

TECUMSEH POWER

Basic Troubleshooting and Service Information

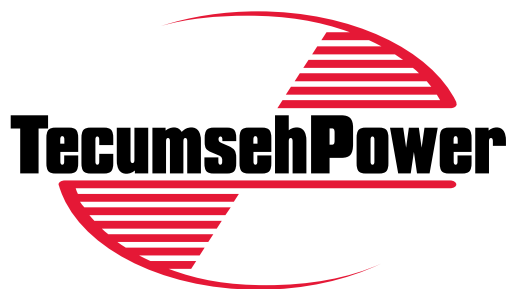


TABLE OF CONTENTS

Safety Definitions	ii
General Safety Precautions	1
General Information.....	2
Reviewing The Engine ID Label	3
Model Numbering Identification for TecumsehPower's Full Engine Line	4
Spark Plug Replacement (4-Cycle)	5
Spark Plug Replacement (2-Cycle and Europa)	6
Fuel Recommendations	7-8
TecumsehPower 4-Cycle Lubrication Requirements.....	9
4-Cycle Troubleshooting.....	10-11
TecumsehPower 2-Cycle Engine Oil Requirements.....	12
2-Cycle Troubleshooting.....	13-14
4-Cycle Cross Reference for Specification-To-Model Number Designation (Vertical Engines).....	15
4-Cycle Cross Reference for Specification-To-Model Number Designation (Horizontal Engines)	16
2-Cycle Cross Reference for Specification-To-Model Number Designation (Vertical and Horizontal Engines)	16
Repair Manuals	17

The information in this guide is intended to assist individuals who are knowledgeable in basic engine repair and maintenance. If you are unfamiliar with two and four cycle engine operation and maintenance, DO NOT attempt any maintenance or repairs. Contact your local TecumsehPower Servicing Dealer for assistance.

IMPORTANT NOTICE!

Safety Definitions

Statements in this manual preceded by the following words and graphics are of special significance:



Or



WARNING indicates a potentially hazardous situation which if not avoided, could result in death or serious injury.

NOTE

Refers to important information and is placed in italic type.

It is recommended that you take special notice of all items discussed on the next two pages and wear the appropriate safety equipment.

Before operating an engine *it is your responsibility* to read the Operator's Manual. Follow these basic rules for your personal safety:

- Keep this manual handy at all times for future reference.
- Read it carefully and familiarize yourself with operating, maintenance, components and safety instructions.

Notice Regarding Emissions

Engines which are certified to comply with California and U.S. EPA emission regulations for SORE (Small Off Road Equipment), are certified to operate on regular unleaded gasoline, and may include the following emission control systems: (EM) Engine Modification and (TWC) Three-Way Catalyst (if so equipped).

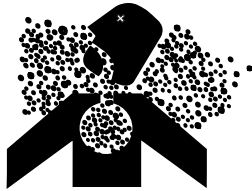
TecumsehPower Contact Information

For engine adjustments, repairs or warranty service, contact your nearest Authorized TecumsehPower Servicing Dealer. Find them on our website at www.TecumsehPower.com or call TecumsehPower at 1-800-558-5402 or 262-377-2700 if you are located outside the U.S.

General Safety Precautions

A. Avoid Carbon Monoxide Poisoning

All engine exhaust contains carbon monoxide, a deadly gas. Breathing carbon monoxide can cause headaches, dizziness, drowsiness, nausea, confusion and eventually death.



Carbon monoxide is a colorless, odorless, tasteless gas which may be present even if you do not see or smell any engine exhaust. Deadly levels of carbon monoxide can collect rapidly and you can quickly be overcome and unable to save yourself. Also, deadly levels of carbon monoxide can linger for hours or days in enclosed or poorly-ventilated areas. If you experience any symptoms of carbon monoxide poisoning, leave the area immediately, get fresh air, and **SEEK MEDICAL TREATMENT**.

To prevent serious injury or death from carbon monoxide:

- NEVER run engine indoors. Even if you try to ventilate engine exhaust with fans or open windows and doors, carbon monoxide can rapidly reach dangerous levels.
- NEVER run engine in poorly-ventilated or partially enclosed areas such as barns, garages, basements, carports, under dwellings, or in pits.
- NEVER run engine outdoors where engine exhaust can be drawn into a building through openings such as windows and doors.

B. Avoid Gasoline Fires

Gasoline (fuel) vapors are highly flammable and can explode. Fuel vapors can spread and be ignited by a spark or flame many feet away from engine. To prevent injury or death from fuel fires, follow these instructions:



- NEVER store engine with fuel in fuel tank inside a building with potential sources of ignition such as hot water and space heaters, clothes dryers, electric motors, etc.
- NEVER remove fuel cap or add fuel when engine is running.
- NEVER start or operate the engine with fuel fill cap removed.
- Allow engine to cool before refueling.
- NEVER fill fuel tank indoors. Fill fuel tank outdoors in a well-ventilated area.
- DO NOT smoke while refueling tank.
- Use only an approved red GASOLINE container

to store and dispense fuel. TecumsehPower recommends purchasing gasoline in containers with a capacity of 2.5 gallons or less. Small containers are easier to handle and help eliminate spillage during refueling.

- DO NOT pour fuel from engine or siphon fuel by mouth.

C. Adult Supervision of Operation, Refueling and Maintenance

Not everyone who is allowed to use an engine is capable of safely and responsibly operating, maintaining and/or fueling it. TecumsehPower recommends the following:

- An adult should fuel the engine. NEVER allow children to refuel an engine.
- An adult should perform maintenance on an engine. Only allow children to perform maintenance if an adult has determined they are experienced and capable of such operation.
- An adult should start the engine. Only allow children to start the engine if an adult has determined they are experienced and capable of such operation.

To avoid unsupervised operation of the engine, especially by children, NEVER leave it unattended when it is running.

D. Stay Away from Rotating Parts

NEVER operate an engine with an unguarded engine shaft.

The equipment manufacturer may attach a sprocket and chain or pulley and belt to the engine shaft. If these parts are not properly guarded, or if you are not sure whether they are properly guarded, DO NOT use your engine; contact the equipment manufacturer. Hands, feet, hair, jewelry, clothing, etc. can become entangled in rotating parts, leading to serious injury or death. To avoid serious injury or death, be sure the flywheel guard is in place.



General Information

The following information is being provided to assist you in locating and recording your engine model and specification numbers. This information will be needed to use this book or obtain parts from a local TecumsehPower dealer.

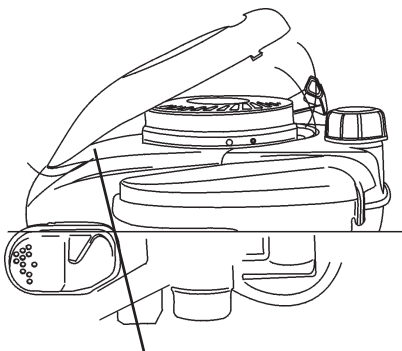
Model Numbering System for TecumsehPower's Full Engine Line Prior to 2004 Production

LOCATING AND READING ENGINE MODEL AND SPECIFICATION
THE FOLLOWING WILL BE NEEDED TO LOCATE PARTS FOR YOUR ENGINE.

	Model	Specification	(DOM)
ENGINE:	TVM195	150288G	8150C

ENGINE MODEL	SPEC NO.	D.O.M
TVM195	150288G	8150C

Typical Engine I.D. Label



ENGINE MODEL NUMBER LOCATED UNDER COVER


IMPORTANT ENGINE INFORMATION

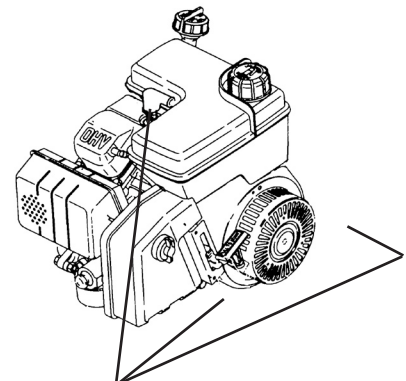
Tecumseh Power Company

THIS ENGINE MEETS 1995-1998 CALIF/US EPA PH1 APPLICABLE EMISSION REGULATIONS FOR ULGE ENGINES FUEL REGULAR UNLEADED OIL SAE 30

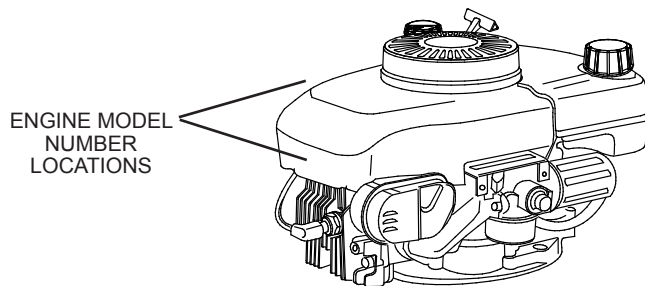
ENGINE MODEL	TVM195 150288G	(E)
ENGINE FAMILY	STP318U1G2EA	
DISPLACEMENT	318	D.O.M. 8150 C (S E R)

CAUTION FOR PERSONAL PROTECTION REFER TO OWNER'S MANUAL FOR IMPORTANT SAFETY AND MAINTENANCE INFORMATION





ENGINE MODEL NUMBER LOCATIONS



ENGINE MODEL NUMBER LOCATIONS

Model Numbering System for Current TecumsehPower's Full Engine Line

Reviewing The Engine ID Label

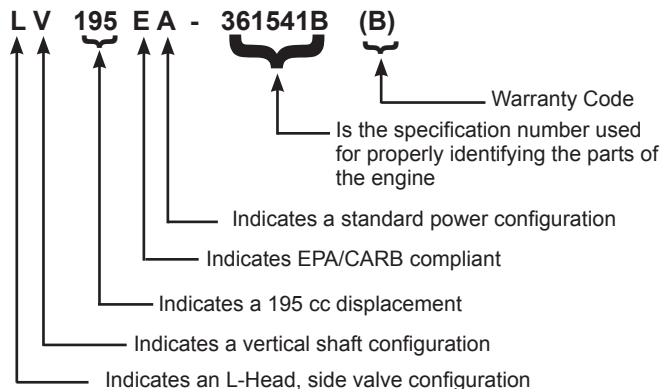
Effective with the 2004 Model Year, we have changes to the engine I.D. label on our products. The following pages will explain the information contained on the label dependent on the age of your product.

Specification Number

The numbers following the model number make up the specification number.

Using model **LV195EA-361541B**, as an example, interpretation is as follows:

LV195EA-361541B is the model and specification number.

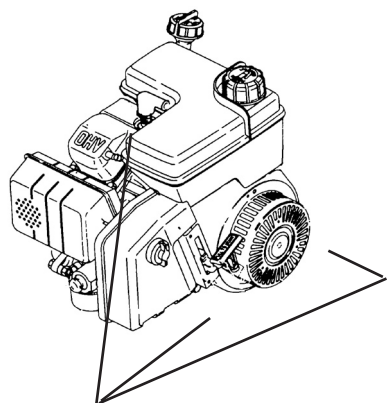


Date of Manufacture

The Date of Manufacture (D.O.M.) indicates the production date.

For this example, **03188BC0010** is the D.O.M. (Date of Manufacture).

Year	Day of Year	Mfg Facility	Assembly Line / Shift	Individual Serial #
2003	188th	B	C	10th unit built
03	188	B	C	0010



ENGINE MODEL NUMBER LOCATIONS

⚠ WARNING
2083

To avoid injury or death, read the engine operator's manual and the equipment owner's manual. Call 1(800)558-5402 for engine owner's manual.

--- IMPORTANT ENGINE INFORMATION ---

TECUMSEH POWER COMPANY

THIS ENGINE MEETS 1995-2005 CALIF & US EPA PHI APPLICABLE EMISSION REGULATIONS FOR SI SORE ENGINES EM

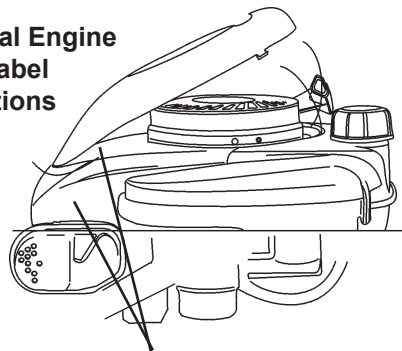
FUEL: REGULAR UNLEADED OIL: SAE 30

MODEL: LV195EA **WARRANTY:** (B)

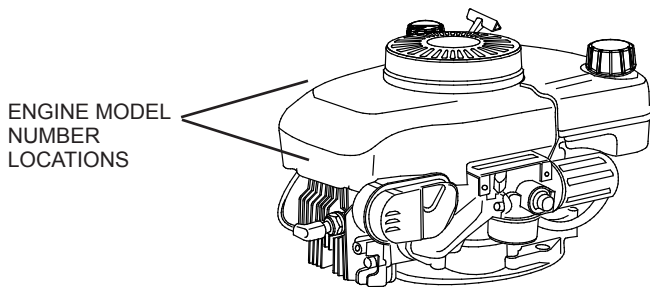
SPEC: 361541B **DOM:** 03188BC0010

ENGINE FAMILY: 2TPXS.1951BC DISP: 195 cc

Typical Engine I.D. Label Locations



ENGINE MODEL NUMBER LOCATED UNDER COVER



ENGINE MODEL NUMBER LOCATIONS

Model Numbering Identification for TecumsehPower's Full Engine Line

CURRENT CODE <i>(effective 2004 production)</i>
1st Space - Valve Orientation
T = Two Cycle
O = Overhead Valve
L = L-Head
2nd Space - Crank Orientation
V = Vertical
H = Horizontal
M = Multi-position
3rd, 4th and 5th Space - Displacement
6th Space - Emissions Class
E = 50 State/Global Emissions Compliant
X = Not for sale in California, except exempt applications
S = Snow Emission Compliant
7th Space - Engine Specifics
A = Standard (OHH50-60), (OHSK50-70)
P = Power Up (OHH65-70, OHSK75-775)

Prior to 2004 Model Number Conversion Chart																		
4-Cycle																		
<table> <tr> <td>LEV90 - LV148EA</td> <td>OHH60 - OH195EA</td> </tr> <tr> <td>LEV120 - LV195EA</td> <td>OHH65 - OH195EP</td> </tr> <tr> <td>HSSK50 - LH195SA</td> <td>OHSK70 - OH195SA</td> </tr> <tr> <td>HSSK55 - LH195SP</td> <td>OHSK75 - OH195SP</td> </tr> <tr> <td>VSK90 - LV148SA</td> <td>HMSK90 - LH318SA</td> </tr> <tr> <td>OHV135 - OV358EA</td> <td>HMSK110 - LH358SA</td> </tr> <tr> <td>OHV180 - OV490EA</td> <td>OHSK110 - OH318SA</td> </tr> <tr> <td>TVT691 - OV691EA</td> <td>OHSK130 - OH358SA</td> </tr> <tr> <td>VTX691 - OV691EP</td> <td>OHM110 - OH318EA</td> </tr> </table>	LEV90 - LV148EA	OHH60 - OH195EA	LEV120 - LV195EA	OHH65 - OH195EP	HSSK50 - LH195SA	OHSK70 - OH195SA	HSSK55 - LH195SP	OHSK75 - OH195SP	VSK90 - LV148SA	HMSK90 - LH318SA	OHV135 - OV358EA	HMSK110 - LH358SA	OHV180 - OV490EA	OHSK110 - OH318SA	TVT691 - OV691EA	OHSK130 - OH358SA	VTX691 - OV691EP	OHM110 - OH318EA
LEV90 - LV148EA	OHH60 - OH195EA																	
LEV120 - LV195EA	OHH65 - OH195EP																	
HSSK50 - LH195SA	OHSK70 - OH195SA																	
HSSK55 - LH195SP	OHSK75 - OH195SP																	
VSK90 - LV148SA	HMSK90 - LH318SA																	
OHV135 - OV358EA	HMSK110 - LH358SA																	
OHV180 - OV490EA	OHSK110 - OH318SA																	
TVT691 - OV691EA	OHSK130 - OH358SA																	
VTX691 - OV691EP	OHM110 - OH318EA																	
2-Cycle																		
<table> <tr> <td>TC300 - TM049XA</td> </tr> <tr> <td>HSK870 - TH139SP</td> </tr> <tr> <td>HSK600 - TH098SA</td> </tr> <tr> <td>AV520 - TV085XA</td> </tr> </table>	TC300 - TM049XA	HSK870 - TH139SP	HSK600 - TH098SA	AV520 - TV085XA														
TC300 - TM049XA																		
HSK870 - TH139SP																		
HSK600 - TH098SA																		
AV520 - TV085XA																		

4-Cycle

ECH -	Exclusive Craftsman Horizontal
ECV -	Exclusive Craftsman Vertical
H -	Horizontal Shaft
HH -	Horizontal Heavy Duty (Cast Iron)
HHM -	Horizontal Heavy Duty (Cast Iron) (Medium Frame)
HM -	Horizontal Medium Frame
HMSK -	Horizontal Medium Frame (Snow King)
HMXL -	Horizontal Medium Frame (Extra Life)
HS -	Horizontal Small Frame
HSSK -	Horizontal Small Frame (Snow King)
HXL -	Horizontal (Extra Life)
LAV -	Lightweight Aluminum Frame Vertical
LEV -	Low Emissions Vertical
LH -	L-Head Horizontal
LV -	L-Head Vertical
OH -	Overhead Valve Heavy Duty (Cast Iron)
OHH -	Overhead Valve Horizontal
OH195 -	Overhead Valve Horizontal (195 cc's)
OHM -	Overhead Valve Heavy Duty Horizontal (Medium Frame)
OHSK -	Overhead Valve Horizontal (Snow King)
OHV -	Overhead Valve Vertical (Medium Frame)
OV -	Overhead Valve Vertical
OVM -	Overhead Valve Vertical (Medium Frame)

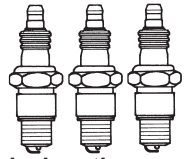
OVRM -	Overhead Valve Vertical (Small Frame) (Rotary Mower)
OVXL -	Overhead Valve Vertical (Medium Frame) (Extra Life)
TNT -	Toro 'N' TecumsehPower (Toro Exclusive Series)
TVEM -	TecumsehPower Vertical European Model
TVM -	TecumsehPower Vertical (Medium Frame) (Replaces V & VM)
TVS -	TecumsehPower Vertical Styled
TVT -	TecumsehPower Vertical Twin
TVXL -	TecumsehPower Vertical (Extra Life)
V -	Vertical Shaft
VH -	Vertical Heavy Duty (Cast Iron)
VLV -	Vector Lightweight Vertical
VLXL -	Vector Lightweight Vertical (Extra Life)
VM -	Vertical Shaft (Medium Frame)
VSK -	Vertical Snow King
VTX -	Vertical Twin

2-Cycle

TH -	Two Cycle Horizontal Shaft
TM -	Two Cycle Multiposition Operation
TV -	Two Cycle Vertical Shaft



Spark Plug Replacement



NOTE: Only models which will continue to be manufactured long term will have an updated Model designation.

4-CYCLE SPARK PLUG

Service Number 35395

RJ19LM

ECV100-120
 HMSK70, LH318SA (HMSK80), HMSK90
 HSK30-70
 HSSK40, LH195SA (HSSK50), LH195SP (HSSK55)
 LH358SA (HMSK100), HMSK110
 LEV80, LV148EA (LEV90), LV195EA (LEV120)
 LV148SA (VSK90), VSK100
 TNT100
 TNT120
 TVS75-120
 TVXL90-120

Service Number 34645

RN4C

OH318EA (OHM90-110)
 † OHM120
 OH195EA (OHH60), OH195EP (OHH65)
 OHH/OHSAK40-130
 OH195SA (OHSK70), OH195SP (OHSK75)
 ‡ OH318SA (OHSK110), OH358SA (OHSK120-130)
 OH180
 OV195EA
 OV358EA (OHV110-135), OV490EA (OHV140-180)
 OV691EP (VTX691, TVT691)
 OVM120
 * OVXL120
 * OVXL/C120
 * OVXL125
 OV195

Note:

- * OVXL models with specification nos. below 202700 use RL86C.
- † OHM120 models with specification nos. below 224000 use RL86C.
- ‡ OHSK110 - 130 models with specification nos. below 223000 use RL86C.

Service Number 34046

RL86C

† OHM120
 ‡ OH318SA (OHSK110), OH358SA (OHSK120-130)
 OVM120
 * OVXL120
 * OVXL/C120
 * OVXL125

Note:

- * OVXL models with specification nos. 202700, 203000 and up, use RN4C.
- † OHM120 models with specification nos. 224000 and up, use RN4C.
- ‡ OHSK110, OHSK120-130 models with specification nos. 223000 and up, use RN4C.

Service Number 33636

RJ17LM

H30-80
 HM70-100
 HS40-50
 TVM195-220
 TVXL195-220
 VLV-all

Service Number 35552

RL82C

HH140-160
 OH120-160

Service Number 34277

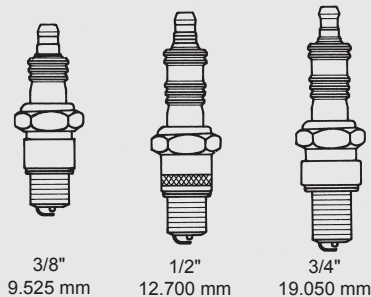
RJ8C

H22
 H25
 HH40-120
 HHM80
 HMXL70
 HT30
 HT35
 HXL35
 LAV25-50
 TVM125-170
 V40-80
 VH40-100
 VM70-100

NOTE: THE SERVICE NUMBERS LISTED BELOW WILL GIVE CORRESPONDING CHAMPION AND AUTOLITE SUBSTITUTIONS.

	Champion	Autolite
35395	- RJ19LM	NA
35552	- RL82C	4092
34046	- RL86C	425
34645	- RN4C	403
33636	- RJ17LM	245
34277	- RJ8C	304

SPARK PLUG AIR GAP ON ALL MODELS IS .030 (.762 mm)



NOTE:

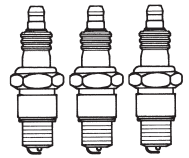
Not all spark plugs have the same heat range or reach. Using an incorrect spark plug can cause severe engine damage or poor performance. TecumsehPower uses all three of the reaches shown.

FOR TWO CYCLE INFORMATION REFER TO NEXT PAGE.

Note: If you need assistance locating your engine model numbers please check page 3 or 4.



Spark Plug Replacement



NOTE: Only models which will continue to be manufactured long term will have an updated Model designation.

2-CYCLE SPARK PLUG

Service Number 611100 RCJ6Y TC300 TCH300 TM049XA	Service Number 33636 RJ17LM AV600 AV520 TVS600 TV085XA	Service Number 35395 RJ19LM TVS840 TVXL840	Service Number 611049 RCJ8Y AH520 AH600 HSK840 HXL840 TC200 TCH200 Type 1500 TH098SA		HSK600 HSK635 TH139SA HSK845, 850 TH139SP HSK870
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EUROPA MODELS

4-CYCLE SPARK PLUG

Service Number 33636 RJ17LM	
All Horizontal Models BV BVL BVS Centura Futura HTL	LAV Legend Premier 153/173 Prisma Spectra Synergy Vantage

Service Number 34645 RN4C		
Centrua OHV Futura OHV	Geotec OHV Premier 45/55	Synergy OHV

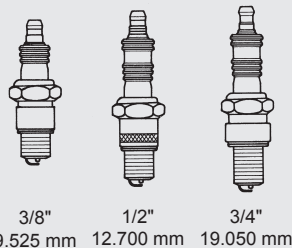
2-CYCLE SPARK PLUG

Service Number 33636 RJ17LM	
AV85/125 AV520/600	MV100S TVS600

NOTE: THE SERVICE NUMBERS LISTED BELOW WILL GIVE CORRESPONDING CHAMPION AND AUTOLITE SUBSTITUTIONS.

	Champion	Autolite
35395	- RJ19LM	NA
33636	- RJ17LM	245
611100	- RCJ-6Y	2974
611049	- RCJ-8Y	2976

SPARK PLUG AIR GAP ON ALL MODELS IS .030 (.762 mm)



NOTE: Not all spark plugs have the same heat range or reach. Using an incorrect spark plug can cause severe engine damage or poor performance. TecumsehPower uses all three of the reaches shown.

Note: If you need assistance locating your engine model numbers please check page 3 or 4.

Fuel Recommendations

Today's fuels have a short shelf life and it is recommended you buy no more than a two week supply at a time.

GASOLINE

TecumsehPower strongly recommends the use of fresh, clean, unleaded regular gasoline in all TecumsehPower engines. Unleaded gasoline burns cleaner, extends engine life, and promotes good starting by reducing the build-up of combustion chamber deposits. Leaded gasoline, gasohol containing no more than **10%** ethanol, premium gasoline, or unleaded gasoline containing no more than **15%** MTBE (Methyl Tertiary Butyl Ether), **15%** ETBE (Ethyl Tertiary Butyl Ether) **or 10%** ethanol, can be used if unleaded regular gasoline is not available.


Reformulated gasoline that is now required in several areas of the United States is also acceptable.

NEVER USE gasoline, fuel conditioners, additives or stabilizers containing methanol, gasohol containing more than 10% ethanol, unleaded regular gasoline containing more than 15% MTBE (Methyl Tertiary Butyl Ether), 15% ETBE (Ethyl Tertiary Butyl Ether) or 10% ethanol, gasoline additives, or white gas because engine/fuel system damage could result.

SPECIALTY FUELS

Fuels being marketed for use on small engines can have a significant effect on starting and engine performance. Prior to using any specialty fuel, the Reid Vapor Pressure (RVP) must be determined. Fuels with a rating of less than 50kPa (7psi) should not be used in summer, and fuel with a rating of 85kPa (12psi) should not be used during winter.

SHORT TERM STORAGE

 **WARNING** NEVER store the engine with fuel in the fuel tank inside a building with potential sources of ignition such as hot water and space heaters, clothes dryers, electric motors, etc.

If engine fuel stored in the gas tank and/or an approved gas container is to be unused without gasoline stabilizer for more than 15-30 days, prepare it for short term/seasonal storage.

TecumsehPower recommends using **ULTRA-FRESH™** or Fuel Saver Plus Gasoline Stabilizer plus Fuel System Cleaner as an acceptable method of minimizing formation of fuel gum deposits during storage. This product is available from your Authorized TecumsehPower Servicing Dealer.

Always follow mix ratio found on stabilizer container. Failure to do so may result in equipment damage.

It is not necessary to drain stabilized gas from carburetor.

FUEL TREATMENT

1. Add fuel stabilizer according to manufacturer's instructions.
2. Run engine at least 10 minutes after adding stabilizer to allow it to reach carburetor.
3. Instead of using a fuel preservative/stabilizer, you can empty the fuel tank as described under "Extended Storage".

Fuel Recommendations - *continued*

EXTENDED STORAGE

NOTES

Clean debris from engine before draining fuel from carburetor. If you have prepared your fuel for short term storage it is not necessary to drain fuel that contains stabilizer from your carburetor.

To avoid severe injury or death, DO NOT pour fuel from engine or siphon fuel by mouth.

1. To prevent serious injury from fuel fires, empty fuel tank by running engine until it stops from lack of fuel. DO NOT attempt to pour fuel from engine.
2. Run the engine while waiting until the remaining fuel is consumed.

NEVER leave the engine unattended when it is running and NEVER run engine in enclosed areas.

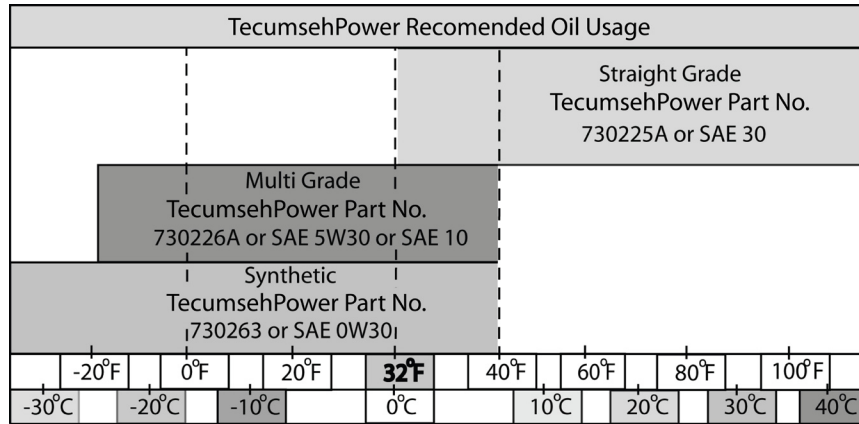
FUEL ADDITIVES

Only fuel additives such as TecumsehPower's fuel stabilizer Part No. 730245A or liquid varieties can be used when mixed properly. For winter applications, Isopropyl alcohol fuel dryers may be used in the fuel system but must be mixed at the proper ratio recommended by the manufacturer. **NEVER USE METHANOL BASED FUEL DRYERS.**

TECUMSEHPower 4-CYCLE LUBRICATION

TecumsehPower recommends the use of a high quality, brand name oil with a minimum classification of SL/SJ. Very few air cooled engines have any type of oil filtration system, making regular oil changes critical to remove

impurities from the engine and maximize engine life. **Consult the operator's or repair manual for the oil change interval and viscosity based on equipment operating temperature.**



TecumsehPower 4-CYCLE ENGINE OIL

shown with model names prior to 2004

CLASSIFICATIONS: "SL/SJ"

DO NOT USE 10W40

CAPACITIES:

Engine Model	ml	Oz.
All LAV, TVS, LEV, OVRM	630	21
ECV, TNT	630	21
V & VH50-70	810	27
TVM 125, 140	810	27
TVM 170-220	960	32
VM70-100, HHM80	960	32
VH100	1500	50
All VLV	810	27
VSK90-100	630	21
OVM120, OVXL120, 125	960	32
OHV11-13 Without Filter	960	32
OHV11-13 With Filter	1170	39
OHV13.5-17 With Filter	1800	61
OHV13.5-17 Without Filter	1650	55
TVT691 With Filter	2150	71
TVT691 Without Filter	1950	64
H, HSK30-35	630	21
HS, HSSK40-50	630	21
H, HH, HSK50-70	570	19
OHH/OHSK50-70	630	21
HMSK, HM70-100	720	26
OHSK80-100	720	26
OHM120, OHSK110*-130	840	28
HH100,120, OH120-180	1560	52

*NOTE: Model OHSK110 with a spec. of 221000 and up, have a capacity of 26 oz. (720 ml).

TecumsehPower 4-CYCLE ENGINE OIL

*shown with model names
2004 production and later*

Engine Model	ml	Oz.
LH195SA, LH195SP	630	21
LH318SA, LH358SA	720	26
LV148EA, LV148SA	630	21
LV195EA	630	21
OH195EA, OH195EP	630	21
OH195SA, OH195SP	630	21
OH318EA	720	26
OH358SA	840	28
OV195EA	630	21
OV358EA With Filter	1170	39
OV358EA Without Filter	960	32
OV490EA With Filter	1800	61
OV490EA Without Filter	1650	55
OV691EA With Filter	2150	71
OV691EA Without Filter	1950	64
OV691EP With Filter	2150	71
OV691EP Without Filter	1950	64

EUROPA MODELS *

VERTICALS

	ml	Oz.
Vantage	630	21
Prisma	630	21
Synergy	630	21
Synergy "55"	810	27
Spectra	630	21
Futura	630	21
HTL	630	21
BVS	630	21

HORIZONTALS

BH Series	630	21
Geotec Series 35-50	630	21

NOTE: Vertical shaft engines with auxiliary PTO: 26 oz. (700 ml).

Four Cycle Troubleshooting

The following is provided as a basic troubleshooting guide. Its use requires a complete review of all conditions and symptoms. Always examine the exterior for clues: leaks, excessive dirt, or obvious damage. Some repairs will require the assistance of a TecumsehPower Servicing Dealer.

Preparation

Before troubleshooting any system problem, see original equipment manufacturer's (O.E.M.) instructions.

Make your troubleshooting easier by preparing as follows:

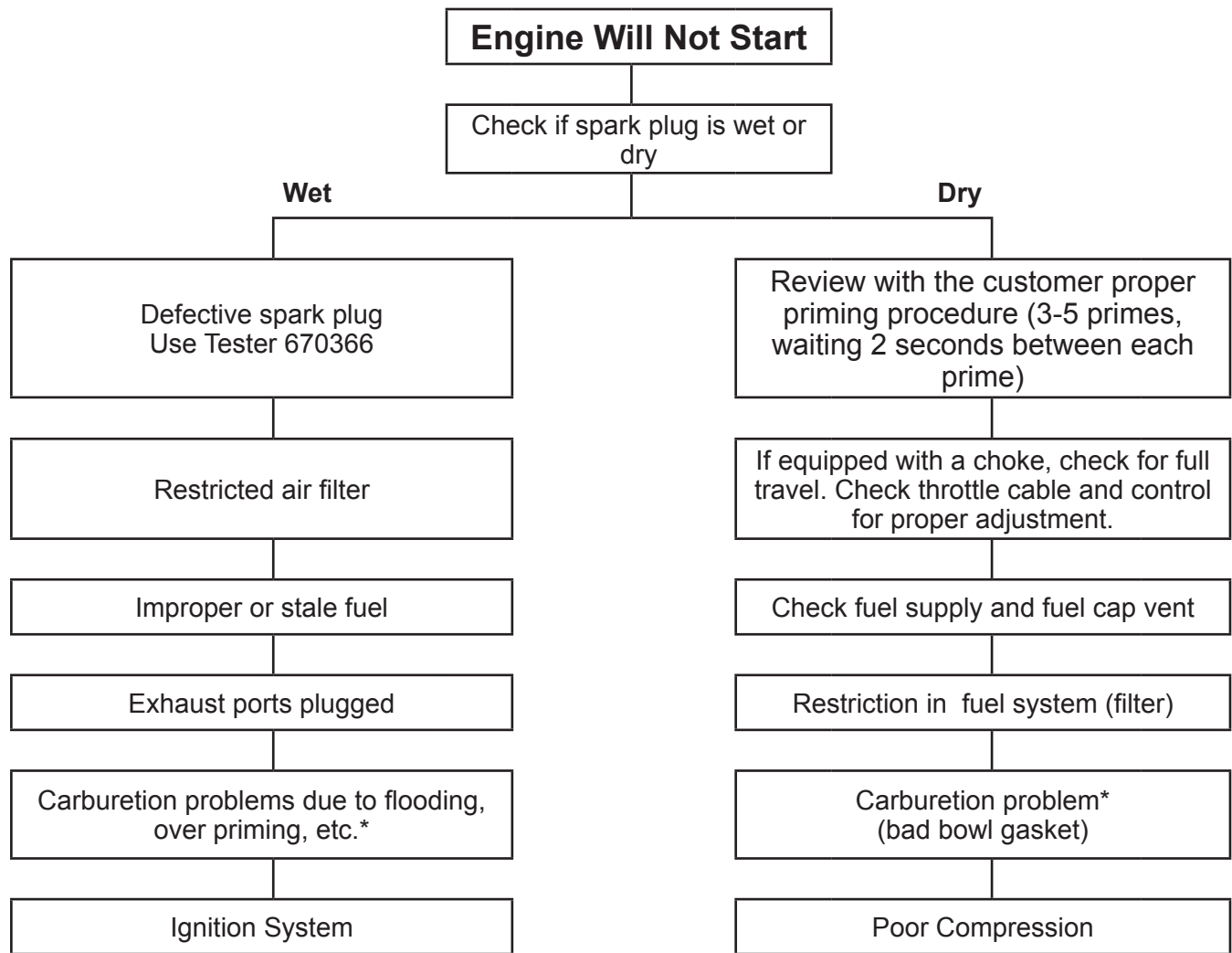
- Work in a clean, well-lighted place.
- Keep proper tools and materials nearby.
- Keep an adequate supply of clean petroleum-based solvent.

WARNING To reduce the risk of serious injury or death from fires and/or explosions, NEVER use flammable solvents (e.g., gasoline) to clean serviceable parts. Use a water-based, non-flammable solvent such as TecumsehPower Degreaser Cleaner.

CAUTION NEVER use compressed air to clean debris from yourself or your clothing. When using compressed air to clean or dry serviceable parts:

- Wear appropriate eye protection.
- Air pressure must not exceed 30psi (206kPa).
- Use only approved air blow nozzles.
- Shield yourself and bystanders from flying debris.

FUEL SYSTEM



Should more extensive repair be needed, we recommend you contact a local TecumsehPower Servicing Dealer for repair. Repair manuals are also available from your local dealer or direct from www.TecumsehPower.com. A complete list of the available manuals can be found at the end of this book.

NOTE: Refer to Technician's Handbook for a more detailed list of remedies.

Four Cycle Troubleshooting - continued



WARNING

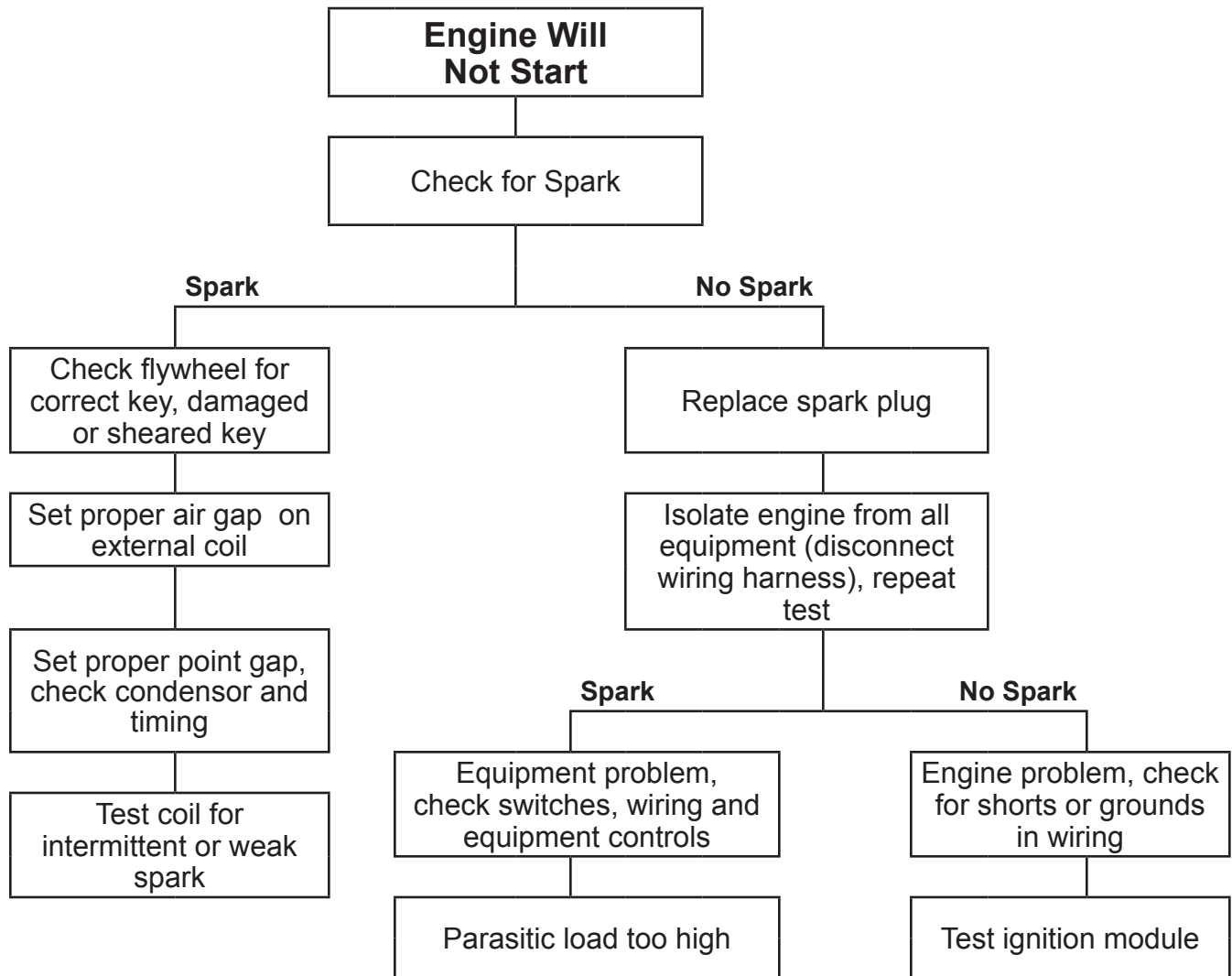
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IGNITION SYSTEM



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NOTE: Refer to Technician's Handbook for a more detailed list of remedies.

TECUMSEHPOWER 2-CYCLE ENGINE OIL

The proper type and ratio of 2-cycle oil is critical to long life and low maintenance of the engine. The use of non-certified oils and improper mix ratio's can cause severe engine damage and possibly void warranty consideration.

The following is a list of 2-cycle engine oil classifications which are certified for use in TecumsehPower 2-cycle engines:

- National Marine Manufacturers Association, (NMMA), TC-WII or TC-W3
- American Petroleum Institute, (API), TC
- Japanese Automobile Standard Organization, (JASO), FB or FC

TWO-CYCLE FUEL/OIL MIX RATIOS		
24:1	32:1	50:1
AV520 Types 670 & 653, TV085 TV085XA (AV600 Type 600-10 & Up) TC200, TCH200, TCH300 TM049XA (TC300) MV100S	TVS600 ALL TYPES AH600	TVS / TVXL HSK840 - 870 - TH139 HSK600 - 635 - TH098

Sears/Craftsman 40:1 2-Cycle Oil has been tested and approved for use in all engines, EXCEPT the TC / TM Models which require a 24:1 Ratio.

2-CYCLE SYNTHETIC BLEND

ENGINE OIL WITH FUEL STABILIZER

PART NO. 730227D

TecumsehPower 2-CYCLE ENGINE OIL may be used in a variety of 2-cycle engines including: outboards, lawnmowers, snow-blower, string trimmers, and edgers at any fuel/oil mixing ratio up to 50:1.

- Superior Lubricity **Extends** engine life by reducing wear
- Longer Spark Plug life through reduced fouling
- Reduces Carbon Build-Up extending required service intervals
- Helps maintain emissions compliance which helps our environment
- Contains Fuel Stabilizer-Extends fuel life and protects fuel system

ENGINE FUEL MIX				
	U.S. Gasoline	U.S. Amount of Oil To Be Added	METRIC Petrol	METRIC Amount of Oil To Be Added
24:1	1 Gallon	5 oz.	4 Liters	167 ml
	2 Gallons	11 oz.	8 Liters	333 ml
	5 Gallons	27 oz.	20 Liters	833 ml
32:1	1 Gallon	4 oz.	4 Liters	125 ml
	2 Gallons	8 oz.	8 Liters	250 ml
	5 Gallons	20 oz.	20 Liters	625 ml
50:1	1 Gallon	2.5 oz.	4 Liters	80 ml
	2 Gallons	5 oz.	8 Liters	160 ml
	5 Gallons	13 oz.	20 Liters	400 ml

Two Cycle Troubleshooting

The following is provided as a basic troubleshooting guide. Its use requires a complete review of all conditions and symptoms. Always examine the exterior for clues: leaks, excessive dirt, or obvious damage. Some repairs will require the assistance of a TecumsehPower Servicing Dealer.

Preparation

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Make your troubleshooting easier by preparing as follows:

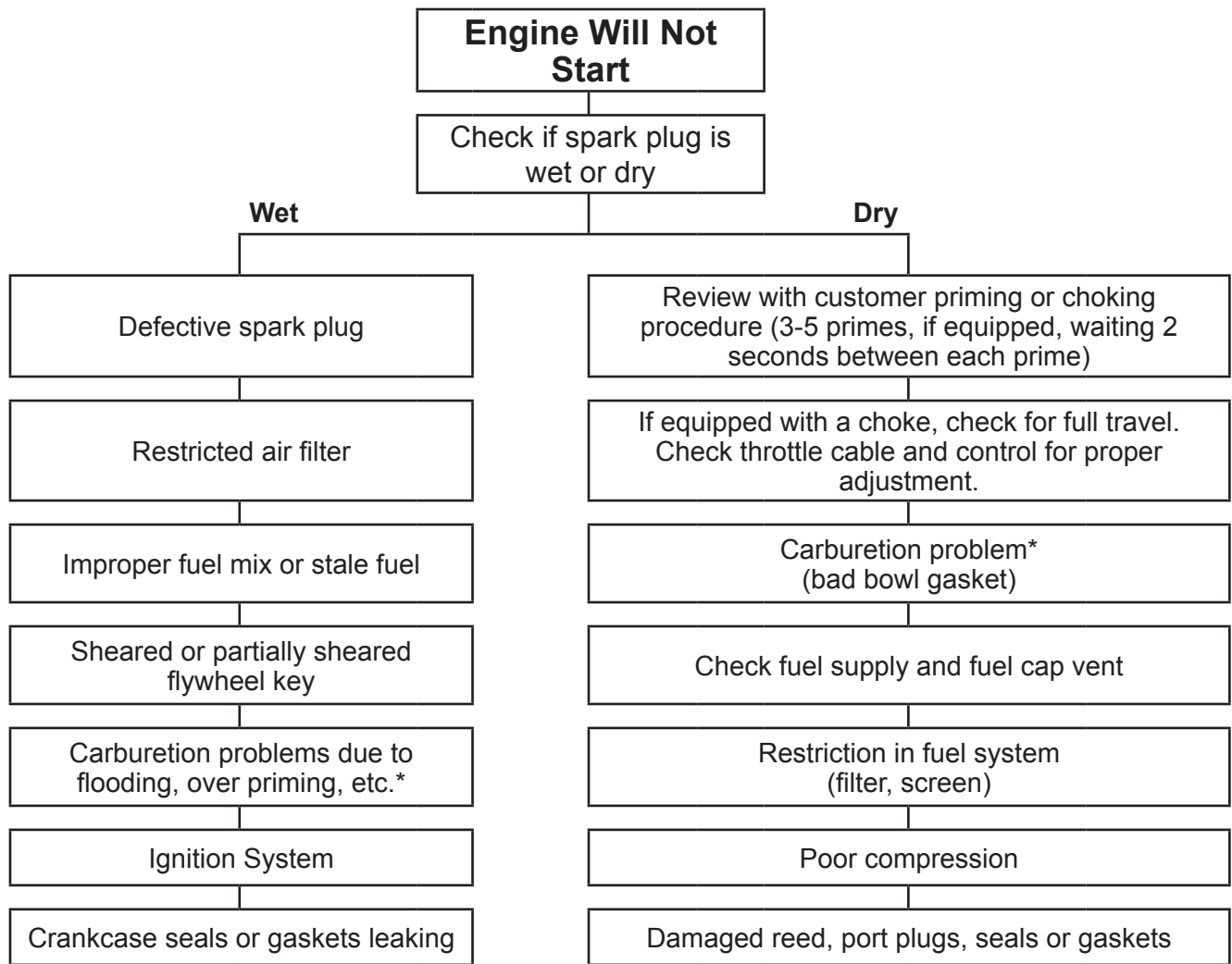
- Work in a clean, well-lighted place.
- Keep proper tools and materials nearby.
- Keep an adequate supply of clean petroleum-based solvent.

WARNING To reduce the risk of serious injury or death from fires and/or explosions, NEVER use flammable solvents (e.g., gasoline) to clean serviceable parts. Use a water-based, non-flammable solvent such as TecumsehPower Degreaser Cleaner.

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FUEL SYSTEM



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Two Cycle Troubleshooting - continued



WARNING

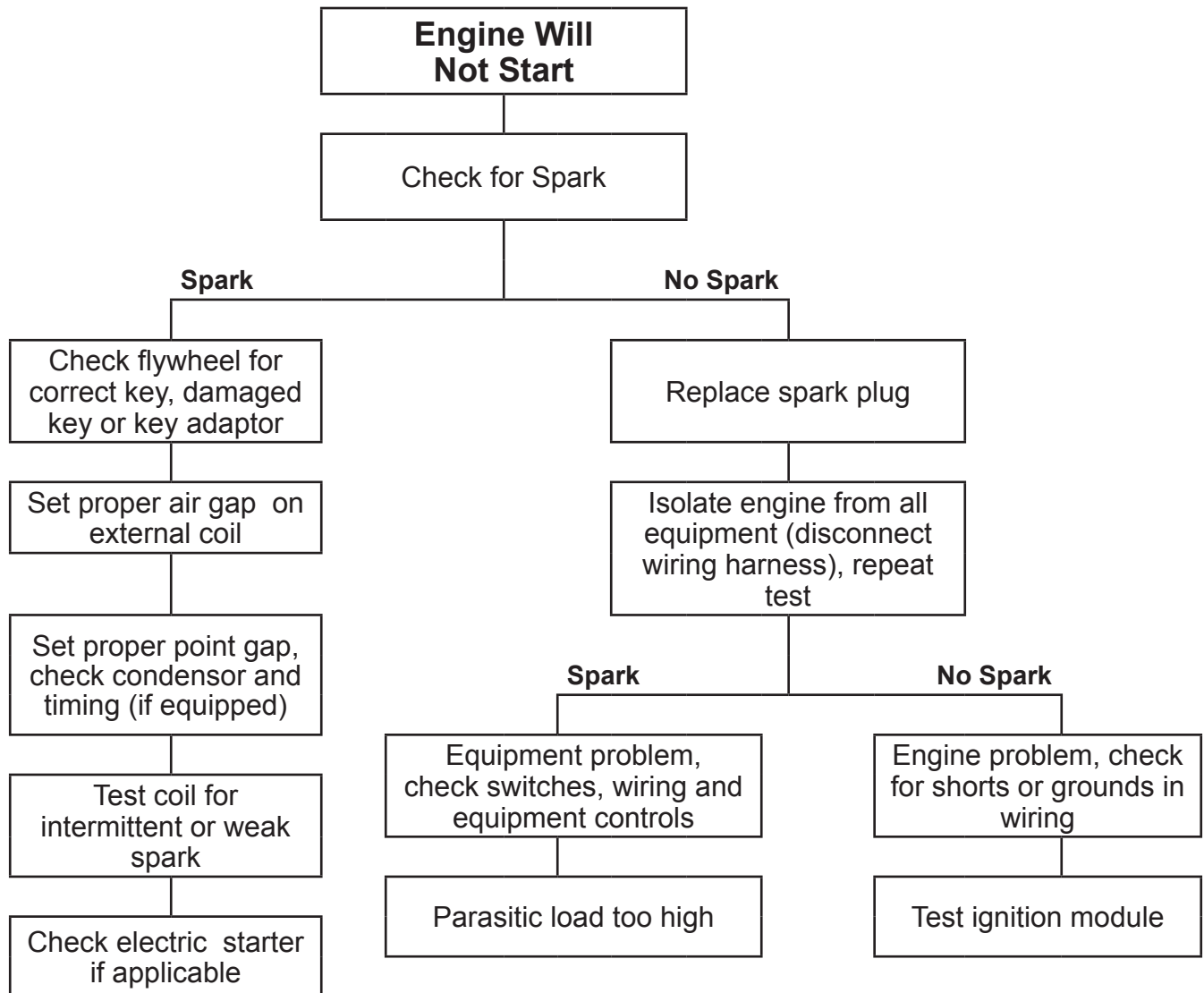
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IGNITION SYSTEM



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NOTE: Refer to Technician's Handbook for a more detailed list of remedies.

Cross Reference for Specification - To - Model Number Designation

This cross reference chart allows you to determine an engine Model Number if you only have the Specification Number.

VERTICAL 4-CYCLE ENGINES

Specification Number Series	Model Number	Specification Number Series	Model Number
10000	TNT100	145000	ECV100
12000	TNT120	147000	ECV105
20000	LAV25, OVRM55	148000	VH80
20500	OVRM105	149000	VH100
21000	OVRM60	150000	V & VM80, TVM195
21800	OVRM60	150200	TVM & TVXL195
22000	OVRM65, OVRM120	150500	TVM195
23000	OV195EA (RM)	151000	ECV110, TVM195
23500	OV195EA (Utility)	151500	TVM220
30000	LAV30	152000	ECV120
33000	TVS75	157000	VM100, TVM220
40000	LAV35	157200	TVM & TVXL220
42000	OVRM905 (Sears Only)	157400	TVM220
42600	OVRM40, OVRM45 (Premier Engine)	200000	OVM120
42900	OVRM40 (High Tech Look)	202000	OVXL120, OVXL125
43000	TVS90	202200	OVXL120 (I/C)
43600	TVS90 (Premier Engine)	202300	OHV11, OHV115
43700	TVS90, TVXL90	202400	OVXL125
43900	TVS90 (High Tech Look)	202500	OHV115
44000	TVS100	202600	OVXL125 (I/C)
44600	TVS100 (Premier Engine)	202700	OHV12, OVXL120 (Tec.1200)
44800	TVS100	203000	OHV125, OVXL125 (Tec1250)
46000	TVS90, TVXL90	203200	OHV13
46600	TVS90	203500	OVXL125 (Tec.1250I/C), OHV13/135
48000	TVS90	203600	OHV14/140
50000	V40	203800	OHV145
50200	LAV40	204000	OHV15/150
52600	OVRM50, OVRM55 (Premier Engine)	204200	OHV16/160
52800	OVRM50, OVRM55	204400	OHV165
52900	OVRM50, OVRM55 (High Tech Look)	204500	OHV155
53000	TVS105	204600	OHV17/170
53600	TVS105 (Premier Engine)	204800	OHV175
53800	TVS105	206000	OHV110
53900	TVS105 (High Tech Look)	206200	OHV115
54000	TVXL105	206400	OHV120
56000	TVS105, TVS & TVXL115	206600	OHV125
56600	TVS105, TVS115 (Premier Engine)	206800	OHV130
56800	TVS115	206900	OHV135, OV358EA (Sm. Enduro)
56900	TVS105, TVS115 (High Tech Look)	208000	OHV180, OV490EA (Lg. Enduro)
57000	TVS & TVXL115	334000	LEV90, LV148EA
57600	TVS115 (Premier Engine)	334500	VSK90, LV148SA
57800	TVS115	335000	LEV100
57900	TVS115 (High Tech Look)	338000	LEV100
60000	V50, TVM125	338500	VSK100
61000	TVS & TVXL115	340000	LEV100
61600	TVS & TVXL115	345000	LEV100
61800	TVS115	346000	LEV105
61900	TVS115	347000	LEV105
62000	LAV50	348500	VSK105
62100	LAV50 & TVS115	350000	LEV115
63000	TVS120	355000	LEV115
63200	TVS120, TVEM120	360000	LEV115
63600	TVS120 (Premier Engine)	361000	LEV120
63900	TVS120 (High Tech Look)	361400	VSK120
66000	TVS120	361500	LEV120, LV195EA (Utility)
66100	TVS120	362000	LEV120, LV195EA (RM)
70000	V60, TVM140	400000	VLV40
80000	VH40	500000	ULT, VLV B24, VLXL50, & VLV126
90000	VH50	501000	ULT, VLV, VLXL55, & VLV126
100000	VH60	502000	ULT, VLV60, VLV65, & VLV126
125000	V70	502500	VLV65, VLV66
127000	VM70, TVM170	600400	TVT691
127200	TVXL170	600800	TVT691, OV691EA (Twin)
135000	VH70	600900	VTX691, OV691EP (Twin)

Cross Reference for Specification - To - Model Number Designation

This cross reference chart allows you to determine an engine Model Number if you only have the Specification Number.

HORIZONTAL 4-CYCLE ENGINES

Specification Number Series	Model Number	Specification Number Series	Model Number
15000	H22	120000	HH120
25000	H25	130000	H70
26000	OHH45	130200	HSK70
35000	H30	132000	HM & HMSK70
35400	HSK30	132500	HMXL70
35800	H30	140000	HH70
36700	H30	146000	ECH90
45000	H & HT35	155000	H & HM80
45400	HSK35	155000	HMSK80
45800	H35	155800	HM85
46700	H35	155900	HM & HMSK85
47000	HXL35	156000	HM90
55000	H40	156000	HM90
55200	HS & HSSK40	156500	HMSK90, LH318SA
55500	HSK40	159000	HM & HMSK100, LH358SA
55700	H40	159900	HMSK105
55800	H40	159950	HMSK110
55900	HSSK40	160000	HH & OH140
65000	H50	170000	HH150 & 160
65300	HSK50	170000	OH160
67000	HS & HSSK50, LH195SA	175000	OH120
67500	HSSK55, LH195SP	180000	OH180
68000	OHH50	190000	HHM80
68500	OHSK50	220000	OHM120
69000	OHH55	221000	OHSK110
69500	OHSK55	221200	OHSK80
71100	OHH60, OH195EA	221400	OHSK90
71500	OHSK60	221600	OHSK100
71700	OHH65	221700	OHSK110
71800	OHH65, OH195EP	221800	OHSK115, OH318SA (Premium)
71900	OHSK65	222000	OHSK120
72000	OHH70	222300	OHM90
72500	OHSK70, OH195SA (Premium)	222500	OHM100
73500	OHSK75, OH195SP (Premium)	222700	OHM110, OH318EA
75000	H60	223000	OHSK90
76000	HSK60	223400	OHSK110
85000	HH40	223600	OHSK120
95000	HH50	223700	OHSK125
105000	HH60	223800	OHSK130, OH358SA (Premium)
110000	HH80		
115000	HH100		

VERTICAL 2-CYCLE ENGINES

Specification Number Series	Model Number
3600	TC300, TM049XA
670000	AV520, TV085XA

HORIZONTAL 2-CYCLE ENGINES

Specification Number Series	Model Number
1720	HSK635, TH098SA
8300	HSK850, TH139SA
8700	HSK870, TH139SP



Repair Manuals

Service Number 740043 or 695244A

- † OHM120
- ‡ OH318SA (OHSK110), OH358SA (OHSK120-130)
OH318EA (OHM90-110)
- † OHM120
OH195EA (OHH60), OH195EP (OHH65)
OHH/OHSK40-130
OH195SA (OHSK70), OH195SP (OHSK75)
- ‡ OH318SA (OHSK110), OH358SA (OHSK120-130)
OVM120
- * OVXL120,
- * OVXL/C120
- * OVXL125
OV195EA
OV358EA (OHV110-135)
OV490EA (OHV140-180)
OV691EP (VTX691, TVT691)
OVM120
- * OVXL120
- * OVXL/C120
- * OVXL125

Service Number 691462A

- HH140-160
- OH120-180

Service Number 740047 or 692508

- AH520
- AH600
- HSK840
- HXL840
- TC200
- TCH200 Type 1500
- TH098SA (HSK600), HSK635
- TH139SA (HSK845, 850)
- TH139SP (HSK870)
- AV600
- TV085XA (AV520)
- TVS600

Service Number 694988

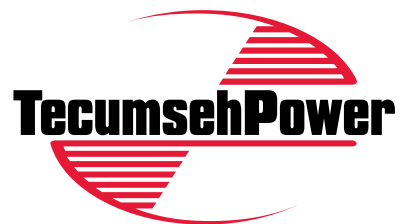
- TVS840
- TVXL840

Service Number 694782

- TCH300
- TM049XA (TC300)

Service Number 740049 or 692509

- ECV100-120
- HMSK70, LH318SA (HMSK80), HMSK90,
H22
- H25
- H30-80
- HM70-100
- HH40-120
- HHM80
- HMXL70
- HT30
- HT35
- HXL35
- HS40-50
- HSK30-70
- HSSK40, LH195SA (HSSK50), LH195SP (HSSK55)
LH358SA (HMSK100), HMSK110
- LAV25-50
- LEV80, LV148EA (LEV90), LV195EA (LEV120)
LV148SA (VSK90), VSK100
- TNT100
- TNT120
- TVS75-120
- TVXL90-120
- TVM125-170
- TVM195-220
- TVXL195-220
- V40-80
- VH40-100
- VM70-100
- VLV-ALL



TecumsehPower Company
900 North Street
Grafton, Wisconsin 53024

1-800-558-5402