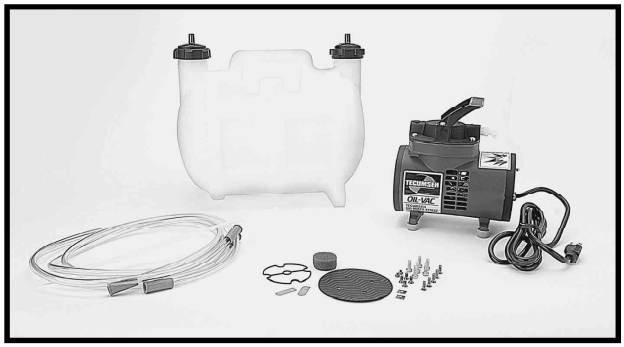
Miscellaneous

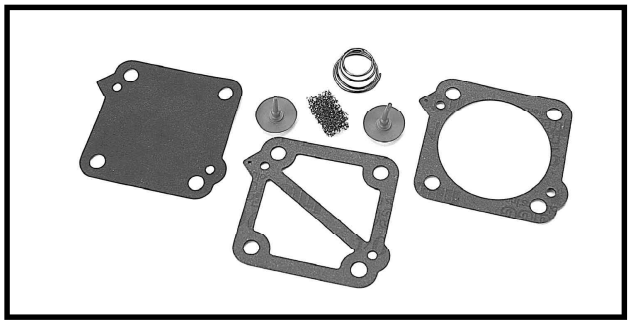
Oil Vac Warranty

The warranty for the Tecumseh oil vac must be filed with the manufacture of the pump, Thomas Industries. Any claims filed with Tecumseh will be returned to the dealer. Thomas Industries can be contacted by calling 1-800-848-7735.

The service kits listed below can be purchased through Tecumseh.

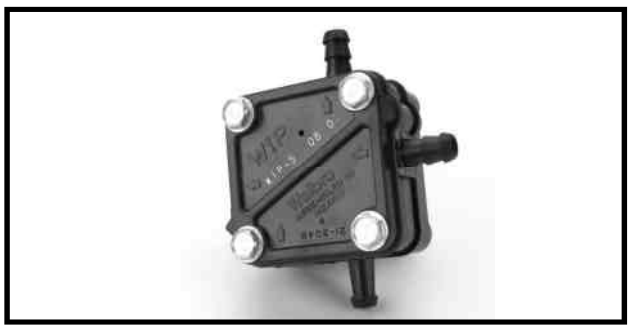
670367	Tank
670383	Vacuum Hose Kit
670380	Pump Repair Kit

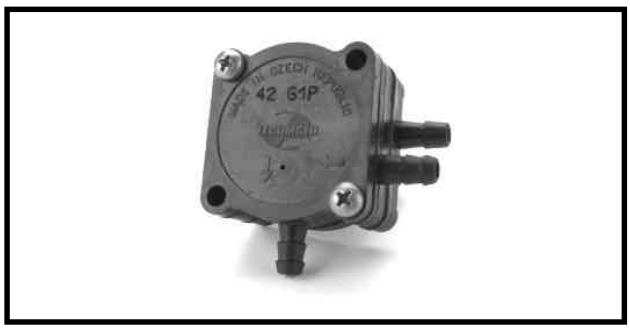




Fuel Pumps

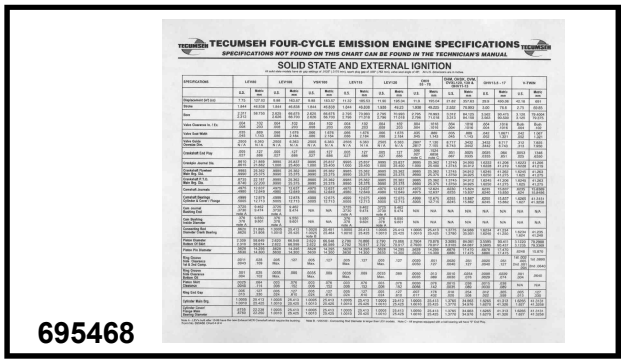
Just a word of caution when repairing the fuel pump on a Tecumseh engine. We will use both Walbro brand fuel pumps as well as our own brand of fuel pump. Our repair kit, **part # 35791**, can only be used on the fuel pumps with the name Walbro embossed on the cover. Currently the Tecumseh fuel pump will not have a repair kit available. Your parts look up will still list the fuel pump repair kit as being usable on all models so be sure to check on the pump itself for identification.





Wall Chart Updated

This wall chart, used in many shops for all critical engine specifications and dimensions, has been updated to include all emission compliant engines, both “L” head and overhead valve. This four chart set will come in handy for both old and new engines and can be hung on the wall for easy access. The part number is **695468.**



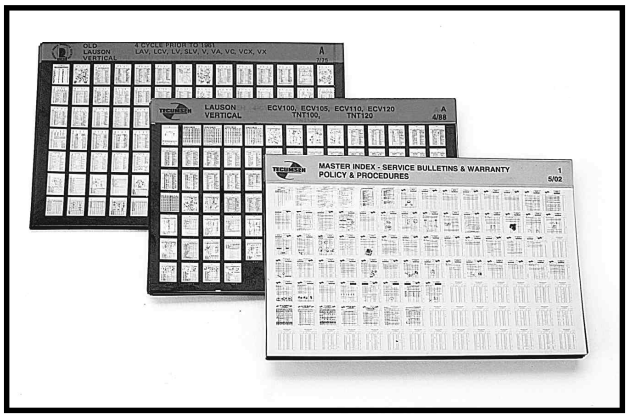
Miscellaneous

3-Year Warranty Code

At times we have offered an exclusive three year limited warranty on some of our products. The three year warranty has been around for several years but sometimes caused confusion for the dealers who were servicing the equipment. Typically, the only way to tell if a unit had the extra year of warranty was by documentation included with the Operator's Manual. If this paperwork was not provided at the time service is requested, the two to three year-old unit may appear to be out of warranty. We have now added the new warranty category "**M**" to eliminate the confusion. On products that carry the 3-Year Drive Train Warranty, a special addendum decal will be added to signify the extended warranty. This decal will be placed alongside the Engine Identification label.

Microfiche

As we no longer need to update certain sections, we have restructured our parts microfiche set. We now have three individual decks which allows the dealer to have a more manageable fiche set to work with. The current active deck **# 693030** is now a 62-card deck that covers the models built from 1990 to current production. This deck covers two- and four-cycle engines and **all** Tecumseh and Peerless Transmission and Drive Product component parts. It will be updated on a continuing basis. The second set, **# 696498**, is a 29-card deck that covers two- and four cycle engines from 1962 through 1990. The third deck **# 693634A** covers Lauson & Power Products engine models prior to 1962. A complete list of all products covered by these sets are listed elsewhere in this book.



TMT Study Guide

We have developed a booklet, the Tecumseh Master Technicians Test Study Guide, to aid in preparing for our TMT test. Selected technical information is covered and some sample test questions are provided. While this booklet will be a great tool to help you get ready for the TMT test, we still recommend reading and fully understanding each of our Technician's Handbooks. The part number for the TMT Study Guide is **696499** and it is available through your normal source of supply.

Miscellaneous

TMT Testing

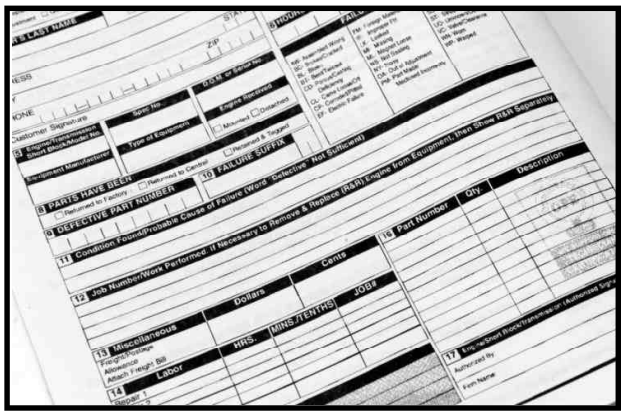
Not everyone can be a TMT. We encourage you to rise to the challenge and become certified. Remember that a TMT employed by a Premier Dealer has the authority to make their own Tecumseh warranty decisions. Also, remember that the TMT status belongs to the technician, not the dealership.

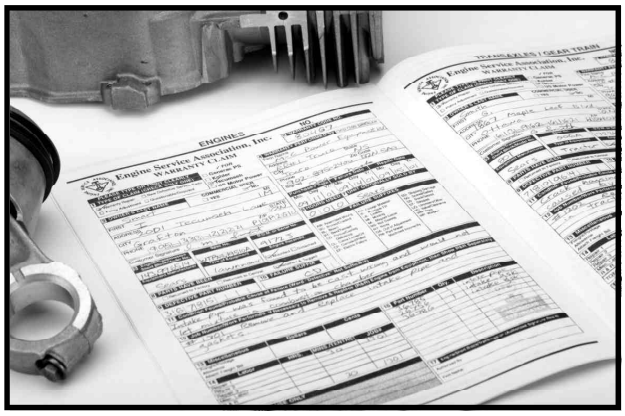
The prerequisite for taking the TMT test is the OPEESA 4-Cycle test. You will need to provide a copy of your certificate on your exam day. Upon receiving a passing grade (currently 75%), the newly inducted TMT receives 3 embroidered TMT Patches, a framed Certificate, a Black and Red Baseball Cap and a high quality engraved TMT Plaque to hang on the dealership wall.

Tecumseh's Service Division is shipping increasingly more copies of the TMT Test **part # 696458** to our distributor network. In many cases, Premier Dealers are realizing the grace period for having a TMT on staff at their dealership is up.

The TMT Test is a Tecumseh-specific 100 question multiple choice test combined with a diagnostic section. This hands-on diagnosis includes one engine and one transmission or drive product. Each multiple choice question is worth 1.5 points and the diagnostic section is worth 50 points. The time allowed to complete the TMT test is 2.5 hours.

The diagnostic portion of the test requires two OPEESA Warranty claim forms to be completed with accuracy. Some potential TMTs have had misconceptions concerning boxes 11 and 12 on the claim form. Box 11 needs to be an accurate and detailed description of what the **technician** found as the source problem (inside the engine or drive unit). This is not what the customer states as the possible problem. Box 12 needs to describe specifically what work was performed on the engine or drive unit to repair what Box 11 describes. If these two boxes are not correct there is a good chance of failing the test, even if you scored high on the multiple choice section.

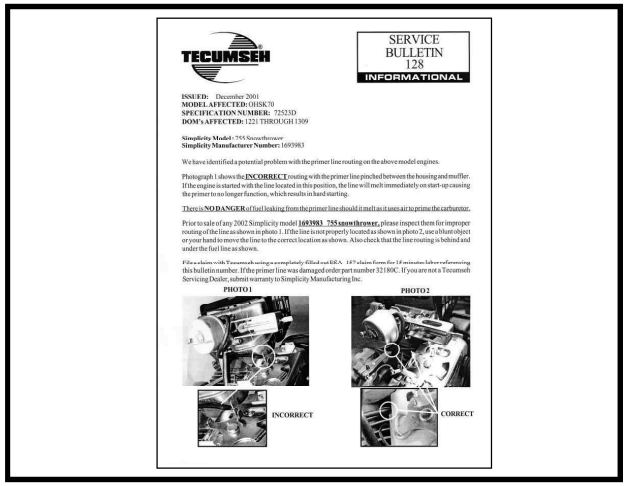




Miscellaneous

Service Bulletin 128

Service bulletin 128 references OHSK70 engine models used on Simplicity snow throwers. Affected engines have DOM's from 1221 through 1309. We have noticed primer lines on some of these units are pinched between the blower housing and the muffler. Upon start up the heat from the muffler will melt the primer line, leaving the priming system inoperative. Pictures supplied in the bulletin demonstrate how to re-route the line to avoid any possibility of melting. It is important to remember that there is no danger of a fuel leak if the primer should melt because our system uses air to prime the carburetor. A copy of the bulletin is included in the back of this book. OHSK70 Primer Line Routing



TECUMSEH

SERVICE BULLETIN 128
INFORMATIONAL

ISSUED: December 2001
MODEL AFFECTED: OHSK70
SPECIFICATION NUMBER: 72523D
DOM's AFFECTED: 1221 THROUGH 1309

Simplicity Model: 755 Snowthrower
Simplicity Manufacturer Number: 1693983

We have identified a potential problem with the primer line routing on the above model engines.

Photograph 1 shows the **INCORRECT** routing with the primer line pinched between the housing and muffler. If the engine is started with the line located in this position, the line will melt immediately on start-up causing the primer to no longer function, which results in hard starting.

There is **NO DANGER** of fuel leaking from the primer line should it melt as it uses air to prime the carburetor.

Prior to sale of any 2002 Simplicity model **1693983 755 snowthrower,** please inspect them for improper routing of the line as shown in photo 1. If the line is not properly located as shown in photo 2, use a blunt object or your hand to move the line to the correct location as shown. Also check that the line routing is behind and under the fuel line as shown.

File a claim with Tecumseh using a completely filled out ESA 187 claim form for 18 minutes labor referencing this bulletin number. If the primer line was damaged order part number 32180C. If you are not a Tecumseh Servicing Dealer, submit warranty to Simplicity Manufacturing Inc.

PHOTO 1

PHOTO 2

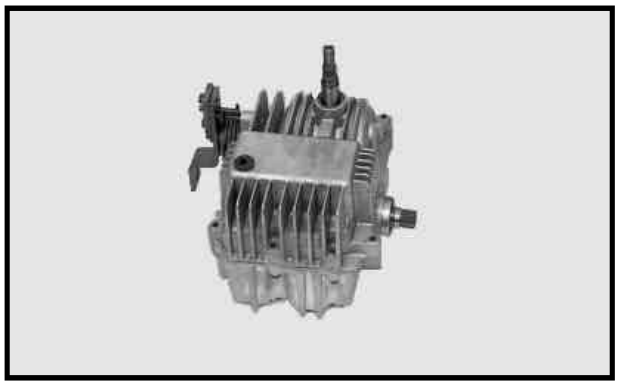
INCORRECT

CORRECT

Transmission and Drive Products

LTH Modules

As a reminder, the hydrostatic module for the LTH transaxle is not a serviceable unit. Should the unit develop a fluid leak, the pump must be changed. The oil in these units is a newly formulated blend. Adding any other type of hydrostatic oil will cause damage to the pump and void the warranty.



4-Cycle Failure Analysis

Intro

When an engine is evaluated in the field the cause of the failure is not always cut and dry. There may be conflicting information leaving questions as to what actually caused the failure. The purpose of this section is to help eliminate the doubt and provide a clearer understanding what causes a failure and what signs will be evident.

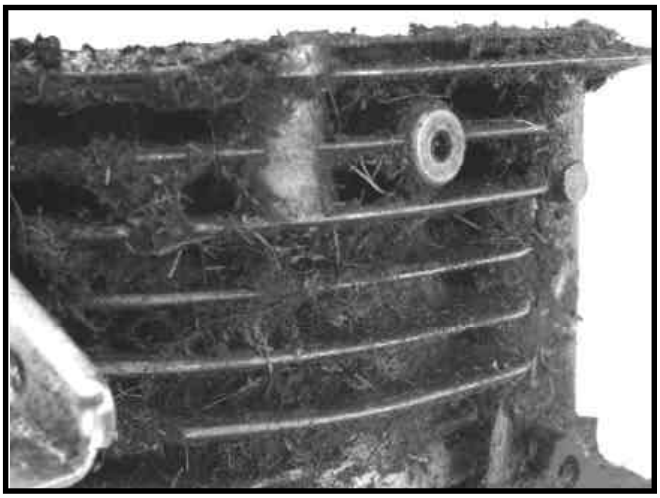
Initial Checks

When a customer brings a failed unit in for repair there are a few quick checks that can be made while the customer is still present. These checks will help you determine what questions need to be asked of the customer to piece together a scenario of what may have happened.

I. **Outside condition of the engine/ equipment**
First impressions can be important. The initial look at an engine can give you a feel for how it has been treated. Some units will come in looking like they just came off the showroom floor, and some will come in looking like they have been through a war. Some technicians suggest taking an instant photograph (Polaroid or digital) of the unit when it first comes in your door. This can help eliminate any possible disputes later on. As they say, “A picture is worth a thousand words”.

Some of the areas to pay attention to include:

a) Cooling fins and flywheel screen- are they clean or packed with debris



b) Air cleaner- is the filter clean
c) Governor linkage- is the linkage intact, does the linkage appear to be in the proper holes
d) Spark plug- correct plug, gap, does the plug wire appear pinched or frayed
e) Condition of the blade- are there large nicks? (This would be on rotary mower engines)

4-Cycle Failure Analysis

II. Engine oil

With the customer present, check the dipstick to see if the oil level is within the operating range. Ask the customer how often they have added oil. If the oil is below the add mark, look for any visible signs of an oil leak. If the oil is above the full mark, ask how much oil they added to the engine. Also, note if the oil smells like gasoline.

Check the condition of the oil. Some of the conditions you may find include:

1. **Burnt smelling -** possible overheating
2. **Oil looks new/unused -** oil may have been added after the failure
3. **Oil has grayish, milky appearance -** water has mixed with the oil
   NOTE: you may notice a grayish, milky residue at the top of the oil dipstick tube. This is a normal occurrence when the ambient air is cooler than the cylinder temperature and condensation accumulates at the top of the filler tube.
4. **Oil is black, thick and sticky -** the oil was not changed within recommended hours of operation or the wrong weight of oil may have been used.
5. **Additives -** Tecumseh does not recommend the use of oil additives. Doing so may cause engine damage.

III. Gasoline

Gasoline has become a major issue in regards to the performance of engines. The more environmentally friendly blends of fuel have a significantly shorter shelf life than the fuels of the past. Fuels will become stale in as little as 15 - 30 days causing them to lose their volatility, and break down leaving harmful deposits. Proper storage needs to be taken so that the gasoline does not become contaminated with water or debris.

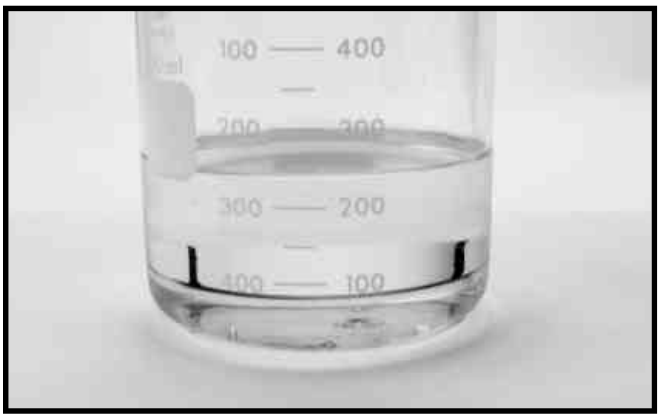
We recommend using ***ULTRA-FRESH™*** fuel stabilizer to minimize the formation of gum deposits during storage.

When inspecting the engine over, remove the gas cap and inspect the gas for the following conditions:

A. **Stale gasoline -** strong odor, dark yellow color, brownish gummy deposits, gasoline will start to go stale in 15 - 30 days

4-Cycle Failure Analysis

B. **Water in gasoline -** place a sample of gas in clear glass container and look for separation.



C. **Debris in gasoline -** shine flashlight into tank or look for sediment in carburetor float bowl. If debris is found, determine if it is foreign or possibly from manufacturing. If engine is new, the customer should get the benefit of the doubt.

Questions to ask the Customer

After the initial checks are made to the engine ask questions relating to your findings. This information will help as you tear down the engine later. Some basic questions you might ask are:

1. How many hours are on the unit?
2. How old is the gasoline?
3. What type of oil was used?
4. How often was oil added?
5. How often was oil changed?
6. Was the carburetor or governor adjusted at any point?
7. How often was the air cleaner checked? Was it ever changed or cleaned?
8. Was the engine brought in for service previously? If yes, when and for what purpose?
9. What is equipment used for? How frequently is the equipment used?
10. How was the engine running immediately before failure?

Tearing down the engine

I. Estimating the run time

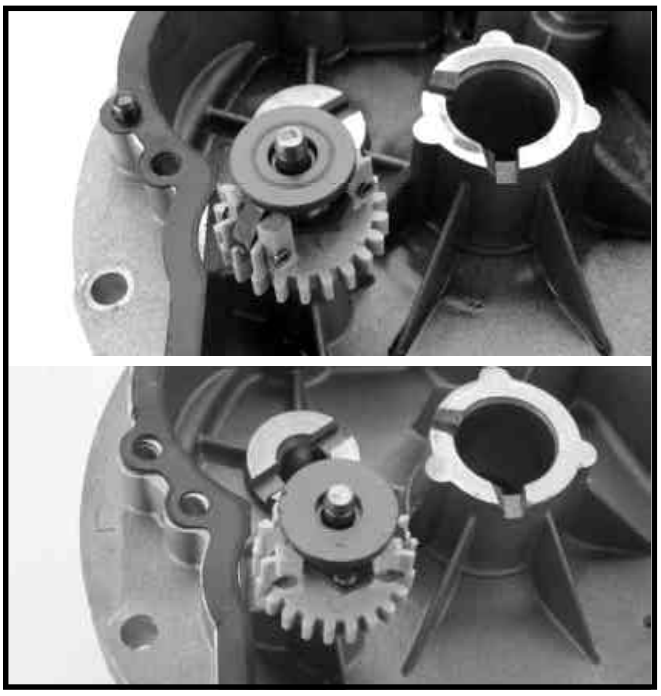
Some failures will occur very early in the life of the engine while some failures may show up further down the road. Some of the areas to look at to determine the approximate amount of run time on an engine include:

Head Gasket-The head gasket will begin to stick after 5 hours of run time.

Cylinder Head- With less than 5 hours of run time the carbon deposits will be soft and oily and easily wiped off with a cloth. If the deposits are heavier and not easily wiped off with a cloth the engine probably has more than 5 hours.

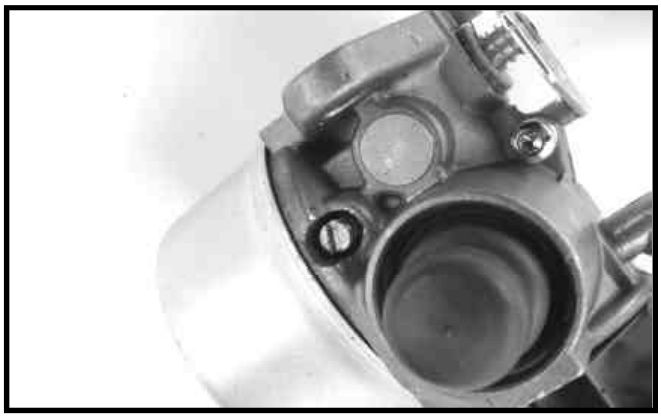
4-Cycle Failure Analysis

Governor gear- A new governor gear will be white in color. The gear will remain white under normal running conditions for approximately 10 hours run time. After that time the gear will turn to a light brown or tan color and should remain that color for the life of the engine. If the gear is dark brown or black, the engine was running at excessive temperatures.



II. Carburetor/intake

The condition of the carburetor can give some tell tale signs for failures such as dirt ingestion, overspeeding, or a lean running condition. Check the condition of the choke shaft and throttle shaft for wear. Check the adjustment on the throttle crack screw. Look for any tampering to the idle screw or the high speed bowl nut. Look for cracks or any other wear to the intake pipe.

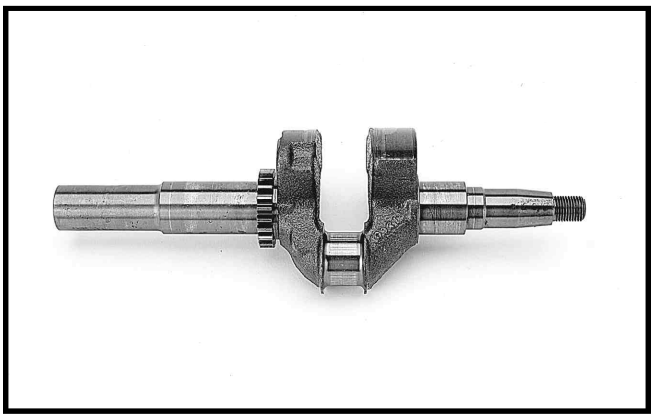


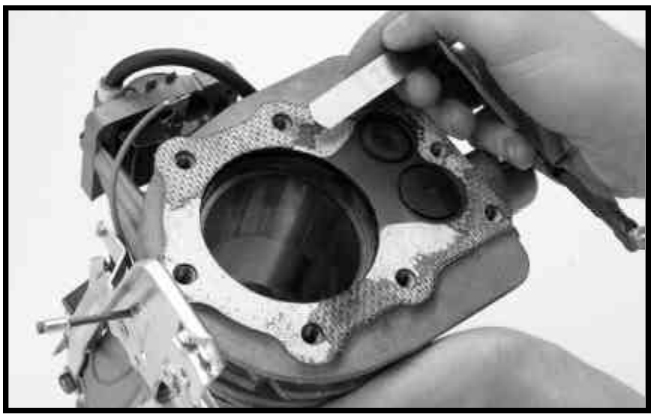
4-Cycle Failure Analysis

III. Bearings

Note the condition of the three main crankshaft bearings. These are often a good indicator for failure analysis. Take measurements of each bearing. Look for aluminum transfer to any of the bearings. Aluminum begins to melt at about 900 degrees Fahrenheit, so aluminum transfer would indicate high temperatures at the bearing surface.

Camshaft bearings typically will not show signs of damage since they do not bear a load.





IV. Cylinder

You also want to examine the condition of the cylinder. Look for any signs of wear or scoring; cross hatching should be evident. Take measurements of the cylinder at three locations.

Also, measure the ring end gap to gage any amounts of wear. Compare your findings to the specifications in the appropriate Technician's Handbook.

V. Connecting rod

Check the rod bolts for tightness. Look for any signs of discoloration. Bluing or blackening are an indication of high heat. Aluminum transfer could also be evident.

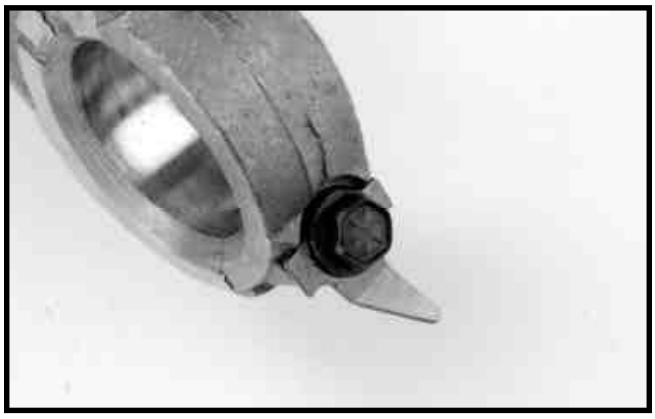
VI. Valves

Check valve lash to make sure they are within specs.

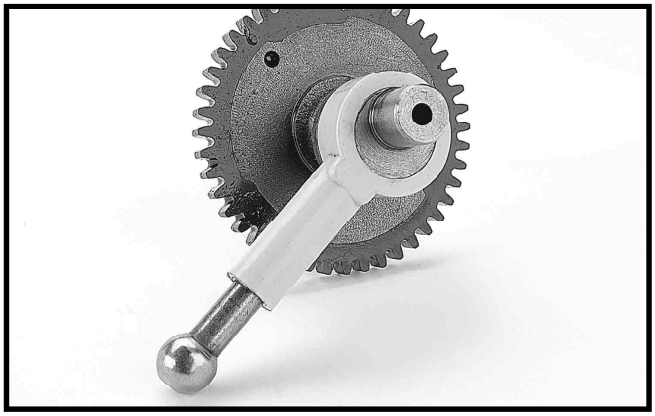
Look at the valve seats for signs that the valves were seating. Make sure the valve spring keepers are intact.

VII. Dipper or oil pump

All horizontal engines use splash lubrication. The dipper should be present and installed correctly.



All Tecumseh vertical shaft engines have a pressurized oil system utilizing an oil pump.



- Rotary engines use a plunger style oil pump; be sure plunger slides freely in barrel
- Large frame engines use a rotary style pump; make sure screen is not blocked use tag wire to verify oil passages are clear.

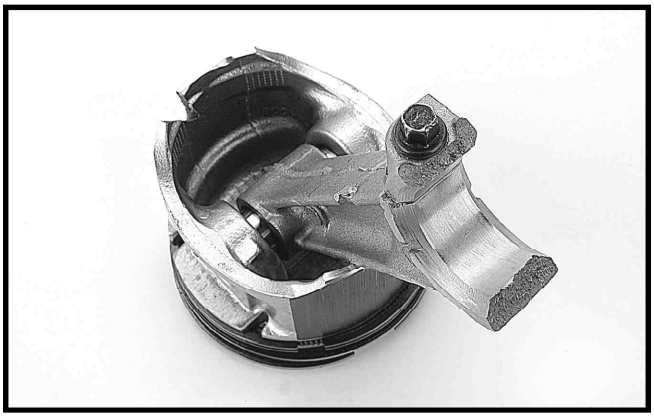
4-Cycle Failure Analysis

Types of Failures

At this point, you have all of the pieces and it is time to put the puzzle together. There are a number of different reasons an engine might fail. When the right information is collected, a sound decision can be made.

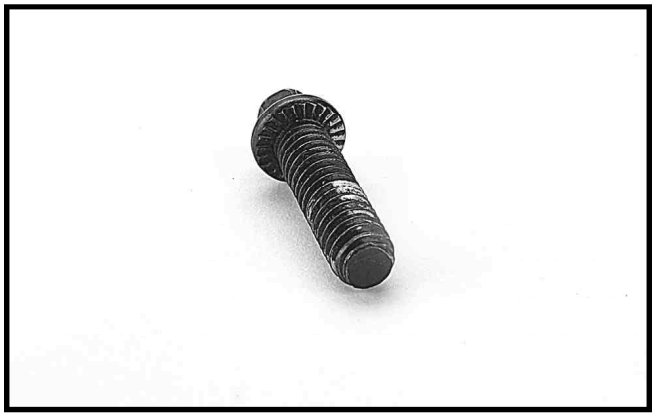
Improperly torqued rod bolts

If an engine has failed due to loose rod bolts, there will be no evidence of seizure to the crankpin bearing. A rod bolt that is not torqued to factory specifications will have no effect on the lubrication of the bearing. The bearing surface may lose its shiny appearance and become dull gray in color.



To determine if the bolts were loose while the engine was running, look where the head of the bolt meets the rod cap. When the rod is properly torqued, serrations from the bottom of the bolt head will be evident. If the bolt is loose the bolt head will pound the serrations flat.

The loose bolt will have the black worn off the threads from scraping the rod cap when it was loose.



Note

When a connecting rod seizes to the crank pin, the rod bolts will loosen due to the heat created. Aluminum transfer will indicate that the bolts loosened after the failure.

Improperly machined bearing surface

There may be a time when an engine is assembled and the clearance of one bearing may be outside of specifications. It is important to remember that this would result in the failure of only one bearing surface, no other bearings would be affected.

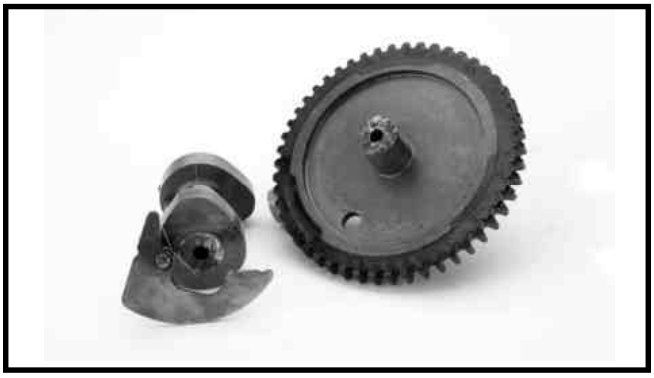
Defect in materials or casting

On occasion, an engine might fail due to a component which may have a porous casting or a void in the casting.

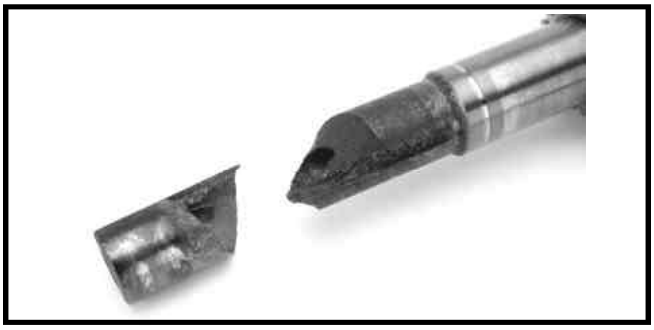
Connecting rod – A connecting rod that does not exhibit any signs of excessive heat such as bluing or blackening may have failed because of poor materials or casting. Often times you will see a void spot in the casting where the initial break occurred

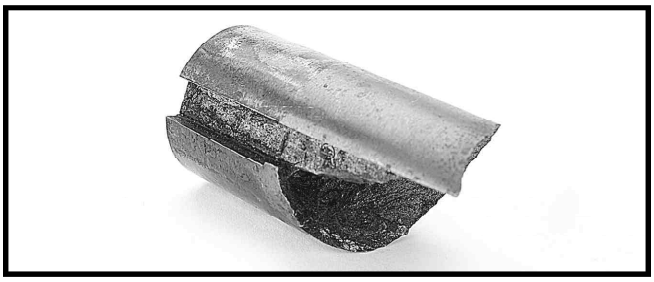
4-Cycle Failure Analysis

Camshaft – A camshaft will typically break between the two lobes, but may also break down near the gear. The gear may lose teeth due to an overload.



Crankshaft - As a general rule broken crankshafts are not considered warranty. To determine if the break is due to a defect in the casting or caused by an external force the break should be analyzed. A spiral shaped break is the result of a torsional bind and would not be considered warranty. A sudden stop to the crankshaft would cause this type of failure. A sign of impact to the right side of the PTO keyway may also be evident.





If impact to both sides of the keyway is seen, the equipment attachment on the crankshaft was loose, creating a "chucking" action. A clean break at the cylinder cover is often caused by a stress such as the incorrect chain on a clutch or a generator that was dropped. A clean break could be a defect in casting if voids are seen in the fracture.

The crankshaft gear could spin on the shaft if it is pressed on, or it could crack if it is keyed on. This would cause the engine to run out time. This failure is caused by a sudden stop to the crank shaft and would not be a warranty situation.

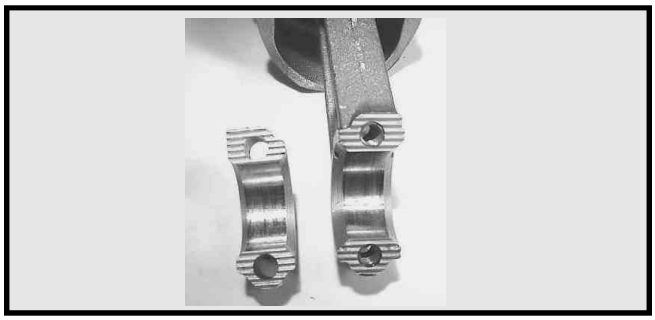
Cylinder Block - Check for oil leaks externally on the engine. If they don't appear to be coming from a seal or gasket, check for a porous casting in the block

No oil start

A no oil start seizure will occur within a few minutes of start up. Typically the engine will seize but not fail immediately. The engine may be restarted several times before the complete failure occurs. However, most engines under these conditions will fail early.

With a no oil start the signs of low running time will be evident. The amount of damage to the bearing surfaces will differ from a vertical shaft engine to a horizontal shaft engine. A vertical shaft engine utilizes an oil pump which draws oil from the lowest part of the engine. Even when an engine has been drained of all oil there will be a residual amount left in the crank case. This small amount will still be pumped through to feed the crankshaft bearings. The cylinder however will not receive oil and will seize.

The crankshaft bearings will appear ok.



Horizontal shaft engines use an oil dipper as a means of lubrication. When an engine is started with only the residual oil in the crankcase the dipper will not be able to reach the oil and none of the bearings will receive lubrication. The crankshaft bearings will show signs of aluminum transfer. The cylinder will also show signs of scoring.

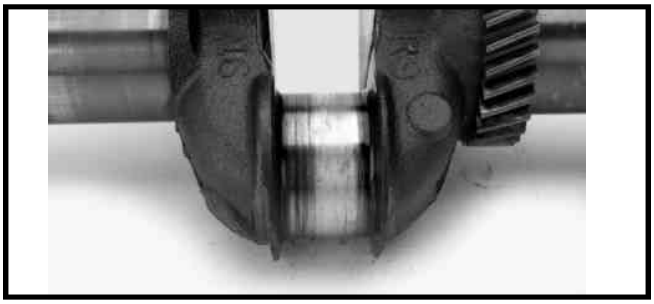
After the initial seizure, oil may be added and the engine will probably restart. The initial seizure will cause scoring which will worsen as the engine runs and the engine will fail catastrophically after a short time.

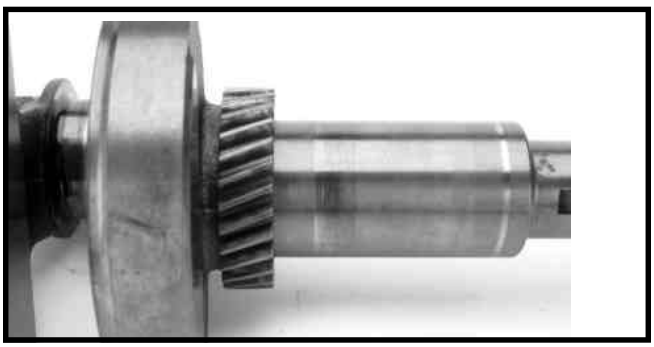
4-Cycle Failure Analysis

Low Oil
Low oil is probably the most common cause of engine failure. When a low oil failure is first assumed, it is important to first inspect the engine for oil leaks. We recommend operators check their oil before each use. The oil level must be maintained between the full and add marks on the dipstick. If a customer runs the engine low on oil partly due to a slow oil leak, it would be considered lack of proper maintenance. If the engine produces a major oil leak, such as a lower oil seal failure, the condition may be unavoidable and should be warranty if within the warranty period.

Indications that an engine was run low on oil will include:

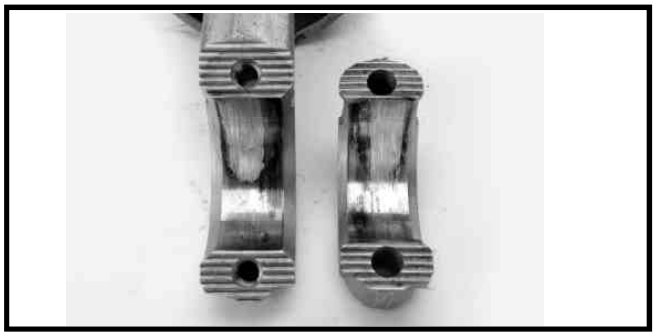
- Scoring to all three major crankshaft bearing surfaces, including aluminum transfer to the crank shaft journal.



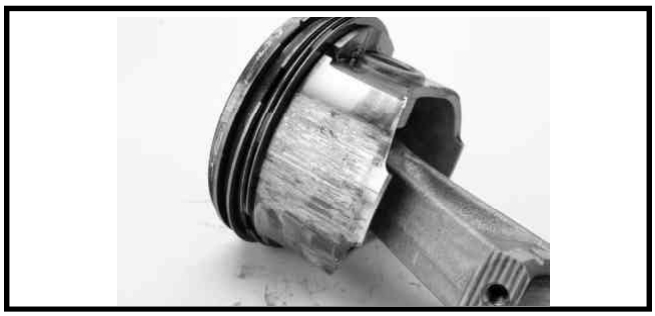


- An engine equipped with a bronze PTO bushing will not show any aluminum transfer but will show some black burn marks to the bushing.

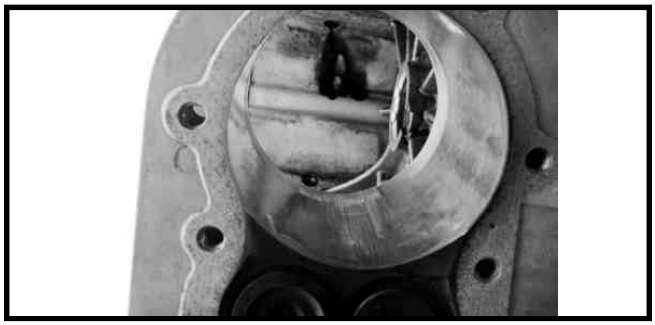
- The connecting rod will show aluminum transfer and will usually be broken.



- The piston will be scored.



- The cylinder will show scoring, the heaviest being on the thrust side.
- The oil will be dark and gritty from aluminum wear.

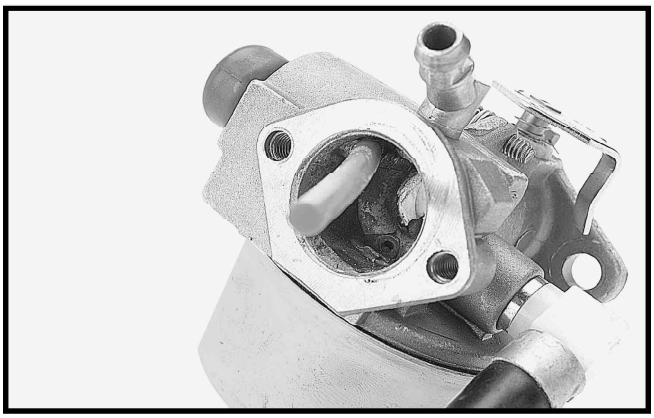


4-Cycle Failure Analysis

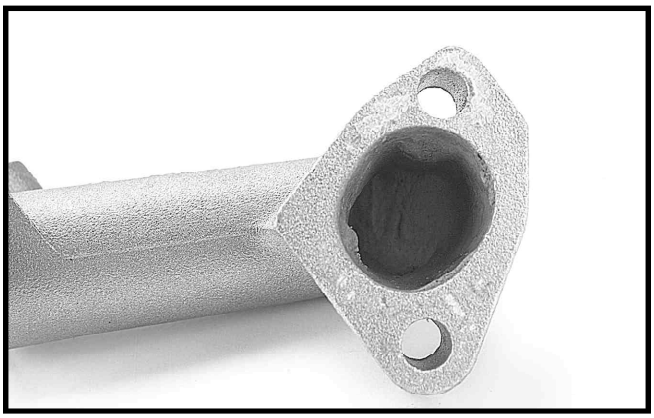
Dirt Ingestion
Dirt ingestion could happen one of two ways: through the intake system or through an air leak in the crankcase.

When dirt has entered the engine crankcase, such as through a leaking seal or gasket, the scuffing will show at the bottom of the cylinder as well as the bottom of the piston skirt. Evidence of wear will also show on the bearings.

When it is assumed that dirt was ingested through the intake, first follow the trail through the entire intake system. Look for evidence that the dirt has by-passed the air cleaner. Often you will see a dirt track in the carburetor venturi or a worn throttle shaft.

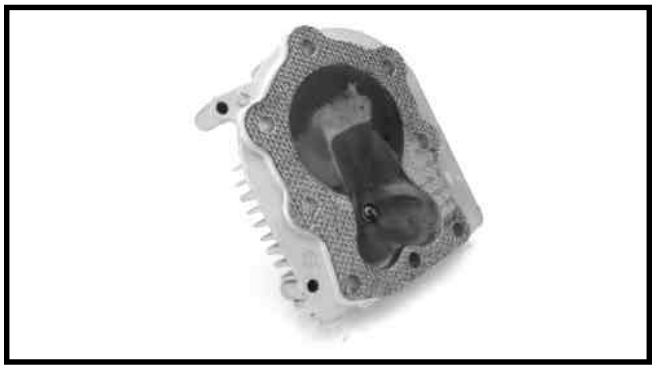


The intake pipe will also show a dirt track leading to the cylinder head.

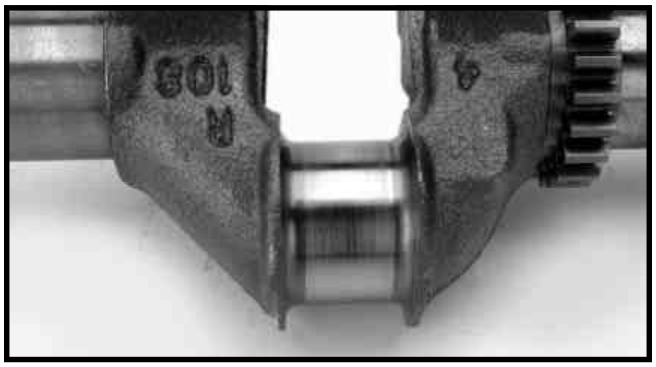


The cylinder will show scratching along the walls and the crosshatch will typically be worn away.

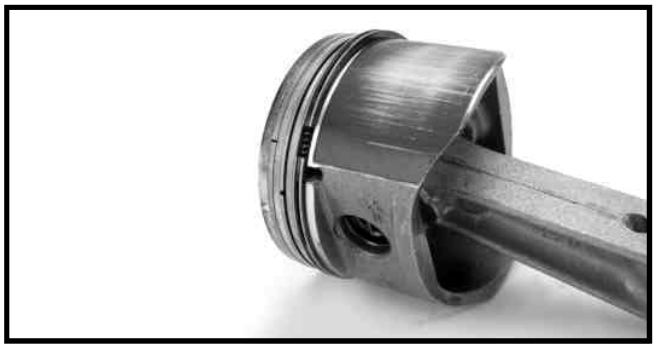
Debris may be burnt onto inside of the cylinder head and on top of the piston.



The bearings in the crank case will all start to show wear, predominantly on the crankshaft journal.



The piston will show scuffing.

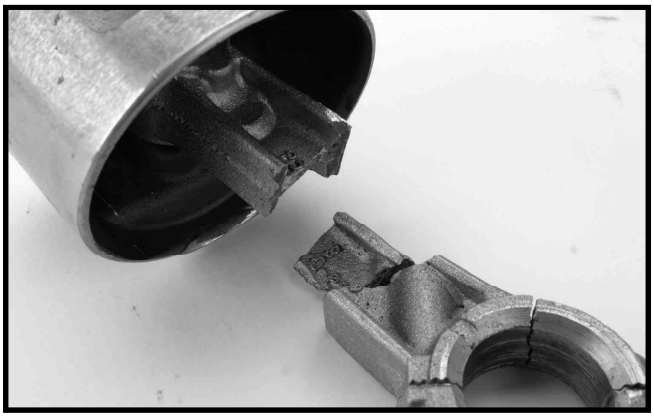


4-Cycle Failure Analysis

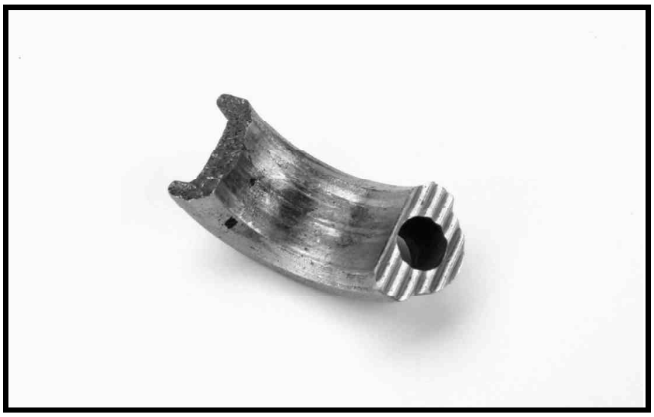
Overspeeding

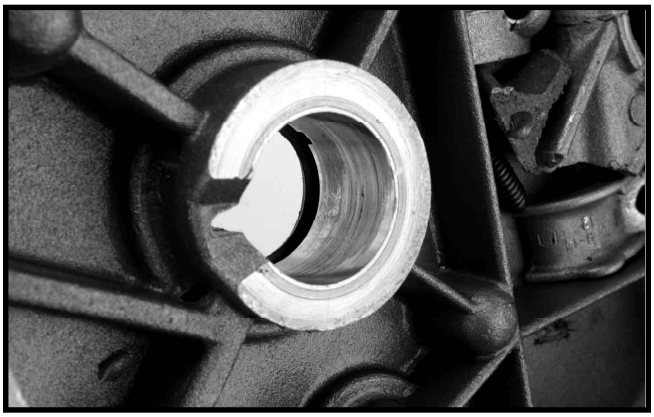
All engines have a specified high speed RPM. When an engine goes over the recommended RPMs for the engine it runs a risk of breaking a connecting rod, breaking the valve spring retainer, or creating a bearing seizure.

When a connecting rod breaks due to an overspeeding failure, the break will be near the wrist pin high up on the connecting rod.

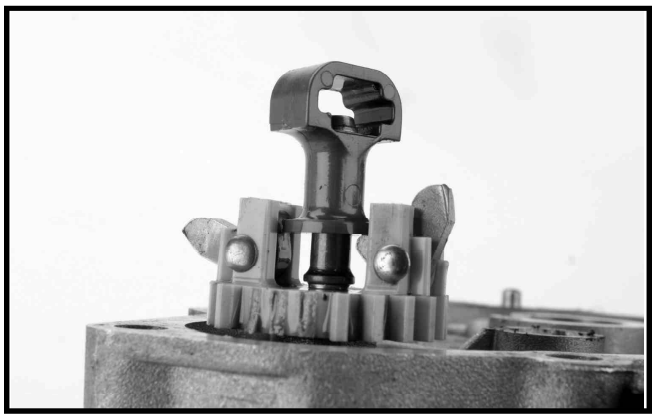


Overspeeding will increase the temperature inside the engine and aluminum transfer and burning will be evident at the bearing surfaces. The cylinder will show some signs of scoring but no signs of seizure.





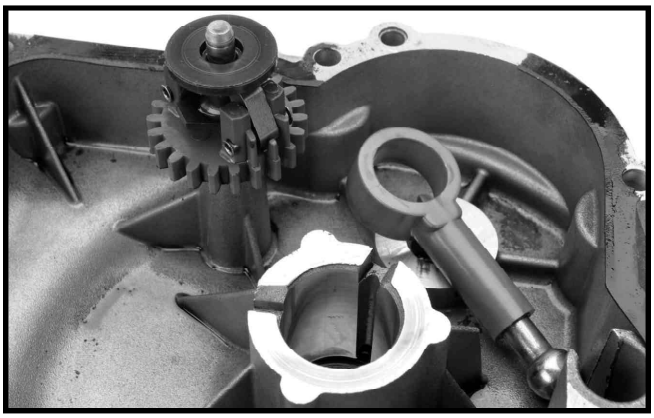
When overspeeding is the failure, look for signs of problems with the governor both internally and externally. The governor could be mis-assembled inside the engine or the part could be faulty. On the outside the governor linkage could be damaged in some way.



4-Cycle Failure Analysis

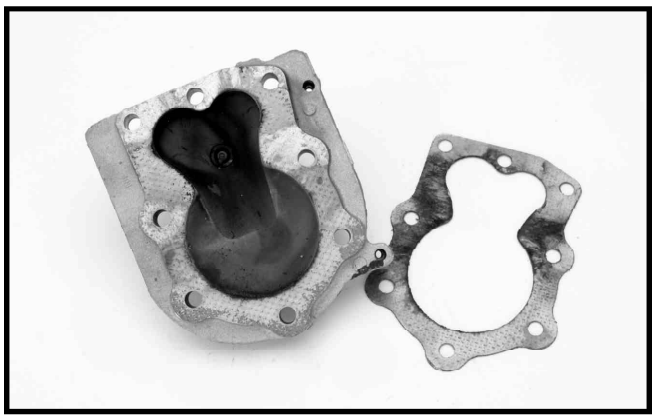
Overheating

Air cooled engines require proper maintenance to maintain normal operating temperatures. This includes keeping the cooling fins clean. An air-cooled engine must have air circulating around the block to keep the running temperature down. The first sign that an engine may have failed due to running at excessive temperatures will be burned oil smelling. The oil will have a caramelized appearance and the governor gear will be a very dark brown color.



The piston will have discoloration on the outside as well as on the bottom.

The high temperatures could also cause the engine to blow a head gasket.



2-Cycle Failure Analysis

Lack of Lubrication

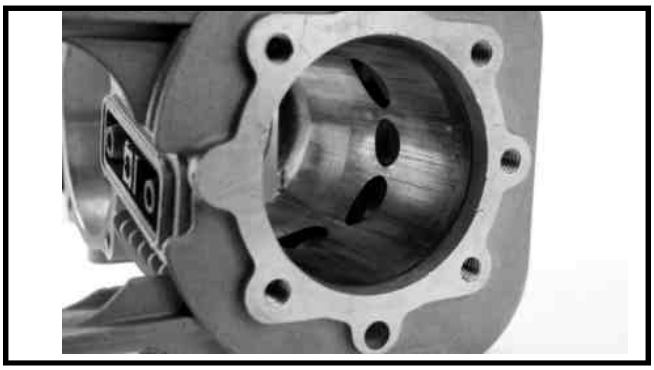
Two cycle engines run on a fuel/oil mix. The most common failure for a 2-cycle engine is a failure to add any or enough oil to the gas. The amount of oil required varies from engine to engine. All current Tecumseh 2-cycle engines will use a 24:1, 32:1, or a 50:1 fuel to oil mix ratio.

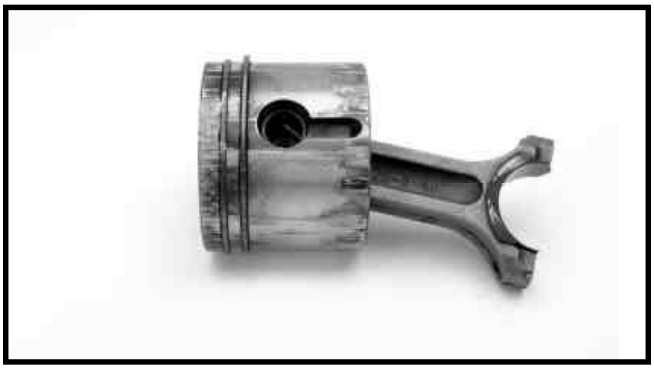
ENGINE FUEL MIX

	U.S.	U.S.	METRIC	METRIC
	Gasoline	Amount of Oil To Be Added	Petrol	Amount of Oil To Be Added
24:1	1 Gallon 2 Gallons	5.3 oz. 10.7 oz.	4 Liters 8 Liters	167 ml 333 ml
32:1	1 Gallon 2 Gallons	4 oz. 8 oz.	4 Liters 8 Liters	125 ml 250 ml
50:1	1 Gallon 2 Gallons	2.5 oz. 5.0 oz.	4 Liters 8 Liters	80 ml 160 ml

It would not be possible to determine if a customers unit was run without the proper mix just by looking at the fuel in the tank. There are tell tale signs to show that an engine failed because it lacked the proper lubrication.

The first noticeable area of failure will be the cylinder and piston. To make an accurate analysis the piston will have to be removed. An engine run without the proper amount of oil will show scoring around the entire piston and cylinder.

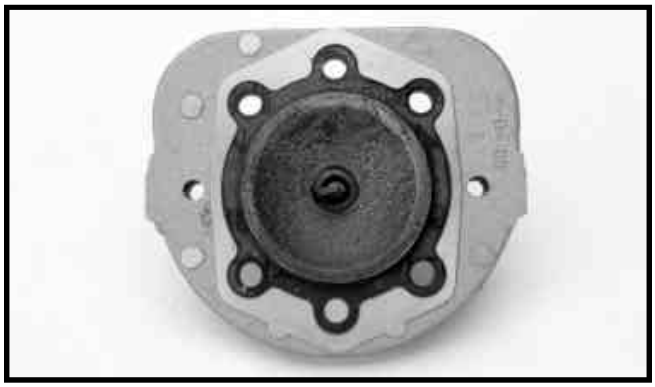




The next step would be to look for any signs of oil left in the crank case. Search areas such as behind the piston rings, behind the needle bearing retainer on the connecting rod, and the exhaust port.

The exhaust port would have a very dry carbon if the engine did not have enough oil in the fuel.

The head and spark plug would have a dry carbon as well.



Oil in a crankcase will not evaporate, so even if the engine was left sitting for an extended period of time before the evaluation, oil would still be present.

2-Cycle Failure Analysis

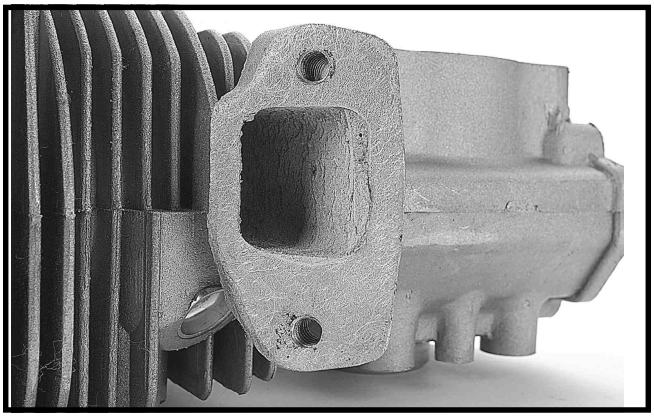
Lean Running

A 2-cycle engine could fail because of a lean running condition. A lean running engine will show signs of improper lubrication even if the fuel /oil mix was correct. The major difference will be the condition of the cylinder. The lean condition will cause the engine to run hot. The engine will show signs of failure at the hottest part of the cylinder first, which would be the exhaust port side. The cylinder and piston will have scoring on this side and it will not spread the full circumference of the piston. The crankcase will also show some signs of oil.

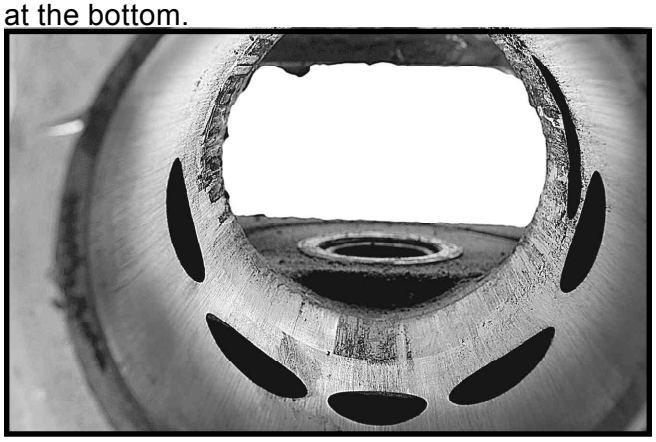
Since carburetors are no longer adjustable, much of the blame for a lean running engine can be taken away from the customer. An engine could be running lean because of an air leak somewhere in the crankcase.

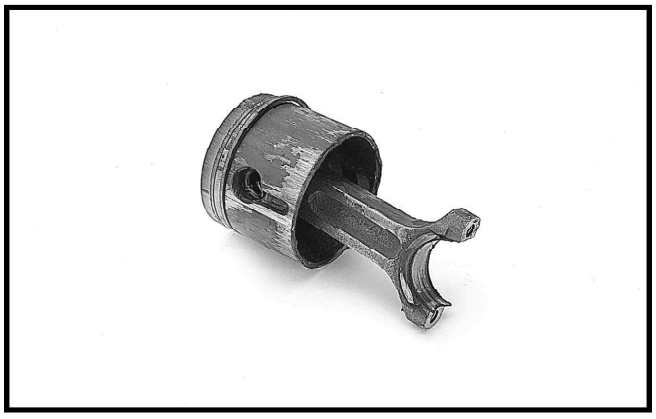
Dirt Ingestion

When a 2-cycle engine ingests dirt, it will typically loose compression before it will seize or break a connecting rod. When an engine fails for this reason, signs of dirt will be evident throughout the engine. The dirt could be drawn into the engine through the carburetor or through a crankcase leak.

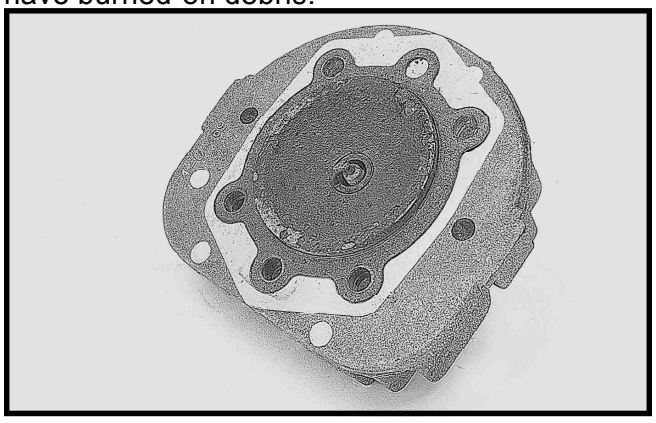


Either way there will be dirt deposits in the crankcase. The cylinder will show scoring around the whole circumference with the heaviest scoring at the bottom.





The cylinder head and the top of the piston will have burned-on debris.



Transmission and Drive Products Failure Analysis

Types of Failures:

Non Warranty
- lack of lubrication, improper lubrication
- improper shifting
- accident, abuse, or neglect
  e.g.- bent axles, water in transmission, overloading (due to pulling heavy objects or using ground engaging equipment, unless specified)

Possible warranty
- leaking
- noisy
- hard shifting

Initial troubleshooting

The first rule in transaxle troubleshooting is to isolate the problem to the transaxle. Check for proper adjustment of belts, brake clutch, shifter and linkages. Check pulleys for sheared retainers and proper belt disengagement. If the problem is related to shift difficulties remove drive belt and recheck shifting to assure problem is not with associated equipment.

On all in-line shift models 700, 800, 900, or MST Series, shifting force or effort should be the same with the engine running as not running. If not equal, check the following areas: clutch adjustment, brake adjustment, belt release, and belt guide positioning.

The transaxle and transmission models listed above are in-line shift mechanical gear drive models that use shift keys to engage a desired gear to lock and rotate with the shaft. This type of unit requires the transaxle or transmission to be in a no-load condition (de-clutched) when gear selection occurs. De-clutching allows the unit to have the input and brake forces removed from the gears and shift keys, which allows the unit to turn freely.

Isolating the unit from the transaxle
Use the following procedure to determine if a hard shifting condition is caused by the shifter/clutch linkage or an internal problem of the transaxle.

1. On level ground, and with the engine running, proceed to shift through the gears with the clutch pedal depressed (engaged).

2. If shifting is difficult, try shifting the transaxle with the engine shut off.

3. If the transaxle shifts freely through each gear with the engine shut off, the cause of the shifting problem is external to the unit. **DO NOT REMOVE THE TRANSAXLE**

4. If shifting the unit with the engine shut off is difficult, then disconnect the linkage from the shifter rod and shift through the gears with an open end wrench and compare the shift effort.

5. Check the clutch, shifter, and brake linkage for the proper adjustment by using the guidelines provided by the owner's manual for the unit or the Tecumseh Technician's Handbook.

Hard shifting with the engine shut off can be caused by:
1. Bent or binding shift lever or linkage

2. Shift linkage out of adjustment

3. Corrosion in the transaxle or transmission

Transmission and Drive Products Failure Analysis

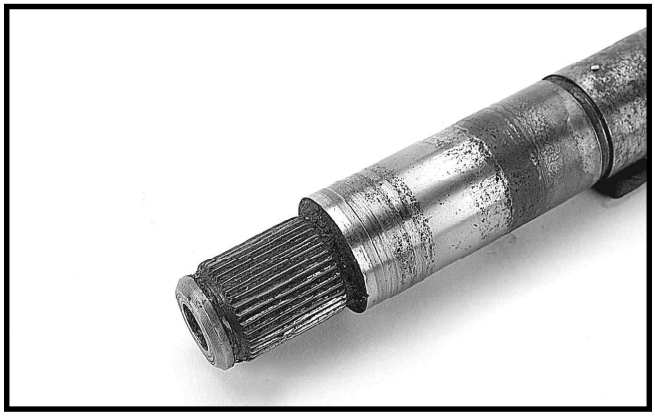
Some Original Equipment Manufacturers (OEMs) use these transaxles and transmissions in lawn tractors that do not use a foot operated clutch. These lawn tractors combine the clutch release mechanism with the hand operated gear shift lever. When the gear shift lever is moved through the shift gate from the gear engagement position toward the neutral position, the attached clutch linkage moves the idler pulley to release all input drive belt tension from the transaxle input pulley. With the drive belt tension released (clutch engaged), the transaxle is able to shift. Tecumseh/ Peerless limited warranty covers defects in materials and/ or workmanship. Worn shift keys caused by improperly adjusted clutch/ belt linkages are not covered.

4. Damaged shift keys, gears, or shifter brake shaft.

5. Belt guides missing or improperly adjusted(to close or to far away, see equipment manufacturer specs).

If the cause is internal, remove the unit from the tractor, disassemble, and determine the cause of the failure.

Lack of Lubrication/ Improper Lubrication
Tecumseh Peerless transaxles use two forms of lubrication. They will either contain 80W90 oil or Betonite Grease. Bentonite grease is a specially formulated, clay based grease and no other substitute is acceptable.



Symptoms of a transmission that is low on oil or grease or contains the improper type of lubrication may include:

- transaxle is noisy
- difficult shifting
- overheating

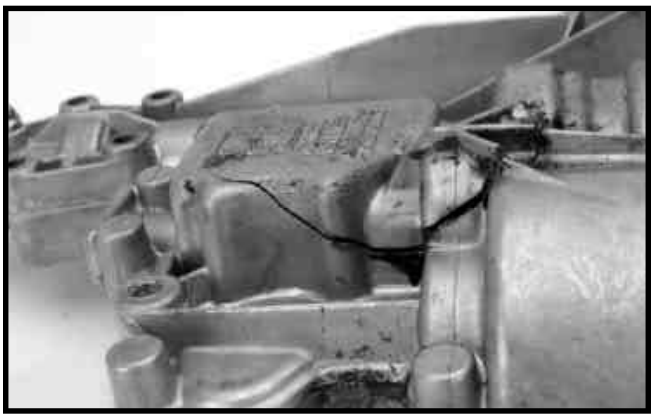
As a note, Bentonite grease should **not** be used to pack needle bearings. Because of the gritty nature of the grease, needle bearings would wear out in a very short time. Needle bearings are protected inside the transmission by O-rings.

Improper Shifting
As mentioned earlier, all in-line shift transmissions require the clutch to be engaged when shifting. Some of the symptoms that may be exhibited when a transaxle is not operating properly because it has not been shifted properly include:

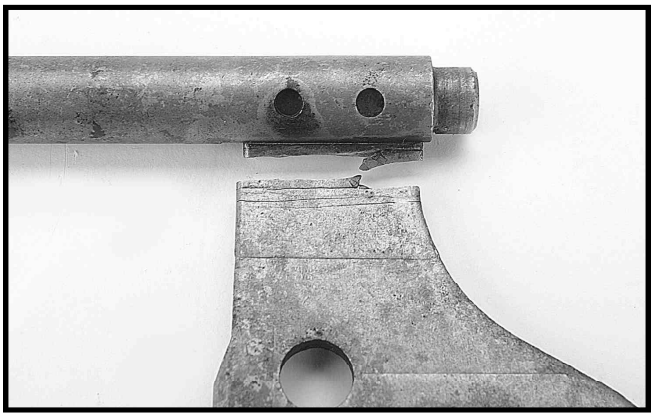
- jumps out of gear
- transaxle will not shift properly into all gears
- transaxle will be difficult to shift or will not shift at all

Transmission and Drive Products Failure Analysis

Shifting while on an incline, shifting while towing any type of load, or shifting without de-clutching forces the shift keys to engage into a gear that is in a loaded condition.



Improper shifting is considered abuse because it leads to pre-mature wear and failure of the shift keys and drive gears. Upon disassembly of the transmission, the first part to check would be the shift fork assembly.



A bent or broken shift fork would be a good indication that the operator was shifting without properly engaging the clutch. The next parts to inspect would be the shift keys. The shift keys would be worn and possibly chipped when this type of failure has occurred. The shift washers may also show signs of damage. The internal lug portion of the gear may also be rounded or chipped.

Please remember, Tecumseh's limited warranty covers only transaxle or transmission failures that are the result of a defect in the material or workmanship of the unit, not failures caused by abuse or wear.

A shift fork will typically bend before it breaks. If the shift fork looks like it was bending under stress and then broke the transmission was being shifted under load. You may also see wear to the shift pins, another indication the transmission was being improperly shifted.

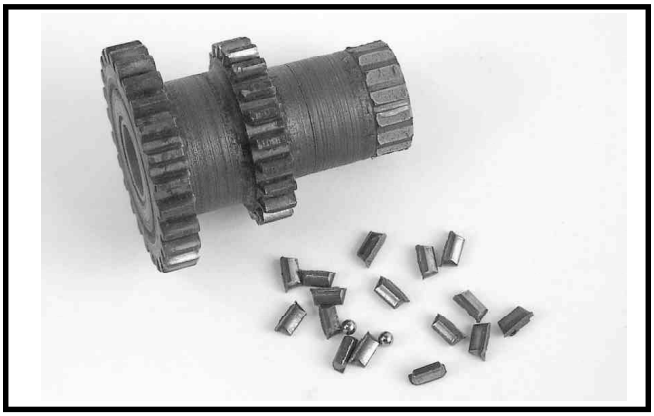
Accident, abuse or neglect

This type of failure should appear obvious from initial inspection. A bent or broken axle is not considered a warrantable defect. This type of failure often happens when a unit is dropped.

Transmission and Drive Products Failure Analysis

Water inside of the transaxle would not be considered warranty under most cases. All of our current transmissions are sealed and water could only get into the unit by seeping in if it was submerged or under extreme pressure (ie - pressure washer). Under normal operating conditions and use, water will not find its way into the case of the transmission. Once rust is discovered on the internal components of the transaxle, the entire transaxle should be replaced.

Only the recommended tire size should be used. The 5th or 6th gears are most prone to break in a transmission. While they are thinner gears, they are really breaking because the tire size being used is larger than recommended (ie-23" instead of 20") which stresses the gears.

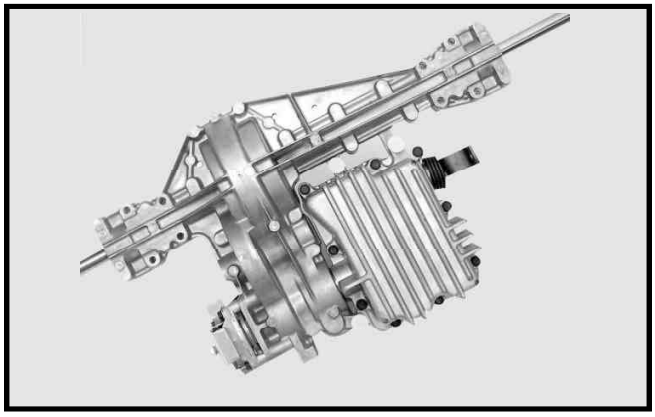


Overloading will cause teeth to break off the lower, thicker gears, and cause the higher, thinner gears to break in half. It will also crack the case. Look for signs that the customer may have been using the equipment to pull a trailer, or ground engaging equipment, which may have overloaded the transaxle.

VST and LTH Failure Analysis

The VST model transmission and the pump to the LTH model are considered non-serviceable. This of course limits the extent of what may be done for failure analysis. However, checks can be made to determine what the cause of failure is. Please refer to the proper Technician's Handbook for steps on determining if the problem is external to the transmission.

Some possible failures with these transmissions may include loss of speed, no power/ will not drive uphill, will not move, will not drive in reverse, or makes noise.



VST TROUBLESHOOTING

Do not use this information to attempt any internal repairs. Tecumseh's current policy on hydrostatic transaxles that have internal failures is to replace the complete unit. This has not changed. However, we would like to provide a failure checklist to assist in making an accurate evaluation of the complete tractor to eliminate any unnecessary replacements. Here is a list of items to check and corrective actions to take.

To properly test the unit for power loss:

1. Allow the unit to cool before trying the following steps.

2. Put the shift lever in a position that is 1/2 (12.7 mm) of the travel distance from neutral to forward.

3. Place the tractor on a 17 degree grade.

4. Drive the tractor up the grade (without the mower deck engaged). The loss of power experienced should be approximately 20%. This is considered normal. If the loss of power is approximately 50%, this would be considered excessive.

5. Bring the unit to neutral, shift into forward and note the response. Care should be taken to move the lever slowly to avoid an abrupt wheel lift.

To determine if the problem is with the hydro unit, all external problem possibilities must be eliminated. Here are some potential problem areas.

1. **Overheating:** Heat can cause a breakdown in the viscosity of the oil which reduces the pressure used to move the motor. Remove any grass, debris, or dirt buildup on the transaxle cover and/or between the cooling fins and fan. Buildup of material will reduce the cooling efficiency.

2. **Belt slippage:** A belt that is worn, stretched, or the wrong belt (too large or wide) can cause belt slippage. This condition may show the same loss of power symptom as overheating. Typically, the unit which has a slipping belt will exhibit a pulsating type motion of the mower. This can be verified visually by watching the belt and pulley relationship. If the belt is slipping, it will chatter or jump on the pulley. If the belt is good, a smooth rotation will be seen. Replace the belt and inspect the pulley for damage.

3. **Leakage:** The VST and 1800 Series have two oil reservoirs which can be checked for diagnostic purposes. The first is the pump and motor expansion bellows. With a small diameter blunt or round nose probe, check the bellows depth through the center vent hole. Proper depth from the edge of that hole is 3-1/4 to 3-1/2 inches (8.25 - 8.9 cm).

   The second chamber is for the output gears including the differential. FIRST make sure the tractor is level, then remove the drain/fill plug. NOTE: Some units that do not have differential disconnect will have two plugs. We recommend using only the primary plug. Insert a small pocket rule until you touch the bottom of the case. Remove it and check for 1/4 -3/8 inches (6.5 - 9.5 mm) contact; this is full at its 8oz. (236 ml) capacity.

4. **Low ground speed:** If the linkage is not synchronized to absolute neutral, or the shift lever is not properly fastened to the tapered control shaft, full forward travel may not be achieved. This may cause a false reading and be misdiagnosed as a low power condition. This also could be caused by the brake not releasing.

   To determine absolute neutral, the hole in the tapered control shaft must face straight up and down. At this point make sure the OEM linkage is in neutral. To properly fasten the control lever to the shaft, torque the nut to 25-35 ft.lbs. (34 - 48.3 Nm) with the shaft and the lever in neutral.

When attaching the shifter arm to the shaft, you must prevent any rotation during torquing. This can be done by placing a long 5/16" (7.94 mm) bolt in the hole as shown in illustration. Hold the bolt until the tapers are locked and the nut torque is correct.

To make sure that the brake is not binding, drive the unit up a slight grade. Position the speed control lever into neutral. The unit should coast backward. If the unit does not coast back slowly, the brake is not released from the brake disk. Adjust the brake linkage to release the brake completely when the foot pedal is released.

5. **Hard to shift:** Typically, hard to shift symptoms are not caused by the hydrostatic unit. The shift arm should move with relative ease. Check the ease of movement of the shift arm with a torque wrench. For the following spec numbers, the reading should be 40-65 inch lbs (4.5-7.34 mm). measured at the end of the shaft (205006, 016, 021, 022, 030, 033, 036, 040, 046). If the model has a neutral spring, the torque reading should be 70-150 inch lbs. (7.9-16.9 mm). All other models (without neutral return spring) should read 150 - 120 inch lbs. (13.5-16.9 mm) measured at the end of the shaft. Binding may occur in the linkage connections due to rust or moisture. Lubricating these connections and checking for bent or damaged parts should resolve hard shifting.

PEESA
OUTDOOR POWER EQUIPMENT AND ENGINE SERVICE ASSOCIATION

WARRANTY CLAIM

NO. A

2 WARRANTY CODE NO.

PLEASE TYPE OR PRINT CLEARLY

1 TYPE OF CLAIM (CHECK ONLY ONE)

☐ Warranty Repair ☐ New Defective Service Parts
☐ Policy Adjustment ☐ Questionable/Disputed

✓ FOR
☐ Kohler
☐ Tecumseh
☐ US Motor Power

4 WARRANTY PERFORMED BY ☐CD ☐SD ☐DEALER

Firm Name

Address

City State

Phone Zip Code

Signed

3 OWNER'S LAST NAME | **COMMERCIAL USER** ☐ YES ☐ NO

FIRST MI

ADDRESS

CITY STATE

PHONE ZIP

Customer Signature

Purchased Date			Failure Date			Repair Date		
Mo.	Day	Yr.	Mo.	Day	Yr.	Mo.	Day	Yr.

6 HOURS USED | **7 UNIT ORIGINALLY SOLD BY**

5 Engine/Transmission Short Block/Model No. | **Spec No.** | **D.O.M. or Serial No.**

Equipment Manufacturer | **Type of Equipment** | **Engine Received** ☐ Mounted ☐ Detached

8 PARTS HAVE BEEN
☐ Returned to Factory ☐ Returned to Central ☐ Retained & Tagged

9 DEFECTIVE PART NUMBER

10 FAILURE SUFFIX

FAILURE SUFFIXES

AW- Assembled Wrong
BC- Broken/Cracked
BL- Blown
BT- Bent/Twisted
CD- Porous/Casting Deficiency
CL- Came Loose/Off
CP- Corroded/Pitted
EF- Electric Failure
FM- Foreign Material
IF- Improper Fit
LK- Leaked
MI- Missing
ML- Magnet Loose
NS- Not Seating
NY- Noisy
OA- Out of Adjustment
PM- Part Made/ Machined Incorrectly
SD- Shipping Damage
SG- Scored/Galled
SS- Stuck/Seized
ST- Stripped
UO- Unknown/Other
VC- Valve/Clearance
WN- Worn
WP- Warped

11 Condition Found/Probable Cause of Failure (Word "Defective" Not Sufficient)

12 Job Number/Work Performed. If Necessary to Remove & Replace (R&R) Engine from Equipment, then Show R&R Separately.

13 Miscellaneous	Dollars	Cents
Freight/Postage Allowance Attach Freight Bill		

14 Labor	HRS.	MINS./TENTHS	JOB#
Repair 1			
Repair 2			
Repair 3			
Misc. Labor			
R & R			
TOTAL			

16 Part Number	Qty.	Description

15 FACTORY USE ONLY

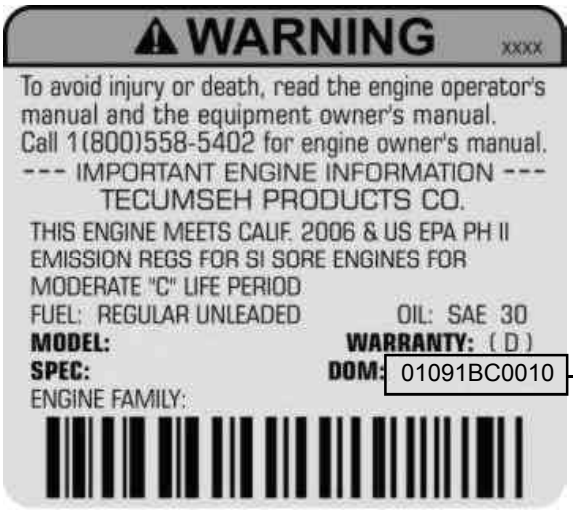
OEM Code	
Defect Code #	
End Use Code #	
Division	

17 Engine/Short Block/Transmission (Authorized Signature Req d)

Authorized By:

Firm Name:

ESA 157R



Year 2001	Day of Year 91st	Mfg Facility	Assembly Line Shift	Individual Serial # 10th unit built
01	091	B	C	0010

INSTRUCTIONS
FILLING OUT THE "NEW" OPEESA WARRANTY CLAIM FORM

BOX 1 TYPE OF CLAIM

Check the appropriate box for the type of claim being filed. Your choices are:
WARRANTY REPAIR: - normal in-warranty repair due to a defect in material or workmanship.
NEW DEFECTIVE SERVICE PART: service part (s) received defective or missing components.
POLICY ADJUSTMENT: repair that has been pre-authorized by your ASD, CWD, or Tecumseh Representative.
QUESTIONABLE/DISPUTED: if the customer requests warranty service and you think he/she is not entitled. Remember, ship claim with parts to TECUMSEH SERVICE, GRAFTON, WI 53024.

PLEASE TYPE OR PRINT CLEARLY		✓ FOR
1 TYPE OF CLAIM (CHECK ONLY ONE)		☐ Kohler
☐ Warranty Repair	☐ New Defective Service Parts	☐ Tecumseh
☐ Policy Adjustment	☐ Questionable/Disputed	☐ US Motor Power

BOX 2 WARRANTY CODE NO.:

Enter your assigned Tecumseh five digit dealer identification number. Without this number, we cannot identify who to pay.

2 WARRANTY CODE NO.
1000K

BOX 3 OWNER INFORMATION:

All owner information must be completed including the customer signature or the individual who accepts the repaired merchandise. IMPORTANT: You must check the appropriate box for commercial or non-commercial use.

3 OWNER'S LAST NAME	COMMERCIAL USER
Doe	☐ YES ☒ NO
FIRST: John	MI:
ADDRESS: 400 Main Street	
CITY: Hometown	STATE: WI
PHONE: 414-377-2700	ZIP: 53000
Customer Signature	

BOX 4 WARRANTY PERFORMED BY: PURCHASE/FAILURE/REPAIR DATES:
Check one of the three boxes that indicates the type of Tecumseh dealership or distributorship. Your company name/ address as it appears on your service agreement. The purchase/failure/repair dates MUST be completed for warranty consideration.

4 WARRANTY PERFORMED BY ☐CD ☐SD ☒DEALER								
Firm Name: Jeff's Repair								
Address: 900 North Street								
City: Grafton			State: WI					
Phone: (262) 377-2700			Zip Code: 53000					
Signed: Jeff Doe								
Purchased Date			Failure Date			Repair Date		
Mo.	Day	Yr.	Mo.	Day	Yr.	Mo.	Day	Yr.
7	10	01	9	8	01	9	9	01

BOX 5 ENGINE/TRANSMISSION INFORMATION:
Enter the entire model, specification, serial (DOM) number of the engine/transmission being repaired. When a repair is performed to a short block, enter the short block model and serial number. Check the appropriate box to indicate if the equipment was received mounted or detached from the OEM's equipment.

EXAMPLES:

	MODEL	SPECIFICATION	SERIAL (DOM)
ENGINE:	OVRM120	22000F	01091BC0010
TRANSMISSION:	930	011	3071-7308
SHORT BLOCK:	SBV	2308	1198F

5 Engine/Transmission Short Block/Model No.	Spec No.	D.O.M. or Serial No.
OVRM120	22000F	01091BC0010
Equipment Manufacturer	**Type of Equipment**	**Engine Received**
LTD	Rotary Mower	☒ Mounted ☐ Detached

BOX 6 HOURS USED:
Provide the best estimate of the hours used.

6 HOURS USED		
	1	0

BOX 7 UNIT ORIGINALLY SOLD BY:
Enter the store name that sold the piece of equipment. If the equipment was sold by you or in your stock, then enter your company name.

7 UNIT ORIGINALLY SOLD BY
Town & Country Garden

BOX 8 DISPOSITION OF PARTS:
Select one of three choices: Returned to Factory, Returned to Central, or Retained and Tagged. Remember, keep all warranty parts until payment has been received.

8 PARTS HAVE BEEN		
☐ Returned to Factory	☐ Returned to Central	☒ Retained & Tagged

BOX 9 DEFECTIVE PART NUMBER:
Enter the part number that identifies the defective part which caused the failure. This part number can be found in Tecumseh's illustrated parts pages or microfiche cards.

EXAMPLE: A unit is returned because the carburetor is leaking. Upon examination it is found the needle/seat is not functioning properly. The defective part would be the part number for the needle/seat; not the complete carburetor.

9 DEFECTIVE PART NUMBER								
6	3	1	0	2	1			

BOX 10 FAILURE SUFFIX (DEFECT CODE):

After you have identified the defective part, choose the failure suffix that best describes the part's defect. In the example above, the failure suffix would be "NS" (not seating).

10 FAILURE SUFFIX	N	S

FAILURE SUFFIXES		
AW- Assembled Wrong	FM- Foreign Material	SD- Shipping Damage
BC- Broken/Cracked	IF- Improper Fit	SG- Scored/Galled
BL- Blown	LK- Leaked	SS- Stuck/Seized
BT- Bent/Twisted	MI- Missing	ST- Stripped
CD- Porous/Casting Deficiency	ML- Magnet Loose	UO- Unknown/Other
	NS- Not Seating	VC- Valve/Clearance
CL- Came Loose/Off	NY- Noisy	WN- Worn
CP- Corroded/Pitted	OA- Out of Adjustment	WP- Warped
EF- Electric Failure	PM- Part Made/ Machined Incorrectly	

BOX 11 CONDITION FOUND AND PROBABLE CAUSE OF FAILURE:

Briefly explain the conditions found or customer's description of defect. Words such as "defective" or "broken" are not sufficient.

11 Condition Found/Probable Cause of Failure (Word "Defective" Not Sufficient)
Gas leaking out from carb. intake - leaking needle and seat.

BOX 12 WORK PERFORMED:

Describe the steps involved to complete the repair. If it was necessary to remove and replace an engine or transmission to perform the repair, separate repair time from remove and replace time and enter them separately in box 14.

12 Job Number/Work Performed. If Necessary to Remove & Replace (R&R) Engine from Equipment, then Show R&R Separately.
Removed carb. from engine.
Replaced defective needle and seat assembly.

BOX 13 MISCELLANEOUS:

Enter the freight charges (if applicable) in dollars and cents.

NOTE: freight is only applicable on complete short blocks, engines, and Tecumseh/Peerless drive units. Freight will always be reimbursed at F.O.B. FACTORY.

13 Miscellaneous	Dollars	Cents
Freight/Postage Allowance Attach Freight Bill		

BOX 14 LABOR:

Enter the amount of labor required to perform the repair in hours and minutes. If removal and replacement of the engine/transmission was necessary to perform the repair, enter that time separate. Add the repair time and the remove and replace time (if applicable). Enter in the TOTAL section.

14 Labor	HRS.	MINS./TENTHS	JOB#
Repair 1			
Repair 2			
Repair 3			
Misc. Labor			
R & R		30	
TOTAL		30	

BOX 15 FACTORY USE ONLY

15 FACTORY USE ONLY	
OEM Code	
Defect Code #	
End Use Code #	
Division	

BOX 16 PART NUMBERS:

Enter part number, quantity, and description of the part(s) used in the repair.

16 Part Number	Qty.	Description
631021	1	Inlet needle, seat & clip
631028	1	O-ring
26756	1	Gasket

BOX 17 AUTHORIZATION SIGNATURE (REQUIRED FOR ENGINE/SHORT BLOCK/ TRANSMISSION):

Authorization signature **MUST** be obtained from your respective Central Warehouse Distributor, Authorized Service Distributor, Tecumseh Factory Representative or Authorized TMT at a premier dealership prior to claim submission for complete engine, short block, or transmission replacement.

17 Engine/Short Block/Transmission (Authorized Signature Req'd)
Authorized By:
Firm Name:

Europa News

The following issues regarding Bulletins or Policies apply to Europa only.

Service Bulletin 2002/11

TECUMSEH

Service Bulletin No. 2002/11
Issued: 01 April 2002
Revised:

Tecumseh Europa S.p.a.
Service

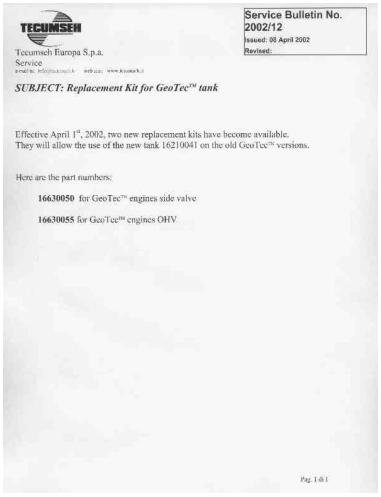
SUBJECT: STARTER REPAIR GAUGE – P/n # 88841066

The above-mentioned tool has been introduced to simplify the repair of the integrated starter and housing assembly when using the pulley repair kit, service part number 16630041.

This tool provides a support for the housing when re-installing the pin retainer and gauges the depth of the pin to a specific dimension to ensure the starter pawls function correctly.

The drawing below shows the position of the repair gauge to the housing assembly.

Service Bulletin 2002/12



TECUMSEH

Service Bulletin No. 2002/12
Issued: 08 April 2002
Revised:

Tecumseh Europa S.p.a.
Service

SUBJECT: Replacement Kit for GeoTec™ tank

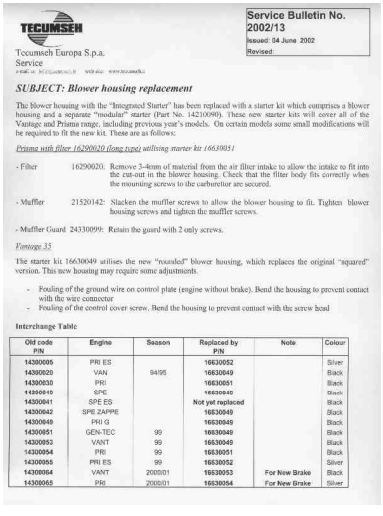
Effective April 1st, 2002, two new replacement kits have become available.
They will allow the use of the new tank 16210041 on the old GeoTec™ versions.

Here are the part numbers:

16630050 for GeoTec™ engines side valve

16630055 for GeoTec™ engines OHV

Service Bulletin 2002/13



TECUMSEH

Service Bulletin No. 2002/13
Issued: 04 June 2002
Revised:

Tecumseh Europa S.p.a.
Service

SUBJECT: Blower housing replacement

The blower housing with the "Integrated Starter" has been replaced with a starter kit which comprises a blower housing and a separate "modular" starter (Part No. 14210960). These new starter kits will cover all of the Vantage and Prisma range, including previous year's models. On certain models some small modifications will be required to fit the new kit. These are as follows:

Prisma with filter 16290020 (long type) utilising starter kit 16630051

- Filter 16290020: Remove 3-4mm of material from the air filter intake to allow the intake to fit into the cut-out in the blower housing. Check that the filter body fits correctly when the mounting screws to the carburetor are secured.
- Muffler 21520142: Slacken the muffler screws to allow the blower housing to fit. Tighten blower housing screws and tighten the muffler screws.
- Muffler Guard 24330099: Retain the guard with 2 only screws.

Vantage 35

The starter kit 16630049 utilises the new "rounded" blower housing, which replaces the original "squared" version. This new housing may require some adjustments.

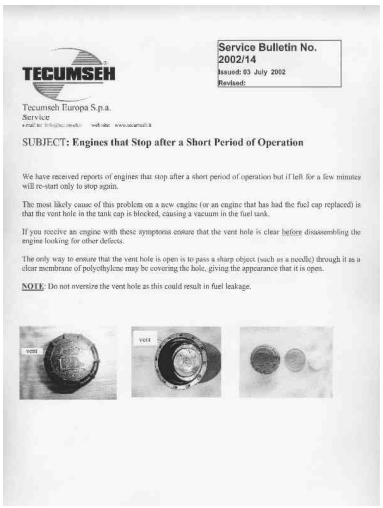
- Fouling of the ground wire on control plate (engine without brake). Bend the housing to prevent contact with the wire connector
- Fouling of the control cover screw. Bend the housing to prevent contact with the screw head

Interchange Table

Old code P/N	Engine	Season	Replaced by P/N	Note	Colour
14300005	PRI ES		16630052		Silver
14300020	VAN	94/95	16630049		Black
14300030	PRI		16630051		Black
14300040	SPE		16630040		Black
14300041	SPE ES		Not yet replaced		Black
14300042	SPE ZAPPE		16630049		Black
14300049	PRI G		16630049		Black
14300051	GEN-TEC	99	16630049		Black
14300052	VANT	99	16630049		Black
14300054	PRI	99	16630051		Black
14300055	PRI ES	99	16630052		Silver
14300064	VANT	2000/01	16630053	For New Brake	Black
14300065	PRI	2000/01	16630054	For New Brake	Silver

Europa News

Service Bulletin 2002/14



TECUMSEH

Tecumseh Europa S.p.a.
Service

Service Bulletin No. 2002/14
Issued: 03 July 2002
Revised:

SUBJECT: **Engines that Stop after a Short Period of Operation**

We have received reports of engines that stop after a short period of operation but if left for a few minutes will re-start only to stop again.

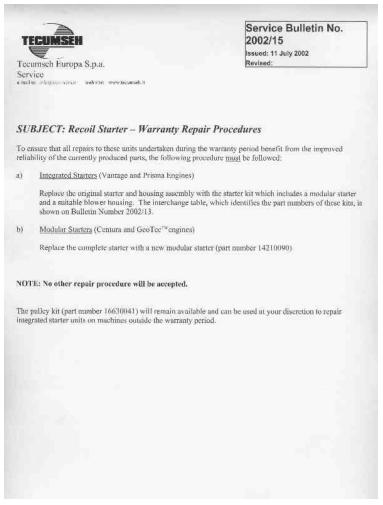
The most likely cause of this problem on a new engine (or an engine that has had the fuel cap replaced) is that the vent hole in the tank cap is blocked, causing a vacuum in the fuel tank.

If you receive an engine with these symptoms ensure that the vent hole is clear before disassembling the engine looking for other defects.

The only way to ensure that the vent hole is open is to pass a sharp object (such as a needle) through it as a clear membrane of polyethylene may be covering the hole, giving the appearance that it is open.

NOTE: Do not oversize the vent hole as this could result in fuel leakage.

Service Bulletin 2002/15



TECUMSEH

Tecumseh Europa S.p.a.
Service

Service Bulletin No. 2002/15
Issued: 11 July 2002
Revised:

SUBJECT: Recoil Starter – Warranty Repair Procedures

To ensure that all repairs to these units undertaken during the warranty period benefit from the improved reliability of the currently produced parts, the following procedure must be followed:

a) Integrated Starters (Vantage and Prisma Engines)

Replace the original starter and housing assembly with the starter kit which includes a modular starter and a suitable blower housing. The interchange table, which identifies the part numbers of these kits, is shown on Bulletin Number 2002/13.

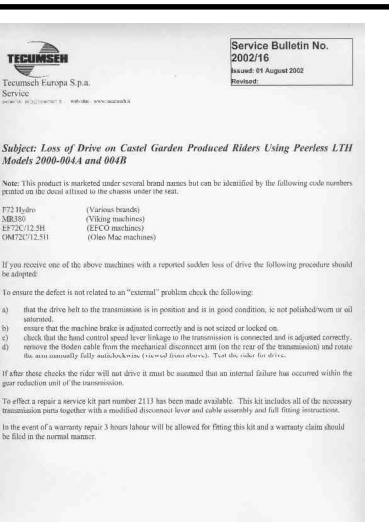
b) Modular Starters (Centura and GeoTec™ engines)

Replace the complete starter with a new modular starter (part number 14210090)

NOTE: No other repair procedure will be accepted.

The pulley kit (part number 16630041) will remain available and can be used at your discretion to repair integrated starter units on machines outside the warranty period.

Service Bulletin 2002/16



TECUMSEH

Tecumseh Europa S.p.a.
Service

Service Bulletin No. 2002/16
Issued: 01 August 2002
Revised:

Subject: Loss of Drive on Castel Garden Produced Riders Using Peerless LTH Models 2000-004A and 004B

Note: This product is marketed under several brand names but can be identified by the following code numbers printed on the decal affixed to the chassis under the seat.

T72 Hydro	(Various brands)
MR380	(Viking machines)
EF72C/12.5H	(EFCO machines)
OM72C/12.5H	(Oleo Mac machines)

If you receive one of the above machines with a reported sudden loss of drive the following procedure should be adopted:

To ensure the defect is not related to an "external" problem check the following:

a) that the drive belt to the transmission is in position and is in good condition, ie not polished/worn or oil saturated.
b) ensure that the machine brake is adjusted correctly and is not seized or locked on.
c) check that the hand control speed lever linkage to the transmission is connected and is adjusted correctly.
d) remove the Boden cable from the mechanical disconnect arm (on the rear of the transmission) and rotate the arm manually fully anticlockwise (viewed from above). Test the rider for drive.

If after these checks the rider will not drive it must be assumed that an internal failure has occurred within the gear reduction unit of the transmission.

To effect a repair a service kit part number 2113 has been made available. This kit includes all of the necessary transmission parts together with a modified disconnect lever and cable assembly and full fitting instructions.

In the event of a warranty repair 3 hours labour will be allowed for fitting this kit and a warranty claim should be filed in the normal manner.

Service Tool List and Order Form

Special Service, Diagnostic, Measurement & Repair Tools Description	Part Number	User Cost	Premier Dealer	Standard Dealer	Limited Dealer	On Hand	On Order
*Tool Kit	670195E		M	M	M		
Tachometer (Inductive or Vibratach)	670156 Vibratach or 670365 Inductive		M or R	M or R	M or R		
Ignition Tester	670366		M	M	M		
Multi Meter VOM & Temperature	670349		M	M	M		
Compression Tester	670358		M	M	M		
Outside Micrometers 0-1"	670350		M	R	R		
1-2:	670351		M	R	R		
2-3"	670352		M	R	R		
3-4:	670353		M	R	R		
Telescoping Gauge Set	670357		M	R	R		
Dial Indicator	670241		M	R	R		
Inspection Plate (Plate Glass) - Obtain Locally			R	R	R		
Feeler Gauge Set	670361		M	M	M		
Inch Pound Torque Wrench 0-600 inch lbs.	670363		M	M	M		
Valve Spring Compressor "C" Type	670362		M	M	M		
Piston Ring Compressor	670359		M	M	M		
Piston Ring Expander	670117		M	M	M		
**Valve Seat (Neway LG3000 Kit or comparable)	670347		M	M	M		
**Face Cutting Set (Neway 612 Gizmatic)	670348		R	R	R		
Cylinder Hone (Flex)	670360		M	M	M		
Starter Bendix Ring Tool	670346		M	R	R		
Crankcase Vacuum / Oil pressure adapter	670364A		M	R	R		
Hole Gauge Set	670356		M	M	M		
Oil Vacuum 110 Volt Pump only	670354		R	R	R		
Extreme Duty Oil Tank	670367		R	R	R		
Oil Vacuum Kit (Includes vac and tank)	670379		R	R	R		
Leak Test Kit - Complete	670340		R	R	R		
Leak Test Transaxle / Carburetor Adapter Kit	670345		R	R	R		
Dial Caliper, 6"	670368		R	R	R		
Valve Lash Tool	670387		M	M	M		
Battery Load Tester	670286		R	R	R		
LTH Alignment Tool	670384		M	M	M		

* See Tecumseh Form #694862 for Complete Tool Kit List

** Neway LG2000 or 102 kits can be upgraded by calling Neway direct: 1-800-248-3889

M = Mandatory Tools (Must have or place order)

R = Recommended Tools

NOTE: Prices subject to change
Equivalent tools may be used.

Dealer Name _____

Address _____

City, State, Zip _____

Phone _____

Account No. _____

TECUMSEH

SERVICE BULLETIN 128

INFORMATIONAL

ISSUED: December 2001
MODEL AFFECTED: OHSK70
SPECIFICATION NUMBER: 72523D
DOM's AFFECTED: 1221 THROUGH 1309

Simplicity Model : 755 Snowthrower
Simplicity Manufacturer Number: 1693983

We have identified a potential problem with the primer line routing on the above model engines.

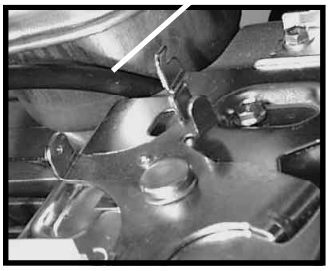
Photograph 1 shows the **INCORRECT** routing with the primer line pinched between the housing and muffler. If the engine is started with the line located in this position, the line will melt immediately on start-up causing the primer to no longer function, which results in hard starting.

There is **NO DANGER** of fuel leaking from the primer line should it melt as it uses air to prime the carburetor.

Prior to sale of any 2002 Simplicity model **1693983 755 snowthrower,** please inspect them for improper routing of the line as shown in photo 1. If the line is not properly located as shown in photo 2, use a blunt object or your hand to move the line to the correct location as shown. Also check that the line routing is behind and under the fuel line as shown.

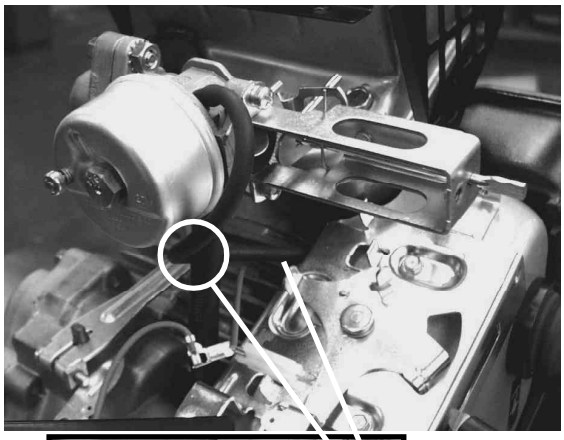
File a claim with Tecumseh using a completely filled out ESA–157 claim form for 15 minutes labor referencing this bulletin number. If the primer line was damaged order part number 32180C. If you are not a Tecumseh Servicing Dealer, submit warranty to Simplicity Manufacturing Inc.

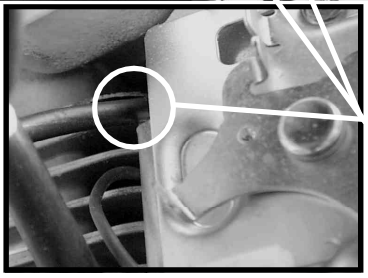
PHOTO 1



INCORRECT

PHOTO 2





CORRECT

SERVICE WARRANTY POLICY

LIMITED WARRANTY FOR NEW TECUMSEH ENGINES AND ELECTRONIC IGNITION MODULES

Revised October 2002

For the time period shown below from the date of purchase and subject to the exceptions and limitations described herein, Tecumseh Products Company will, at its option as the exclusive remedy, either repair or replace for the original purchaser, free of charge, any part of any new Tecumseh engine which is found, upon examination by any Tecumseh Authorized Service Outlet or by Tecumseh's factory in Grafton, Wisconsin, to be **DEFECTIVE IN MATERIAL AND/OR WORKMANSHIP**. This Limited Warranty **DOES NOT COVER** (i) any Tecumseh engine or part(s) thereof used to power any vehicle in competitive racing and/or used on any commercial or rental track, or (ii) defects or damage caused by alterations or modifications of new Tecumseh engines or parts or by normal wear, accidents, improper maintenance, improper use or abuse of the product, or failure to follow the instructions contained in an Instruction Manual for the operation of the new Tecumseh engine or part. The cost of normal maintenance or replacement of service items which are not defective shall be paid for by the original purchaser. At the time warranty service is requested, evidence must be presented of the date of purchase by the original purchaser. Any charge for making service calls and/or for transporting any engine or part(s) thereof to and from the place where the inspection and/or warranty work is performed is payable solely by the purchaser. The purchaser is responsible for any damage or loss incurred in connection with the transportation of any engine or part(s) thereof submitted for inspection and/or warranty work. **WARRANTY SERVICE CAN ONLY BE PERFORMED BY A TECUMSEH AUTHORIZED SERVICE OUTLET.** Warranty service can be arranged by contacting a Tecumseh Authorized Service Outlet (any Tecumseh Registered Service Dealer, Tecumseh Authorized Service Distributor, or Tecumseh Central Warehouse Distributor) or by contacting Tecumseh c/o Service Manager, Engine and Transmission Group Service Division, 900 North Street, Grafton, Wisconsin USA 53024-1499.

	"CONSUMER USE" [4]		"COMMERCIAL USE" [5]	
Warranty Category[6]	Within U.S.A. and Canada	Outside U.S.A. and Canada	Within U.S.A. and Canada	Outside U.S.A. and Canada
(A)	90 day	90 day[1]	No Warranty	No Warranty
(B)	1 Year	1 Year[1]	1 Year	1 Year
(C)	2 Years	1 Year[1]	1 Year	1 Year
(D)	2 Years	2 Years[2]	1 Year	1 Year
(E)	2 Years	2 Years	1 Year	1 Year
(H)	2 'n 10[3]	2 'n 10[3]	1 Year	1 Year
(K)	2 'n 10[3]	2 'n 10[3]	2 'n 10[3]	1 Year
(M)[7]	3 Years	3 Years	1 Year	1 Year

(1) 2 years for Member States of the European Union. Consumers may have additional legal rights not affected by the terms of this warranty pursuant to EU Directive 1999/44/EC and the national legislation of certain Member States of the European Union.

(2) 1 year for Australia/New Zealand for rotary mower engines.

(3) 2 years on engine and 10 years (first 5 years covering parts and labor only, the second 5 years covering parts only) on electronic ignition.

(4) For purposes of this warranty policy, "consumer use" shall mean consumer's personal, residential, household use by the original retail purchaser.

(5) For purposes of this warranty policy, "commercial use" shall mean all other uses, including use for commercial, income producing, or rental purposes.

(6) The engine warranty category of your engine can be determined by review of the engine model number on the "Important Engine Information" decal. One letter in the engine model number will be surrounded by parentheses (A), (B), (C), (D), (E), (H), (K) or (M) and that letter is your engine warranty category designation.

(7) Qualification for three (3) year consumer use warranty under engine warranty category (M) may be determined by notation of an (M) designation on the "Important Engine Information" decal located on the engine housing or on an addendum decal affixed adjacent thereto.

THIS EXPRESS WARRANTY IS SUPPLEMENTED BY THE TECUMSEH EMISSION CONTROL WARRANTY STATEMENT, if any.

PARTS, SHORT BLOCKS, OR SERVICE ENGINES WARRANTY PERIOD		
	"CUSTOMER PURCHASED"	"INSTALLED" UNDER WARRANTY
Parts	90 days[1]	Remainder of original warranty
Short Blocks	1 Year[1]	Remainder of original warranty
Service Engines	Normal warranty applies[1]	Remainder of original warranty

This limited warranty applies to repair and/or replacement of defective parts caused by faulty material or workmanship in manufacture. It does not apply to defects caused by negligence or normal wear.

THIS EXPRESS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES. Neither Tecumseh nor any of its affiliates makes any warranties, representations, or promises, written or oral, as to the quality of the engine or any of its parts, other than as set forth herein. **ANY IMPLIED WARRANTY OF MARKETABILITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT THAT EITHER MAY APPLY TO ANY TECUMSEH ENGINE OR PART(S) THEREOF, SHALL BE LIMITED IN DURATION TO THE PERIODS OF THE EXPRESS WARRANTIES SHOWN IN THE WARRANTY PERIOD CHART ABOVE AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. IN NO EVENT WILL TECUMSEH BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES AND/OR EXPENSES, INCLUDING, BUT NOT LIMITED TO, ANY LOSS OF TIME, INCONVENIENCE, LOSS OF UNIT USE OR ANY COST OR EXPENSE OF SUBSTITUTE UNITS DURING PERIODS OF MALFUNCTION OR NON-USE.** Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other legal rights which vary from state-to-state.

Tecumseh neither assumes nor authorizes any other person, natural or corporate, to assume for Tecumseh any other obligations or liabilities in connection with or with respect to any Tecumseh product or parts. The seller or dealer of a Tecumseh product or part has no authority, whatsoever, to make any representations or promises on behalf of Tecumseh or to modify the terms or limitations of Tecumseh's warranty in any way.

SERVICE WARRANTY POLICY

LIMITED WARRANTY FOR NEW TECUMSEH DRIVETRAIN (PEERLESS) PRODUCT OR PARTS

Issued January 1980
Revised October 2002

For the time periods shown below and subject to the exceptions and limitations described herein, from the date of purchase, Tecumseh Products Company will, at its option as the exclusive remedy, either repair or replace for the original purchaser, free of charge, any part of any new Tecumseh product, which is found, upon examination by any Tecumseh Authorized Service Outlet or by Tecumseh's Service Division in Grafton, Wisconsin, to be **DEFECTIVE IN MATERIAL AND/OR WORKMANSHIP**. This Limited Warranty **DOES NOT COVER** (i) any Tecumseh product or part(s) thereof used to power any vehicle in competitive racing, or (ii) defects or damage caused by alterations or modifications of new Tecumseh product or parts or by normal wear, accidents, improper maintenance, improper use or abuse of the product, or failure to follow the instructions contained in an Instruction Manual as supplied by either the Original Equipment Manufacturer or Tecumseh for the operation of the new Tecumseh product or part. The cost of normal maintenance or replacement of service items which are not defective shall be paid for by the original purchaser. At the time warranty service is requested, evidence must be presented of the date of purchase by the original purchaser. Any charge for making service calls and/or for transporting equipment or part(s) thereof to and from the place where the inspection and/or warranty work is performed is payable solely by the purchaser. The purchaser is responsible for any damage or loss incurred in connection with the transportation of any product or part(s) thereof submitted for inspection and/or warranty work. **WARRANTY SERVICE CAN ONLY BE PERFORMED BY A TECUMSEH AUTHORIZED SERVICE OUTLET.** Warranty service can be arranged by contacting a Tecumseh Authorized Service Outlet (any Tecumseh Registered Service Dealer, Tecumseh Authorized Service Distributor, or Tecumseh Central Warehouse Distributor) or by contacting Tecumseh c/o Service Manager, Engine and Transmission Group Service Division, 900 North Street, Grafton, Wisconsin USA 53024-1499.

	"CONSUMER USE" **		"COMMERCIAL USE"		"RENTAL USE"	
MODELS	Within U.S.A. and Canada	Outside U.S.A. and Canada[3]	Within U.S.A. and Canada	Outside U.S.A. and Canada	Within U.S.A. and Canada	Outside U.S.A. and Canada
300, 801, 820, 900, 910, 915, 920, 930, 940, 9000, 1100, 2600, LTH[1], MST200, VST205[1], VST705[1]	2 YEARS[4]	2 YEARS[4]	90 DAYS	90 DAYS	30 DAYS	30 DAYS
100, 700, 800, 1000, 1300, 1310, 1400, 2300, 2500, 2800, 9100, 9200	1 YEAR	2 YEARS	90 DAYS	90 DAYS	30 DAYS	30 DAYS

(1) Any Peerless® Series LTH, VST205 transaxle or VST705 transmission which is found upon examination by any Tecumseh Authorized Service Outlet or by Tecumseh's factory in Grafton, Wisconsin, to be DEFECTIVE IN MATERIAL AND/OR WORKMANSHIP, and if received by Tecumseh or a Tecumseh Authorized Service Outlet for such warranty examination within the applicable warranty period noted above is SUBJECT TO A REPLACEMENT EXCHANGE PROGRAM USING EITHER NEW OR REMANUFACTURED UNITS as determined by Tecumseh or the Tecumseh Authorized Service Outlet and furnished by Tecumseh. Remanufactured units and parts are subject to the limited warranty provisions described above and to the following warranty periods.
(2) For purposes of this limited warranty, "consumer use" shall mean consumer's personal, residential, household use by the original retail purchaser.
(3) Minimum 2 year consumer warranty for Member States of the European Union. Consumers may have additional legal rights not affected by the terms of this warranty pursuant to EU Directive 1999/44/EC and the national legislation of certain Member States of the European Union.
(4) Qualification for three (3) year consumer use warranty may be determined by notation of an (M) designation on the "Important Engine Information" decal located on the engine housing or on an addendum decal affixed adjacent thereto.

Tecumseh Remanufactured Units and Parts Warranty Period				
	"Consumer Use"[2]	"Commercial Use"	"Rental Use"	"Installed" Under Warranty
Remanufactured Unit	1 Year[3]	90 Days	30 Days	Remainder of original warranty
Parts	1 Year[3]	30 Days	30 Days	Remainder of original warranty

THIS EXPRESS WARRANTY IS IN LIEU OF ALL OTHER EXPRESS WARRANTIES. Neither Tecumseh nor any of its affiliates makes any warranties, representations, or promises, written or oral, as to the quality of the product(s) or any of its parts, other than as set forth herein. **ANY IMPLIED WARRANTY OF MARKETABILITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT THAT EITHER MAY APPLY TO ANY TECUMSEH PRODUCT OR PART(S) THEREOF, SHALL BE LIMITED IN DURATION TO THE PERIODS OF THE EXPRESS WARRANTIES SHOWN IN THE WARRANTY PERIOD CHART ABOVE AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. IN NO EVENT WILL TECUMSEH BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL AND/OR SPECIAL DAMAGES AND/OR EXPENSES INCLUDING, BUT NOT LIMITED TO, ANY LOSS OF TIME, INCONVENIENCE, LOSS OF UNIT USE OR ANY COST OR EXPENSE OF SUBSTITUTE UNITS DURING PERIODS OF MALFUNCTION OR NON-USE.** Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other legal rights which vary from state-to-state.

Tecumseh neither assumes nor authorizes any other person, natural or corporate, to assume for Tecumseh any other obligations or liabilities in connection with or with respect to any Tecumseh product or parts. The seller or dealer of a Tecumseh product or part has no authority, whatsoever, to make any representations or promises on behalf of Tecumseh or to modify the terms or limitations of Tecumseh's warranty in any way.

Tecumseh Europa S.p.a.
Service
e-mail to: info@tecumseh.it web site: www.tecumseh.it

Service Bulletin No. 2002/13
Issued: 04 June 2002
Revised:

SUBJECT: Blower housing replacement

The blower housing with the "Integrated Starter" has been replaced with a starter kit which comprises a blower housing and a separate "modular" starter (Part No. 14210090). These new starter kits will cover all of the Vantage and Prisma range, including previous year's models. On certain models some small modifications will be required to fit the new kit. These are as follows:

Prisma with filter 16290020 (long type) utilising starter kit 16630051

- Filter 16290020: Remove 3-4mm of material from the air filter intake to allow the intake to fit into the cut-out in the blower housing. Check that the filter body fits correctly when the mounting screws to the carburettor are secured.

- Muffler 21520142: Slacken the muffler screws to allow the blower housing to fit. Tighten blower housing screws and tighten the muffler screws.

- Muffler Guard 24330099: Retain the guard with 2 only screws.

Vantage 35

The starter kit 16630049 utilises the new "rounded" blower housing, which replaces the original "squared" version. This new housing may require some adjustments.

- Fouling of the ground wire on control plate (engine without brake). Bend the housing to prevent contact with the wire connector
- Fouling of the control cover screw. Bend the housing to prevent contact with the screw head

Interchange Table

Old code P/N	Engine	Season	Replaced by P/N	Note	Colour
14300005	PRI ES		**16630052**		Silver
14300020	VAN	94/95	**16630049**		Black
14300030	PRI		**16630051**		Black
14300040	SPE		**16630049**		Black
14300041	SPE ES		**Not yet replaced**		Black
14300042	SPE ZAPPE		**16630049**		Black
14300049	PRI G		**16630049**		Black
14300051	GEN-TEC	99	**16630049**		Black
14300053	VANT	99	**16630049**		Black
14300054	PRI	99	**16630051**		Black
14300055	PRI ES	99	**16630052**		Silver
14300064	VANT	2000/01	**16630053**	**For New Brake**	Black
14300065	PRI	2000/01	**16630054**	**For New Brake**	Silver

Tecumseh Europa S.p.a.
Service
e-mail to: info@tecumseh.it web site: www.tecumseh.it

Service Bulletin No. 2002/15
Issued: 11 July 2002
Revised:

SUBJECT: Recoil Starter – Warranty Repair Procedures

To ensure that all repairs to these units undertaken during the warranty period benefit from the improved reliability of the currently produced parts, the following procedure must be followed:

a) Integrated Starters (Vantage and Prisma Engines)

Replace the original starter and housing assembly with the starter kit which includes a modular starter and a suitable blower housing. The interchange table, which identifies the part numbers of these kits, is shown on Bulletin Number 2002/13.

b) Modular Starters (Centura and GeoTec™ engines)

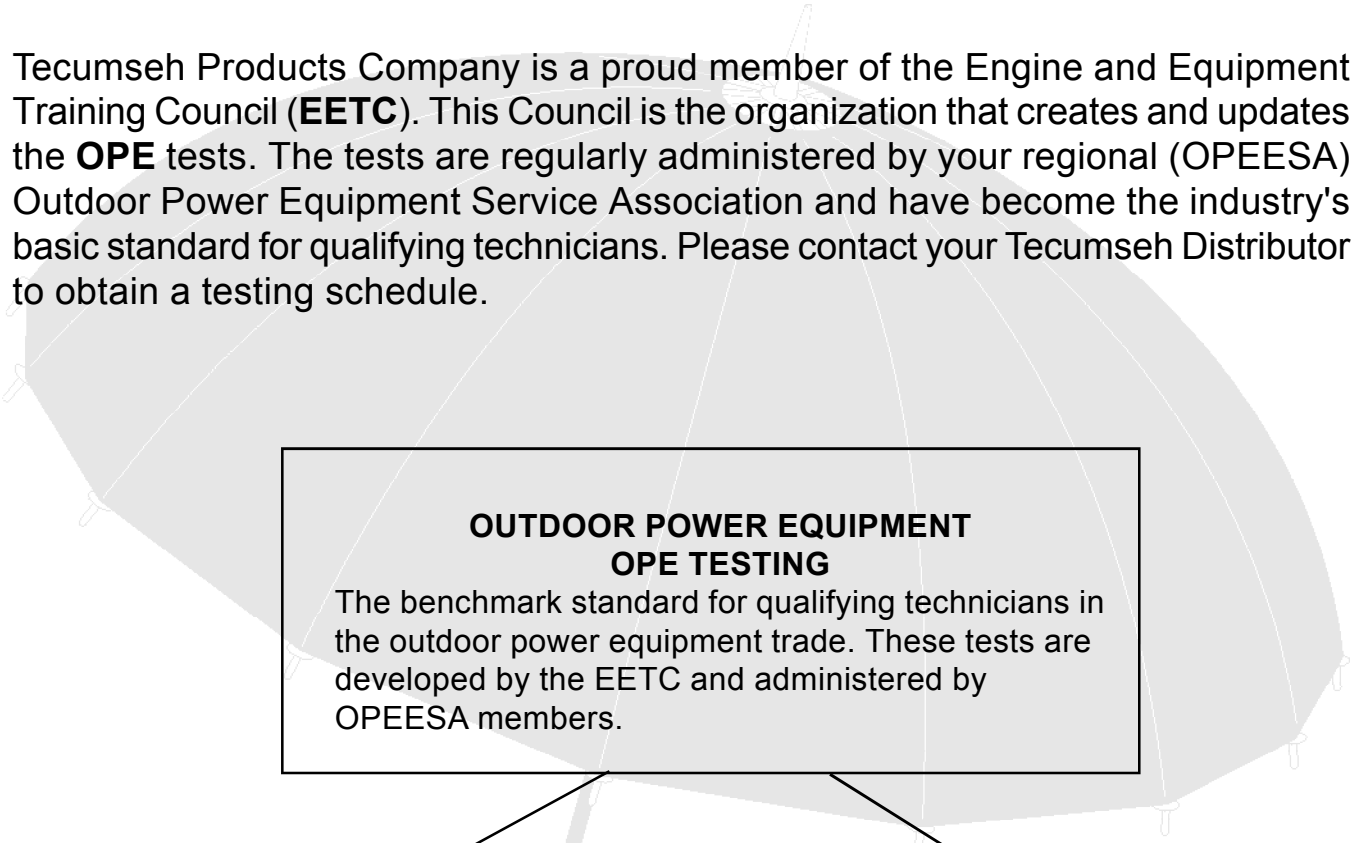
Replace the complete starter with a new modular starter (part number 14210090)

NOTE: No other repair procedure will be accepted.

The pulley kit (part number 16630041) will remain available and can be used at your discretion to repair integrated starter units on machines outside the warranty period.

The OPE Umbrella

Tecumseh Products Company is a proud member of the Engine and Equipment Training Council (**EETC**). This Council is the organization that creates and updates the **OPE** tests. The tests are regularly administered by your regional (OPEESA) Outdoor Power Equipment Service Association and have become the industry's basic standard for qualifying technicians. Please contact your Tecumseh Distributor to obtain a testing schedule.



OUTDOOR POWER EQUIPMENT
OPE TESTING
The benchmark standard for qualifying technicians in the outdoor power equipment trade. These tests are developed by the EETC and administered by OPEESA members.

EETC
Engine and Equipment Training Council

This professional organization is made up of outdoor power equipment manufacturers, dealers, distributors, service and training personnel, vocational and technical schools, national educational associations, and other interested industry and educational leaders. The council has established and promoted an industry sanctioned technician certification process for basic entry level certification.
The certification tests are regularly administered through regional OPEESA members.

OPEESA
Outdoor Power Equipment Service Association

The organization which administers OPE testing. They also developed and distribute the ESA-157 Warranty Service Claim form for the outdoor power equipment market.

Equipment & Engine Training Council

Yes, there is a shortage! Skilled service technicians in the power equipment industry are in short supply. At a recent industry meeting, one equipment manufacturer indicated that their dealers were short more than **3,500** technicians to service their products. It is conceivable that the real numbers for the whole industry may be many times higher. The U.S. Bureau of Labor indicates that **70% of jobs by the year 2005** will require **technically trained** professionals. So we've got to get going if we are to have the technicians we need for our future.

You certainly can't blame parents for wanting the best future for their children. However, we must take the lead in changing their perception of our industry. If the image of the service technician remains negative, then we have very little hope of developing a new generation of skilled service professionals.

We, as an industry, must take advantage of the growth in the service sector by educating parents and counselors in the benefits of becoming a professional service technician. Through our school accreditation program, technician certification, and student recruitment video we can make a difference.

This is where **Tecumseh dealers** come in. We need your help to insure that skilled professional service technicians are available to repair the power equipment products you sell. You can support the industry's efforts in insuring the availability of skilled technicians by becoming a member of EETC. Won't you please join other Tecumseh dealers who are already members in this worthwhile endeavor.

For more information call (262) 367-6700 or e-mail us at eetc@eetc.org

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Equipment & Engine Training Council
PO Box 648
Hartland, WI 53029
(262) 367-6700 · Fax (262) 367-9505

Tecumseh Dealer Membership: $50.00
Please make checks payable to Equipment & Engine Training Council

Name: _____ Title: _____

Company Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

E-mail: _____

2003 Update Seminar Technician Test

1. The new LEV90 has how many cc's?
   A. 127
   B. 172
   C. 148
   D. 90

2. All LEV pistons now have an arrow which will point towards the:
   A. valves
   B. flywheel
   C. mounting flange
   D. spark plug

3. The governor on the OHV180 has been given heavier flyweights for improved performance.
   A. TRUE B. FALSE

4. What change was made to the Series 7 carburetor?
   A. A larger main jet
   B. A red carburetor bowl
   C. A smaller venturi
   D. A larger venturi

5. All Service Engines are provided with electric starters if the original engine came with electric start.
   A. TRUE B. FALSE

6. Tecumseh's new 0W30 Synthetic Winter Oil provides ___ reduction in pull force over 5W30 at 0° Fahrenheit.
   A. 10%
   B. 25%
   C. 35%
   D. 50%

7. The new OHV180 has which of the following improvements:
   A. Matched intake ports
   B. Oil seal on the governor shaft
   C. High flow intake pipe
   D. Improved governor
   E. All of the above

8. When using a climate guard on an HM model of engine a muffler guard may not be used.
   A. TRUE B. FALSE

9. The OHM carburetor was changed to provide smooth running on RV applications by:
   A. Adding a dampening spring to the float
   B. Increasing the size of the bowl vent passage
   C. Adding another progression hole in the venturi
   D. Changing to a Series 11 carburetor

10. The flywheel nut on the OHH should be torqued to how many inch pounds?
    A. 250
    B. 350
    C. 450
    D. 550

11. A new fuel filter was designed to provide:
    A. better filtration for reformulated gasoline
    B. better flow for engines not equipped with fuel pumps
    C. better durability
    D. a replacement for the paper pleated filter

12. Which Tecumseh Technician's Handbook was recently revised to provide more tips and featured the 670377 tool?
    A. 4-cycle Overhead Valve Engines
    B. Tecumseh & Peerless Transmission and Drive Products
    C. 2-Cycle Engines
    D. Carburetor Identification, Troubleshooting and Service

13. The new valve lash tool is designed to aid in valve adjustments on which model(s) of engines?
    A. OHH
    B. LEV
    C. OVRM
    D. HM
    E. A & C

14. The Vent Tube Installer is used for reinstalling the vent tube on which carburetors?
    A. Emission
    B. Non-emission

15. A failed electric starter could be the result of:
    A. improper valve lash
    B. a faulty MCR
    C. a loose or broken magnet in the starter housing
    D. all the above

16. The speed limiting ignition for TC300 engines should have an air gap setting of .030".
    A. True
    B. False

17. What change was made to the inlet needle?
    A. The angle on the needle was changed
    B. The material was changed to a powdered metal
    C. The needle clip is thinner
    D. A seat is no longer needed

18. Walbro fuel pumps can be rebuilt while Tecumseh labeled fuel pumps cannot.
    A. True
    B. False

19. The head bolt bosses on LEV105 engines have been beefed up to:
    A. eliminate the need for a head gasket
    B. to maintain gasket clamping force
    C. to accommodate a new style of head bolts
    D. both A & C

20. The new VTX691 has had what changes made to the valve train
    A. Longer push rods
    B. Heavier valve springs
    C. Lighter intake valve
    D. New style rocker arms

21. The new Tecumseh Synthetic Blend 2-cycle oil will leave behind less carbon deposits than conventional 2-cycle oil.
    A. True
    B. False

22. A Tecumseh Snow King engine could be converted for use on a go-kart if an air cleaner assembly was added.
    A. True
    B. False

23. The 3-year warranty on Tecumseh engines will be designated by:
    A. a letter “M” on the engine ID label
    B. a supplemental decal placed alongside the engine ID label
    C. the equipment serial number
    D. either B or C

24. What change was made to the LEV120 electric start?
    A. A composite ring gear and pinion gear were added for a significantly quieter start
    B. A newly engineered starter providing higher starting RPMs
    C. A 220v electric starter
    D. Nothing, it is fine the way it is

25. How has the OHH engine been standardized?
    A. All of the blower housings will be standard red
    B. A self-cleaning air filter has been added
    C. The cylinders will all be a standard 195 cc
    D. All of the above

26. The benefits of the elliptical shaped piston on the OHM model engine include:
    A. Cooler running engine temperatures
    B. Less oil consumption
    C. Longer engine life
    E. Increased horsepower
    F. All the above

27. The engine shroud designed by MTD for Tecumseh engines is available through your Tecumseh Distributor.
    A. True
    B. False

28. The intake valve on all OHH/OHSK/OVRM engines was lightened to provide better durability in high speed applications.
    A. True
    B. False

29. We currently have how many videos available on our products?
    A. 2
    B. 4
    C. 6
    D. 8

30. The microfiche set #693030 covers engine from what years?
    A. prior to 1962
    B. 1962 to 1990
    C. 1990 to current
    D. This set only covers the Peerless product

31. The VTX691 has a new camshaft featuring:
    A. a “BCR” or bump compression release
    B. higher cam lobes to provide more lift
    C. a composite cam gear for quieter running
    D. All of the above

32. Which of the following is not a feature of the new LEV105 utility engine:
    A. Aluminum flywheel
    B. Series 1 carburetor with choke
    C. Fixed speed
    D. High performance piston

33. The new oil filter adapter for OHV model engines:
    A. Raises the oil filter for better clearance
    B. Provides higher oil pressure
    C. Requires the use a new oil filter
    D. Is manufactured from plastic for better cooling

34. The flywheel key for OHH/OHSK engines is now manufactured from:
    A. copper
    B. bronze
    C. powdered metal
    D. gold

35. When fastening a recoil starter handle to the rope its best to use what kind of knot.
    A. Fisherman’s knot
    B. Windsor knot
    C. Over-under knot
    D. Double left handed knot

36. When installing a new governor link on an engine one should:
    A. check the valve lash
    B. turn the engine over to top dead center on the compression stroke
    C. replace the air cleaner as well
    D. perform a static governor adjustment

37. How was the mounting flange gasket for the LEV120 changed?
    A. The material was changed to better withstand heat
    B. The gasket was made thicker
    C. A bead of silicon was added to the gasket
    D. A mounting flange gasket is no longer needed

38. The new 2-cycle snow engine, model HSK870, will be what horsepower?
    A. 2
    B. 5
    C. 7
    D. 8

39. The TMT Study Guide is fully comprehensive and is all a technician will need to study for the TMT Test.
    A. True
    B. False

40. If stored in a cool, dark place gasoline will stay fresh for up to 6 months.
    A. True
    B. False

41. When an engine fails because the proper oil level is not maintained:
    A. The cylinder will not show damage because it does not require lubrication
    B. The crankshaft journal will show aluminum transfer
    C. The flywheel end bearing will not show damage because it does not bear a load
    D. All the above

42. Under a no oil start situation there will always be signs of damage to multiple bearing surfaces.
    A. True
    B. False

43. When a transmission is shifted without the use of the clutch what will occur?
    A. Chipped shift keys
    B. Broken shift fork
    C. Damaged shift washers
    D. All the above

44. Broken gears in a transmission should be considered warranty.
    A. True
    B. False

45. When a connecting rod breaks due to the engine overspeeding, the break will typically be:
    A. down at the crankpin journal
    B. higher on the beam, near the piston pin
    C. right at the piston pin
    C. The connecting rod will not break because of overspeeding

46. At what point in the life of the engine will the head gasket begin to stick?
    A. 20 minutes
    B. 2 hours
    C. 5 hours
    D. 10 hours

47. All Tecumseh 2-cycle engines require a fuel/oil mixture of 32:1.
    A. True
    B. False

48. To help retain needle bearings in a Peerless transmission they should be packed in Bentonite grease.
    A. True
    B. False

49. When an engine fails due to overheating which of the following will not be present:
    A. The oil will be caramelized
    B. The governor gear will be heavily darkened
    C. A blown head gasket
    D. All of the above could be present

50. If an engine fails due to a loose rod bolt aluminum transfer will be present on the crankpin journal.
    A. True
    B. False

Notes

Notes

Notes

TECUMSEH FACTORY TRAINING APPLICATION

Please Print

Dealership Name _____ Phone No. _____ Code No. _____

Address _____ City _____ State _____ Zip _____

Student's Name _____ Student's Signature _____

Employer's Name _____ Employer's Signature _____

Student's E-mail _____ Employer's E-mail _____

4-DAY 2003 SCHOOL SCHEDULE - Factory Facilities

Grafton, Wisconsin Date	Douglas, Georgia Date
Dec. 1-6, 2002	**Jan. 12-17,** 2003
March 9-14, **2003**	**Feb. 9-14, 2003**
April 6-11, 2003	
Nov. 9-14, 2003	
Dec. 7-12, 2003	

2003 TEACHER'S SCHOOL

Grafton, Wisconsin
Date
June 22-27, 2003
July 13-18, 2003

FACTORY CERTIFIED TRAINING ☐ Application to attend

TEACHER'S SCHOOL ☐ Application to attend

Master Technician Testing will only be offered for pre-registered applicants with proof of holding EETC 4-Cycle certification.

Master Technician Test ☐ I would like to take the Master Technician Test at the reduced cost of $45.00.

School Dates: 1st choice _____ 2nd choice _____

Please check *all* that apply

- ☐ Single Accommodations **$475.00**
- ☐ Double Accommodations **$350.00**
- ☐ Tuition Only **$200.00**
- ☐ Tecumseh Master Technician Test **$45.00**

- ☐ Smoker
- ☐ Non-Smoker
- ☐ No Room Needed

To make payment using a credit card, please fill out the following information:

(Check One)
☐ Master Charge ☐ Visa ☐ Discover

Print Name (as it appears on card): _____

Account Number: _____

_____
Signature of Card Holder

Exp. Date: _____ Phone Number: _____

For registration information call the Education Department: 262-377-2700 or fax your application: 262-376-8238.
The Tecumseh Support Network Distributors in your area may hold in-house Factory Certified Training.
Please contact them for further information.

FOUR-DAY TECHNICIAN EDUCATION PROGRAM

Tecumseh, along with our distributor education team, has developed a factory level school program engineered to meet the needs of today's dealers and the technicians they employ.
This extensive hands-on program is now available in the USA and Canada through your regional Tecumseh Central Warehouse Distributor. The following program outline is a sample of what you can expect from these classes.

At the end of the four-day session, testing will be offered in both the Equipment and Engine Training Council (EETC) and Tecumseh Master Technician (TMT) certifications. Ask your Tecumseh sales person about the special benefits that are a part of being TMT certified. All certifications stay with the technician and dependent on your level of proficiency should increase your value to the dealership.

Day One • Information Retrieval Systems Computer, Microfiche and Paper • 2-Cycle Engine Theory and hands on covering TC, HSK and AV engine lines	**Day Three** • Enduro TVT Teardown/Reassembly • Fuel Systems, New Emissions • Carburetors • Electrical/Charging Systems
Day Two • 4-Cycle Overview: L-Head and Overhead Valve • LEV Teardown/Reassembly • OHH Enduro Teardown/Rebuild and Running Adjustments	**Day Four** • Failure Analysis • Warranty Procedures • Transaxle Teardown/Reassembly MST, 800 and 900 Series • LTH Overview

Located on the back cover page we have listed all of the training directors from your regional distributors. These Team Tecumseh educators can supply you with a complete list of classes available to you.

Please contact them directly.

Tecumseh Factory Educational Facilities

BILLIOU'S INC.
1343 S. Main
Porterville, CA 93257
Phone No. 559-784-4102
Fax No. 559-781-1875
Web Site: www.billious.com
EDUCATION DIRECTOR: RICK GROVES

CENTRAL POWER DISTRIBUTORS
1101 McKinley St.
Anoka, MN 55303
Phone No. 763-576-0901
Fax No. 763-576-0920
Web Site: www.cpdonline.com
EDUCATION DIRECTOR: BILL TORGERUD

CPD-OH
8181 Washington Church Rd.
Dayton, OH 45458
Phone No. 763-576-0901
Fax No. 763-576-0920
Web Site: www.cpdonline.com
EDUCATION DIRECTOR: BILL TORGERUD

CENTRAL POWER DISTRIBUTORS
N90W14635 Commerce Dr.
Menomonee Falls, WI 53051-2336
Phone No. 763-576-0901
Fax No. 763-576-0920
Web Site: www.cpdonline.com
EDUCATION DIRECTOR: BILL TORGERUD

W.J. CONNELL CO.
65 Green St.
Foxboro, MA 02035
Phone No. 508-543-3600
Fax No. 508-543-8394
Web Site: www.wjconnell.com
EDUCATION DIRECTOR: ROY MANRING

ENGINES SOUTHWEST
1255 N. Hearne
P.O. Box 67 (Zip Code 71161-0067)
Shreveport, LA 71107-7108
Phone No. 318-222-3871
Fax No. 318-425-4638
Web Site: www.enginessw.com
EDUCATION DIRECTOR: BRYAN CLARK

MEDART - KANSAS CITY
2644 S. 96th Street
Edwardsville, KS 66111-3483
Phone No. 636-282-2300
Fax No. 800-695-9530
Web Site: www.medartengine.com
EDUCATION DIRECTOR: GARY FIEBIG & BRIAN JONES

MEDART - ST. LOUIS
124 Manufacturers Drive
Arnold, MO 63010-4727
Phone No. 636-282-2300
Fax No. 800-695-9530
Web Site: www.medartengine.com
EDUCATION DIRECTOR: GARY FIEBIG & BRIAN JONES

POWER EQUIPMENT SYSTEMS
1645 Salem Industrial Dr., NE
PO Box 669 (Zip Code 97308)
Salem, OR 97303
Phone No. 503-585-6120
Fax No. 800-637-9243
Web Site: www.pesnet.com
EDUCATION DIRECTOR: DAN KUYKENDALL

SMITH ENGINES INC.
1601 Crossbeam Dr.
P.O. Box 668985
Charlotte, NC 28266-8985
Phone No. 704-392-3100
Fax No. 704-392-5208
Web Site: www.smithengines.com
EDUCATION DIRECTOR: HARRY WILLIAMS

SMITH ENGINES INC.
2303 Premier Row
Orlando, FL 32809
Phone No. 888-699-4288
Fax No. 407-855-4736
Web Site: www.smithengines.com
EDUCATION DIRECTOR: NICK DANN

SMITH ENGINES INC.
1665 Lakes Parkway Suite 116
Lawrenceville, GA 30043
Phone No. 770-237-0707
Fax No. 770-237-0210
Web Site: www.smithengines.com
EDUCATION DIRECTOR: HARRY WILLIAMS

TECUMSEH PRODUCTS COMPANY
900 North Street
Grafton, WI 53024
Phone No. 262-377-2700
Fax No. 262-377-4485
Web Site: www.TecumsehPower.com
CONTACT: PAUL BECHWAR

TECUMSEH DOUGLAS FACILITY
Tecumseh Products Company
1545 Kellog Drive
Douglas, GA 31535
Phone No. 262-377-2700
Fax No. 262-377-4485
Web Site: www.TecumsehPower.com
CONTACT: PAUL BECHWAR

CPT CANADA POWER TECH. LTD.
161 Watline Ave.
Mississauga, ON L4Z 1P2
Phone No. 905-890-6900
Fax No. 905-890-0147
Web Site: www.canadapowertech.com
EDUCATION DIRECTOR: ROBERT BARTON

CPT CANADA POWER TECH. LTD.
#101 - 10411 178 Street
Edmonton, AB T5S 1R5
Phone No. 780-453-5791
Fax No. 780-454-8377
Web Site: www.canadapowertech.com
EDUCATION DIRECTOR: VAGN ERIKSEN

CPT CANADA POWER TECH. LTD.
MONTREAL BRANCH
226 Rue Migneron
St. Laurent, PQ H4T 1Y7
Phone No. 514-731-3559
Fax No. 514-731-0064
Web Site: www.canadapowertech.com
EDUCATION DIRECTOR: MICHEL BOISVERT