



SILVER & GOLD Packages

Service Replacement Engine Operator's Guide

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Dear Michigan Motorz Marine Engine Owner,

Thank you and congratulations on selecting the finest inboard/sterndrive replacement engine for your boat. Please take a few minutes to familiarize yourself with the specifications and maintenance procedures for your engine that are contained in the manual.

Please make sure to fill out the owners registration information for your engine to keep for your records and mail, e-mail, or fax a copy to Michigan Motorz at the address or fax number indicated.

The warranty will be activated when Michigan Motorz receives a copy of the warranty registration card either by mail, e-mail, or fax.

PLEASE NOTE!

WARRANTY IS NOT ACTIVATED UNTIL ENGINE REGISTRATION IS RECEIVED.

**Record Information & Keep
For Your Records!**

Order/Invoice/Packing Slip Number:
#000 _____

Engine Part Number:

Engine Serial Number:

Cubic Inch / Liter:
_____ / _____ L

Date Installed:
_____/_____/_____

Installer:

SILVER GOLD

Engine Packages Include The Following:

	4.3L Silver	5.7L Silver	5.7L Gold	7.4L Silver
Vortec Engine	X	X	X	X
4Barrel Hi-Rise Intake Manifold*	X*	X	X	X
Spark Plugs & Wires	X	X	X	X
Electric Fuel Pump Kit	X	X		
Electric Fuel Pump w/ Water/Fuel Separator			X	X
Fuel Pump Safety Switch (Low Oil Pressure)	X	X	X	X
Flexible Fuel Line (Pump to Carburetor)	X	X	X	X
Delco EST Distributor Kit	X	X	X	X
Engine Oil Filter	X	X	X	X
Dipstick Indicator & Tube Kit	X	X	X	X
EZ Oil Drain Hose Kit	X	X	X	X
PCV Valve and Breather Tube	X	X	X	X
14" or 12 ¾" Flywheel	X	X	X	X
Carburetor w/ Electric Choke	X	X	X	X
Throttle Linkage w/ Clamp	X	X	X	X
Flame Arrestor	X	X	X	X
Exhaust Manifolds			X	
Exhaust Elbows			X	
Thermostat 160° F			X	
Thermostat Housing			X	
Circulation Pump Hose			X	
Oil Pressure Sender (Single Helm Sender)			X	
Water Temperature Sender (Single Helm Sender)			X	
Universal Engine Wire Harness			X	

*Optional 2 Barrel Intake Manifold

4.3L Silver Engine Specifications

Number of Cylinders	V-6
Displacement	262 c.i.d. (4.3L)
Bore/Stroke	4.0012 x 3.480 in (101.63 x 88.39 mm)
Compression Ratio	9.4:1
Compression Pressure (see below Note 1)	Minimum 100 PSI x 6 (690 kPa)
Idle RPM in Neutral (see below Note 2)	650 + or - 50 RPM
Operating Range at W.O.T.(Wide Open Throttle)	4400-4800 RPM
Oil Pressure at Idle	Minimum 10 PSI (41 kPa) - Hot
Oil Pressure at 2000 RPM	Minimum 20-60 PSI (124 kPa) - Hot
Oil Filter	Oil Filter: AC Delco PF52
Oil Requirements	15W-40 Meeting API SJ/CH4/CG4
Fuel Pump Pressure	5-7 PSI Max (55.2 kPa)
Fuel Requirements	87 Octane (R+M)/2 or higher, NON-ETHANOL
Electrical System	12 Volt DC Negative Ground
Minimum Battery Requirements	650cca/700mca/120 Ah (Cold Cranking Amps)
Firing Order (Standard Rotation)	1-6-5-4-3-2 (CLOCKWISE DISTRIBUTOR ROTATION)
Spark Plug Type	AC Delco MR43LTS
Carburetor	Standard: Edelbrock 1409 Optional: Holley 4160 (4.3L)

Notes:

1) Minimum recorded compression in any one cylinder should not be *less than* 70% of the highest recorded cylinder.

2) Measured using an accurate shop tachometer at normal operating temperature.

*Timing must be set using special procedures indicated. Special Tools Required.

*Always use dipstick indicator to determine the exact quantity of oil required. Do not fill above "FULL" mark.

5.7L Silver & Gold Engine Specifications

Number of Cylinders	V-8
Displacement	350 c.i.d. (5.7L)
Bore/Stroke	4.0012 x 3.480 in (101.63 x 88.39 mm)
Compression Ratio	9.4:1
Compression Pressure (see below Note 1)	Minimum 100 PSI (690 kPa)
Idle RPM in Neutral (see below Note 2)	650 + or - 50 RPM
Operating Range at W.O.T.(Wide Open Throttle)	4400-4800 RPM
Oil Pressure at Idle	Minimum 10 PSI (41 kPa) - Hot
Oil Pressure at 2000 RPM	Minimum 20-60 PSI (124 kPa) - Hot
Oil Filter	Oil Filter: AC Delco PF25
Oil Requirements	15W-40 Meeting API SJ/CH4/CG4
Fuel Pump Pressure	8 PSI Max (55.2 kPa)
Fuel Requirements	87 Octane (R+M)/2 or higher, NON-ETHANOL
Electrical System	12 Volt DC Negative Ground
Minimum Battery Requirements	650cca / 700mca / 120 Ah (Cold Cranking Amps)
Firing Order (Standard Rotation)	1-8-4-3-6-5-7-2
Spark Plug Type	AC Delco MR43LTS
Carburetor	Standard: Edelbrock 1409 Optional: Holley 4150 (5.7L)

Notes:

- 1) Minimum recorded compression in any one cylinder should not be *less than* 70% of the highest recorded cylinder.

- 2) Measured using an accurate shop tachometer at normal operating temperature.

*Timing must be set using special procedures indicated. Special Tools Required.

*Always use dipstick indicator to determine the exact quantity of oil required. Do not fill above "FULL" mark.

7.4L Silver Engine Specifications

Number of Cylinders	V-8
Displacement	454 c.i.d. (7.4L)
Bore/Stroke	4.25 x 4.00 in (107.95 x 101.6 mm)
Compression Ratio	8.6:1
Compression Pressure (see below Note 1)	Minimum 100 PSI (690 kPa)
Idle RPM in Neutral (see below Note 2)	650 + or - 50 RPM
Operating Range at W.O.T.(Wide Open Throttle)	4200-4600 RPM
Oil Pressure at Idle	Minimum 10 PSI (41 kPa) - Hot
Oil Pressure at 2000 RPM	Minimum 20-60 PSI (124 kPa) - Hot
Oil Filter	Oil Filter: AC Delco PF25
Oil Requirements	15W-40 Meeting API SJ/CH4/CG4
Fuel Pump Pressure	8 PSI Max (55.2 kPa)
Fuel Requirements	87 Octane (R+M)/2 or higher, NON-ETHANOL
Electrical System	12 Volt DC Negative Ground
Minimum Battery Requirements	650cca / 700mca / 120 Ah (Cold Cranking Amps)
Firing Order (Standard Rotation)	1-8-4-3-6-5-7-2
Spark Plug Type	AC Delco MR43LTS
Carburetor	Standard: Edelbrock 1410 Optional: Holley4175 (7.4L)

Notes:

1) Minimum recorded compression in any one cylinder should not be *less than* 70% of the highest recorded cylinder.

2) Measured using an accurate shop tachometer at normal operating temperature.

*Timing must be set using special procedures indicated. Special Tools Required.

*Always use dipstick indicator to determine the exact quantity of oil required. Do not fill above "FULL" mark.

4.3L, 5.7L, & 7.4L Delco EST Distributor Timing Instructions

Please visit: <http://www.youtube.com/michiganmotorz2008> and click on the “EST IGNITION TIMING 3.0L MERCURISER” video to see an overview of the Delco Distributor Kit timing procedure.

The Delco Voyager distributor is a fully self-contained marine ignition system. Installation is not complicated, but the timing setup must be exact. After proper installation of the distributor and mounting of the coil, plug one end of the **thick black sheathing wrapped wire** into the distributor and the other end into the coil. Next, connect the “pigtail” plug that has a **GREY** and **PURPLE** wire into the ignition coil. The **GREY** wire is your tachometer gauge lead; it must go to the existing **GREY** wire(s) in your engine harness. The **PURPLE** wire is the 12 volt + lead. This wire connects to your existing 12 volt + purple wire, which supplies the coil and distributor power.

Depending on the year of your original engine and the engine wiring harness, there may be a voltage resistor or a resistor wire in the wiring harness to check for. Generally speaking, this resistor was used with points-based ignition systems. To check, simply place a voltmeter **RED** lead to the **Purple** lead on the engine harness, and the **BLACK** lead to a good ground. You should have 12 Volts, battery voltage - about 12.5 volts is a fully charged battery. If your voltage reading is 10.9 volts or lower, you may have an in-line resistor*. **BYPASS** this resistor by cutting it out of the harness. If the resistor wire is difficult to access, just use a new wire altogether to bypass this resistor wire.

Now, recheck the voltage, it should be 12 volts or battery voltage. If you do not have 12 volts, the ICM (Ignition Control Module) will not function correctly and can be damaged from low voltage operation while the engine is running. Connect **PURPLE** lead on engine harness to **PURPLE** lead on the coil. Now you are ready to start the engine and set the BASE timing.

* Older engines using a points-based ignition system used a *lower* voltage (ie: 9V - 10V) to run the coil and the other ignition system components. This helped eliminate burnt-out points that would arc-out from higher voltages (12V or higher/battery voltage).

Initial Timing Procedures of the Delco EST Distributor

The **Timing Shunt** is a timing tool used to set initial (base) timing of your Delco EST System. The timing shunt is a 3 prong plug with white looped wire and a single black wire.

AFTER THE ENGINE IS RUNNING AND HAS WARMED UP TO NORMAL OPERATING TEMPERATURE AT IDLE**, connect the timing shunt black wire lead to 12 Volts **POSITIVE**, preferably to the battery **POSITIVE** post, and plug the timing shunt into the 4-prong slot on the distributor. This will lock the timing in BASE TIMING MODE with NO timing advance at any engine speed. Your engine will also run at slightly lower than normal IDLE speed, and will run a bit rough. This is NORMAL.

Now, using a timing light, set BASE timing to EST specifications on Page 9. MAKE SURE IT IS SET **EXACT**. If timing is lower than specifications, horsepower will be lower. If timing is set higher than specifications, pre-ignition melt down, blown head gaskets, and detonation will occur and WARRANTY WILL BE VOID. Now remove the **Timing Shunt**. Timing is now set. Check total timing with advance at best boat trim on plane and at max RPM.

** If the timing shunt is connected to 12+ volts while attempting to start the engine, the ICM (Ignition Control Module) in the distributor may be damaged, and is not covered under warranty. If the engine needs to be restarted while the timing shunt is installed and connected, DISCONNECT the timing shunt before restarting to avoid ICM damage.

Timing Specifications

ENGINE TYPE	DISPLACEMENT	CARBURETOR	INITIAL (BASE)	TOTAL	MAX RPM
V6 6 CYL	4.3L 262ci Vortec	4 BBL	2	26	4800
V8 8 CYL	5.7L 350ci Vortec	4 BBL	8	26	5000
V8 8 CYL	7.4L 454ci Vortec	4 BBL	12	32	4800

AT NO TIME SHOULD THE ENGINE EXCEED THE MAXIMUM TOTAL ADVANCE. INTERNAL DAMAGE WILL OCCUR AND IS NOT COVERED UNDER WARRANTY.

FIRING ORDER

4.3L V6 = 1, 6, 5, 4, 3, 2

5.7L V8 = 1, 8, 4, 3, 6, 5, 7, 2 (STANDARD Rotation)

5.7L V8 = 1, 2, 7, 5, 6, 3, 4, 8 (REVERSE Rotation)

7.4L V8 = 1, 8, 4, 3, 6, 5, 7, 2 (STANDARD Rotation)

7.4L V8 = 1, 2, 7, 5, 6, 3, 4, 8 (REVERSE Rotation)

Simplified Timing Instructions (Carbureted Engines Only)

Assuming the engine is already at TDC (Top Dead Center) - where the #1 cylinder is on the compression stroke, and that your distributor is dropped in so the ROTOR is pointed toward the #1 spark plug wire on the distributor cap, you can proceed to set initial timing on the engine.

1. Connect the inductive pickup of your timing light to the number one (1) spark plug wire. Connect the timing light power lead to a 12 volt power source (i.e. engine battery). **(DO NOT connect to 12 volts on the alternator, the voltage may fluctuate rapidly and cause inaccurate timing).**
2. Loosen distributor clamp SLIGHTLY - just enough to allow minor rotation of the distributor.
3. Start engine and allow to warm to operating temperature. Bring engine to idle (650-800 RPM). You may need to rotate the distributor slightly left or right to maintain a smooth idle. This is normal until the engine is properly timed. There is no need to adjust your carburetor.

4. **WHILE THE ENGINE IS RUNNING** install the timing shunt tool (special plug with white looped wire and single black wire) into the terminal connector on the distributor. Do not install while off or damage to the ICM (Ignition Control Module) may occur and is NOT covered under warranty.
5. **Plug in your adjustable timing light (digital LCD display) to set initial and total timing. An adjustable timing light is REQUIRED. Old-school “strobe lights” are far too inaccurate. If you don’t have one, AutoZone, O’Rileys, and many other local automotive parts stores have a tool rental department – many of which are FREE rentals and only require a temporary deposit.**
6. Connect the black wire of the timing shunt tool to a battery **POSITIVE** voltage. Engine RPM will drop when attached to 12V+. This indicates the engine is now in BASE TIMING MODE. You can now proceed with distributor timing.
7. Rotate distributor to set **initial BASE timing**. (For 5.7L Vortec marine engines, initial base timing is 8 degrees if using 87 octane gas). Refer to the timing chart on the previous page of this manual for timing specifications.
8. Tighten distributor clamp to hold distributor in position when **initial timing** is obtained.
9. Recheck timing to verify the distributor did not rotate slightly while tightening the clamp
10. Remove the timing shunt tool from the distributor.
11. Check **total timing** at 2000, 3000, and 4000 RPM. (For example, a 5.7L Vortec marine engine, total timing will be about 26 degrees).
12. Disconnect and remove timing light.

Delco EST Ignition System Troubleshooting:

If you are having any ignition system issues, lack of full advance, etc., remember this is a very simple ignition system. If your old ignition system appeared to be having problems, always remember the root cause of the original ignition system **MUST BE DETERMINED** to avoid a repeat failure.

Often problems with faulty shift interrupt switches or shorted/failing engine tachometers are the cause of the problem, which are NOT part of this ignition kit.

If you are having **ANY** issues, **ISOLATE THE IGNITION SYSTEM**. Simply disconnect your shift interrupt wire (the single black wire coming off the distributor) to isolate the Delco EST ignition system from the shift interrupt switch (OMC and MerCruiser sterndrive models only). Shift interrupt switches often short to ground or stick internally from moisture. If you are still having an issue, especially with weak spark or poor engine performance, disconnect your GRAY wire, which is your tachometer signal wire coming off the ignition coil. This will eliminate the chance that the tachometer is grounding or partially grounding your ignition coil, weakening the spark at the plugs. Old tachometers will start to bounce around erratically and are a sign of end-of-life. Disconnect the GRAY wire to eliminate this possible issue.

OMC Shift Interrupt Switch Hookup

*** NOTE: See “*OMC Shift Interrupt Wiring Diagram*” on Page 12. ***

Before starting, please note the old OMC ESA ignition module and overstroke switch are NO LONGER USED. The Delco EST system has its own built-in ignition module located under the distributor cap. Because of this, there is no need to reuse the ESA module. You can cut it out of the system and unbolt it from the engine.

Remember to safely tape back any remaining wiring which will no longer be used.

1. Locate the shift interrupt switch on top of the engine.
2. Cut the **BLUE** wire on both sides of the shift switch, leaving a few inches of wire hanging off the switch to splice into next.
3. Connect one of the **BLUE** wires to any keyed 12 volt source, such as the purple coil wire, using an IN-LINE fuse holder. Connect the remaining **BLUE** wire to the **SINGLE BLACK** wire with the plug end, which was supplied with the ignition wiring kit.
4. Plug the **SINGLE BLACK** wire in the distributor.
5. The shift interrupt hookup is complete. You can test the button function by simply starting the engine and tapping the button with your finger. If the engine momentarily hesitates, the switch is functioning normally. If you hold the button down for too long, it **WILL** stall the motor. This is normal.

NOTE: Make sure that the Travel on the switch is adjusted so it snaps back to the OFF position.

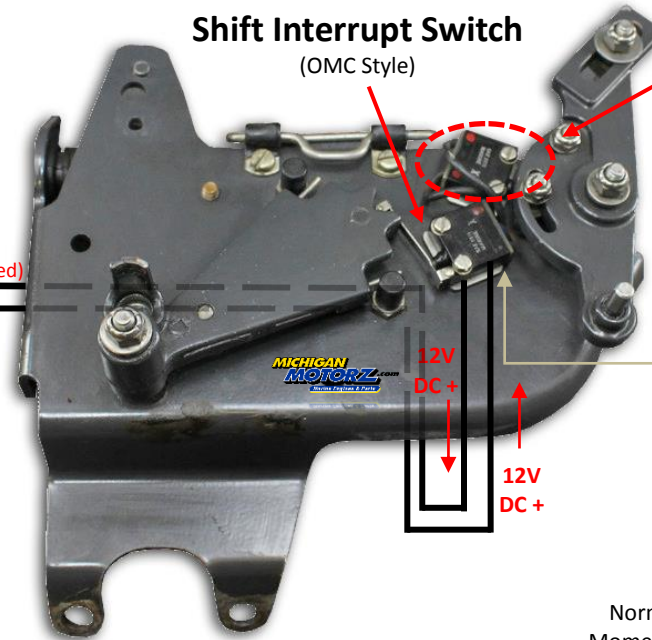
NOTE: *Many older OMC engines used in-line voltage resistors that lower voltage for the ESA module. Check the purple wire going to the coil for AT LEAST 12V+ to 14V+ DC. Any less than 12 volts will be insufficient for the distributor module to function properly. YOU MUST REMOVE THE IN-LINE RESISTOR. If you have difficulty setting timing or achieving FULL spark advance, you can always test/verify proper operation with a good 12V+ source, DIRECTLY from your battery post. This will pinpoint a hidden in-line resistor within the primary engine wire harness or another electrical issue.*

Delco EST Distributor OMC Shift Interrupt Wiring

Delco EST Distributor (I-4, V6, & V8 Models)



Shift Interrupt Switch (OMC Style)



Over-stroke Switch
(No longer used.
Remove and discard.)

Heat-Shrink
(Watertight)
Butt Connectors

12V DC +
(When Shift
Interrupt is Pressed)

12V DC +

Re-use BOTH original
shift switch wires.
Use butt-connectors to
make connections.

12V
DC +

12V
DC +

12V DC +

12V DC +

Coil-to-Distributor Wire Harness (Included with Distributor Kit)

Purple/Grey Wire Harness (Included with Distributor Kit)

Normally OPEN,
Momentary CLOSED
Shift Switch
(POWER THROUGH SWITCH
ONLY WHEN PRESSED)

2 Amp In-Line Fuse Holder (Purchase Locally)

Delco EST Ignition Coil (I-4, V6, & V8 Models)

Note: Some engines have TWO existing purple ignition wires connected to the coil, some have only ONE. IF you have TWO, crimp BOTH wires into the butt connector.

Original Ignition Coil
Wires (Purple/Grey)

Tachometer Wire
(Grey)

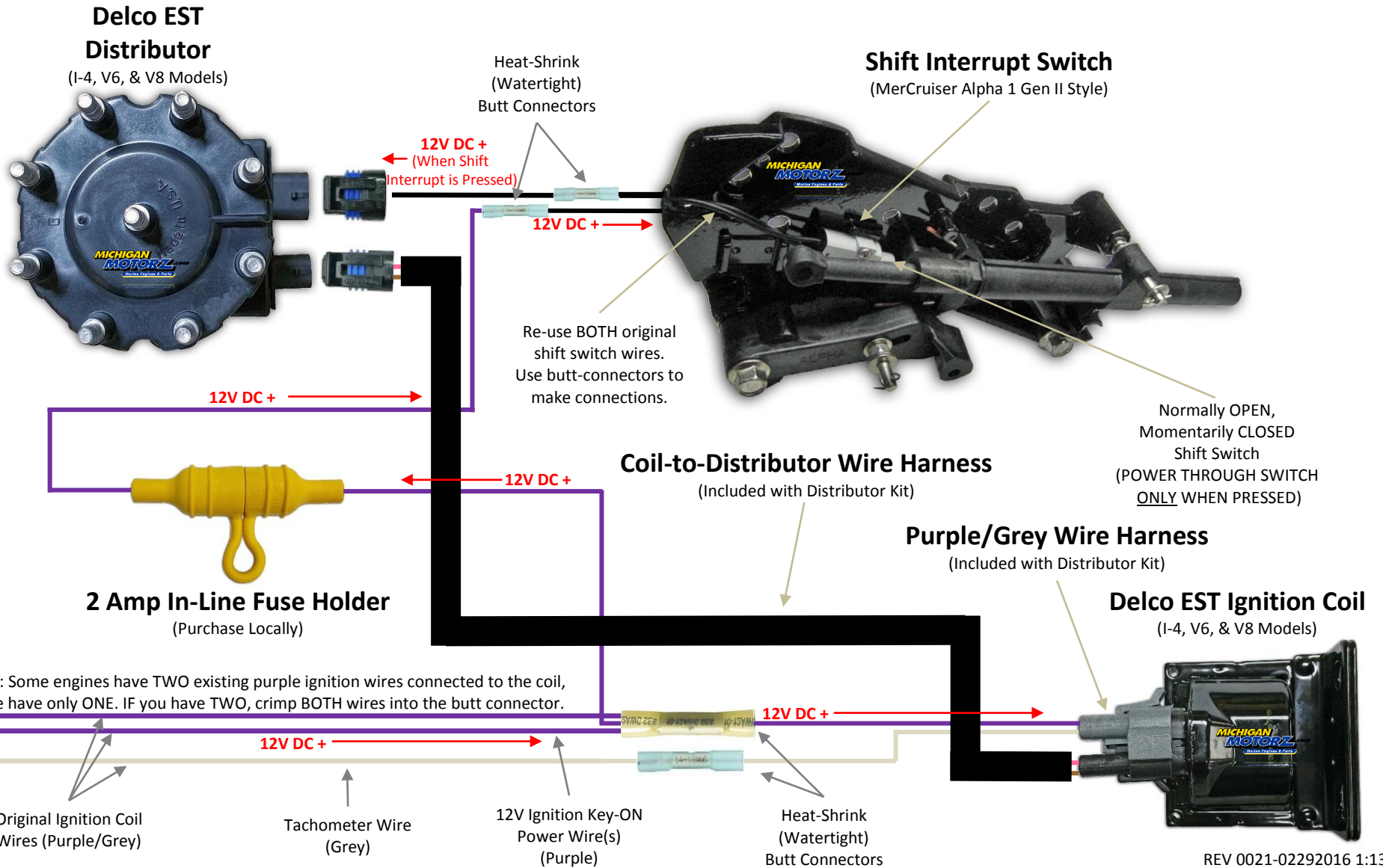
12V Ignition Key-ON
Power Wire(s)
(Purple)

Heat-Shrink
(Watertight)
Butt Connectors

12V DC +

12V DC +

Delco EST Distributor MerCruiser Shift Interrupt Wiring



Engine Break-In Procedures

Break-In Introduction

Taking the time and care to break-in your NEW or REMANUFACTURED marine engine is *very* important. When the engine is broken-in properly, your engine will last longer, run better, and require fewer repairs over its lifetime. Your engine does not require an elaborate break-in procedure, just a little care and common sense for the first few hours.

NOTICE: You MUST change your oil within the 10 hours of use.

Failure to do so WILL VOID WARRANTY.

Break-In Tips

- ALWAYS let the engine warm up to normal operating temperature before accelerating.
- Avoid fast accelerations and don't carry or pull a heavy load during this period.
- Check the engine oil frequently. During the 1st 50-100 hours, the engine can use more oil than usual. Maintain oil at proper level but be careful that you do NOT overfill the sump.
- Vary the boat speed during break-in. Do not run on the same RPM for very long.
- Observe gauge readings and check for loose mountings, fittings, nuts, bolts, and clamps.
- Report any abnormal operation, noises, or vibrations to Michigan Motorz as soon as possible.
- Re-torque exhaust riser (elbow) bolts after the first 20 minutes of operation, and again at the 5th hour of operation, and once again at the 10th hour of operation. See your engine service manual for proper torque requirements. Failure to do so may cause ruptured riser gaskets, leading to water ingestion, and void all applicable warranties.

Break-In Steps

1. For the 1st hour, do not exceed 2000 RPM and vary RPM continuously.
2. For the 2nd hour, do not exceed 3000 RPM.
3. For the next 5 hours, do not exceed 4000 RPM.

During the final 3 hours of engine break-in, and after warming the engine to normal operating temperature, it is permissible to operate at full throttle for five to ten minutes at a time. Momentarily reduce then increase engine speed to assist break-in of piston rings and bearings. Occasionally reduce engine speed to idle to provide cooling periods. After the break-in, your engine may be operated at any RPM within the limits for the engine.

Engine Break-In Procedures (*continued*)

Engine Oil Requirements

After the first 10 hours of operation, change your engine oil and oil filter and perform an engine checkup. If you do not know how to do this procedure, have a certified MARINE mechanic or your local boat dealer properly do this for you.

Michigan Motorz recommends using 15W-40 oil (SHELL Rotella-T 15W-40 Diesel Oil) meeting the API specifications of SJ/CH4/CG4 is acceptable. Synthetic oil that meets the API specifications of SJ/CH4/CG4 is acceptable to use AFTER 100 hours of operation with the recommended conventional oil.

NOTE: If you purchased a flat-tappet engine, we highly recommend using **LUCAS ZINC ADDITIVE** (or equivalent) for your oil during the engine break-in period, which can be purchased at most local auto-supply stores. This will greatly increase a flat-tappet engine lifespan and allow the engine to be broken-in properly. Please note zinc additives are *not* needed for roller cam engines.

Synthetic Oil

Synthetic oil that meets our requirements of 15W-40 SJ/CH4/CG4 is acceptable to use after 100 hours operation with the recommended conventional oil. The use of synthetic oil does not change the requirement of 50 hour oil change intervals.

Maintenance Requirements

Item	Service	First 10 Hours	Every 50 Hours	Every 100 Hours	300 Hours or Annually	Every 2 Years
Engine Oil and Filter	Change	X	X			
Spark Plugs	Replace				X	
Engine Timing	Check	X			X	
Spark Plug Wires	Inspect				X	
Engine Coolant*	Change					X
Fuel Filter*	Replace	X		X	X	
Flame Arrestor*	Clean			X		
Drive Belts*	Inspect	X		X	X	
Shaft Alignment*	Check	X			X	
Raw Water Impeller*	Inspect			X	X	
Breather Hose*	Clean				X	
PCV Valve*	Replace				X	
Starter Bendix*	Lubricate		X		X	

*Not Supplied by Michigan Motorz

Acceptance Of Warranty Terms. You, by the purchase of a product from Michigan Motorz, LLC (“Michigan Motorz”) that is covered by Michigan Motorz New Engine Limited Warranty Agreement (“Agreement”), denote your acceptance of the terms of conditions of this Agreement. The terms "You" or “Purchaser” means you the original purchaser of the product, your agents, beneficiaries, or heirs.

We warrant each new Michigan Motorz marine engine and accessories attached thereto (hereinafter collectively referred to as "product") manufactured by us to be free from defects in material and workmanship. Product models that have a compression ratio over 9.4:1 are not covered under this limited warranty. This warranty shall remain in effect for a period of **ONE (1) YEAR** from the date of shipment to you from Michigan Motorz or the date of pick-up by customer, whichever occurs first.

What is Covered by Warranty

Our obligation under this warranty shall be limited to repairing a defective part or, at our option, replacing such part or parts as shall be necessary to remedy any malfunction resulting from defects in material or workmanship as covered by this warranty. Replacement parts provided may be in new, remanufactured or used condition, at our discretion. Any repair or replacement will be covered under warranty for **NINETY (90) DAYS** or the remainder of the original warranty period, whichever is longer. We reserve the right to change or improve the design of any product without assuming any obligations to modify any product previously manufactured. All repairs or replacements **MUST** be approved in advance by Michigan Motorz in order for the repair or replacement to be covered under this Agreement.

Engine Replacement – Should Michigan Motorz determine that your engine needs to be replaced, Labor will be paid according to flat rate time at your current shop labor rate not exceeding \$65.00 an hour. Maximum labor time for marine engine replacement is 15 hours or \$850.00, whichever is less.

What is Not Covered by Warranty

Since this warranty applies to defects in material and workmanship, it does not apply to:

- Shop supplies used in performing warranty work (i.e. rags, sealants, lubricants, etc.)
- Incidental and consequential damages (storage charges, telephone or rental charges of any type, inconvenience or loss of time or income).
- Minor adjustments and tune-ups; including checking, cleaning or adjusting spark plugs, carburetor setting, filters, belts, controls and checking lubrication.
- Use of accessories or parts not manufactured or sold by Michigan Motorz.
- Failure caused by neglect, lack of maintenance, accident, abnormal operation, improper installation, improper preparation, improper winterization, improper dealer set-up or improper service or normal wear and tear.
- Failure of the installer to run-test the engine prior to installation and all costs and charges associated with removal, repair, or reinstallation of any such engine that was installed without first being run tested.
- Haul-out, launch, towing charges, removal and /or replacement of boat partitions or material because of boat design for necessary access to the Product. Reasonable access must be provided to the product for warranty service.
- Transportation charges and/or travel time.
- Service requested by customer other than that necessary to satisfy the warranty obligation.
- Oils, lubricants or fluids used in normal maintenance.
- Participation in or preparing for racing or other competitive activity.
- Any action that will change the intended use of the product or that will affect the product's operation
- Alteration or removal of parts or accessories.
- Starter motors and/or armatures or field coil assembly, which have been damaged from excessive cranking, condensation, or submersion.
- Water entering the engine via the intake or exhaust system or submersion.
- Use of fuels and lubricants that are not suitable for use with or on the product.
- Failure of any parts caused by lack of cooling water which results from starting motor out of water or foreign materials blocking intake passages.
- Air freight, next-day or second-day air, or any special delivery fees, unless authorized by Michigan Motorz prior to ordering of parts.
- Certain parts may be tested on receipt by Michigan Motorz. Parts found to be free of defects will be returned to the dealer and no credit will be issued. If the part has already been credited, the dealer account will be debited.

WARRANTY DISCLAIMER AND LIMITATION OF LIABILITY

EXCEPT FOR THE WARRANTIES EXPRESSED IN THIS AGREEMENT, MICHIGAN MOTORZ DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE TOTAL LIABILITY, IF ANY, OF MICHIGAN MOTORZ AND THAT OF ITS OFFICERS, DIRECTORS, SHAREHOLDERS, AGENTS AND EMPLOYEES TO PURCHASER FOR DAMAGES WITH RESPECT TO THIS AGREEMENT AND THE ENGINE OR PARTS SOLD TO YOU SHALL NOT EXCEED THE PURCHASE PRICE RECEIVED FOR PRODUCTS OR SERVICES RENDERED. IN NO EVENT SHALL MICHIGAN MOTORZ, ITS OFFICERS, DIRECTORS, SHAREHOLDERS, AGENTS, AND EMPLOYEES HAVE ANY LIABILITY FOR PUNITIVE, EXEMPLARY, INCIDENTAL, CONSEQUENTIAL, OR SPECIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST PROFITS OR REVENUES. THE LIMITATIONS AND EXCLUSIONS IN THIS PARAGRAPH SHALL APPLY TO ALL CLAIMS OF EVERY NATURE, KIND AND DESCRIPTION, WHETHER ARISING FROM BREACH OF CONTRACT, BREACH OF WARRANTY, STRICT LIABILITY, NEGLIGENCE OR OTHER TORT, OR OTHERWISE. DAMAGES AS LIMITED BY THIS PARAGRAPH IS PURCHASER'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT THAT ANY OTHER REMEDY PROVIDED IN THIS AGREEMENT FAILS OF ITS ESSENTIAL PURPOSE.

Michigan Motorz's obligation under this warranty is strictly and exclusively limited to the repair and replacement of defective parts, and Michigan Motorz does not assume or authorize anyone to assume from them any other obligation. There are no warranties which extend beyond the description hereof.

Note: In the event that a warranty claim is required outside the continental United States with the exception of Alaska and Hawaii, there may be additional charges not covered under warranty based on local practices and conditions, such as but not limited to freight, insurance, taxes, license fees, import duties and any and all other financial charges, including those levied by governments, states, territories, and their respective agencies which will be the responsibility of the purchaser.

How Do You Get Service?

In order to be eligible for service under this warranty you MUST fill out and return the warranty registration card and checklist attached below within 30 days of the engine being shipped to you in order for you to be eligible for service coverage under this Warranty.

Warranty Claim Procedure

A claim shall be made under this warranty by contacting Michigan Motorz for a Return Material Authorization (RMA) number. Once you have received the RMA, you are to deliver the product for inspection to Michigan Motorz or authorized Michigan Motorz dealers authorized to service the product. Michigan Motorz shall then arrange for the inspection and repair, provided such service is covered under this warranty. Michigan Motorz in its sole discretion may determine if the claimed fault or repair requested is covered by this warranty. You are responsible for properly packaging your product, paying all shipping costs, loss or damage to the product during shipping, and any other taxes, fees or charges associated with transporting the product to Michigan Motorz. Further, if the service is not covered by this warranty, purchaser shall pay for all related labor and material. Any product or parts shipped by purchase for inspection or repair must be shipped with the transportation charges prepaid to Michigan Motorz.

If you require a new part immediately and cannot wait for the product to be inspected by Michigan Motorz, You agree to pay a deposit equal to the value of the replacement part(s) shipped to you to be held until the claimed defective part(s) can be inspected by Michigan Motorz. You agree that this deposit will be applied in full to pay for the cost of the new part should Michigan Motorz examine the returned part and determine, in its sole discretion, that it is not defective.

The owner's bill of sale with the date of purchase is the only valid registration identification and must be presented at the time warranty service is required.

Additional Terms and Conditions

DISPUTE RESOLUTION. You agree that any Dispute between You and Michigan Motorz will be resolved exclusively and finally by arbitration administered by the American Arbitration Association (AAA) and conducted under its rules, except as otherwise provided below. The arbitration will be conducted before one arbitrator in accordance with the Federal Arbitration Act 9 USC 1 etseq, and will be limited solely to the Dispute between You and Michigan Motorz. All statute of limitations that would otherwise be applicable in a judicial action brought by a party will apply to the arbitration. In the arbitration, the parties agree that the law for the State of Michigan shall apply. The arbitration shall be in Madison Heights, Michigan. Any decision rendered in such arbitration proceedings will be final and binding on each of the parties, and judgment may be entered thereon in any court of competent jurisdiction. Should either party bring a Dispute in a forum other than AAA, the arbitrator will award the other party its reasonable costs and expenses, including attorneys' fees, incurred in staying or dismissing such other proceedings or in otherwise enforcing

compliance with this dispute resolution provision. You understand that you would have had a right to litigate disputes through a court, and that you have expressly and knowingly waived that right and agreed to resolve any Disputes through binding arbitration. For the purposes of this section, the term "Dispute" means any dispute, controversy, or claim arising out of or relating to (i) this Agreement, its interpretation, or the breach, termination, applicability or validity thereof, or (ii) the purchase or use of any product, accessory, service or otherwise from Michigan Motorz. Information may be obtained from the AAA on line at <http://www.adr.org/>, by calling 1-800-778-7879 or writing to 1633 Broadway, 10th Floor New York, New York 10019.

Choice of Law and Venue. This Agreement is governed by the laws of the State of Michigan, without giving effect to conflicts of law rules. You agree that if any dispute is found not to be subject to the Dispute Resolution clause, that the sole venue will be that of the court with the appropriate jurisdiction in Oakland County, Michigan and you agree that you are subject to and agree to submit to the personal jurisdiction of the appropriate court in Oakland County, Michigan.

Transferability. This warranty covers the **original purchaser only** and is **non-transferable**. You may not assign, delegate, or transfer this warranty.

Severability. If any provision, paragraph or subparagraph of this Agreement is adjudicated by any Court to be void and unenforceable in whole or in part, such adjudication shall not be deemed to affect the validity of the remainder of the Agreement, including any other provision, paragraph or subparagraph. Each provision, paragraph or subparagraph of the Agreement is declared to be separable from each other provision, paragraph or subparagraph and constitutes a separate, distinct covenant.

Modification and Waiver. No waiver or modification of the Agreement shall be valid unless it is in writing and signed by Michigan Motorz. Furthermore, any waiver by either party of any breach of any provision of this Agreement shall not operate or be construed as a waiver of any subsequent breach.

Third Party Beneficiaries. This Agreement will not confer any rights or remedies on any third party, other than the parties to this Agreement and their respective successors and permitted assigns.

Titles. Titles and headings to articles, sections, or paragraphs in this Agreement are inserted for convenience of reference only and are not intended to effect the interpretation or construction of the agreement.

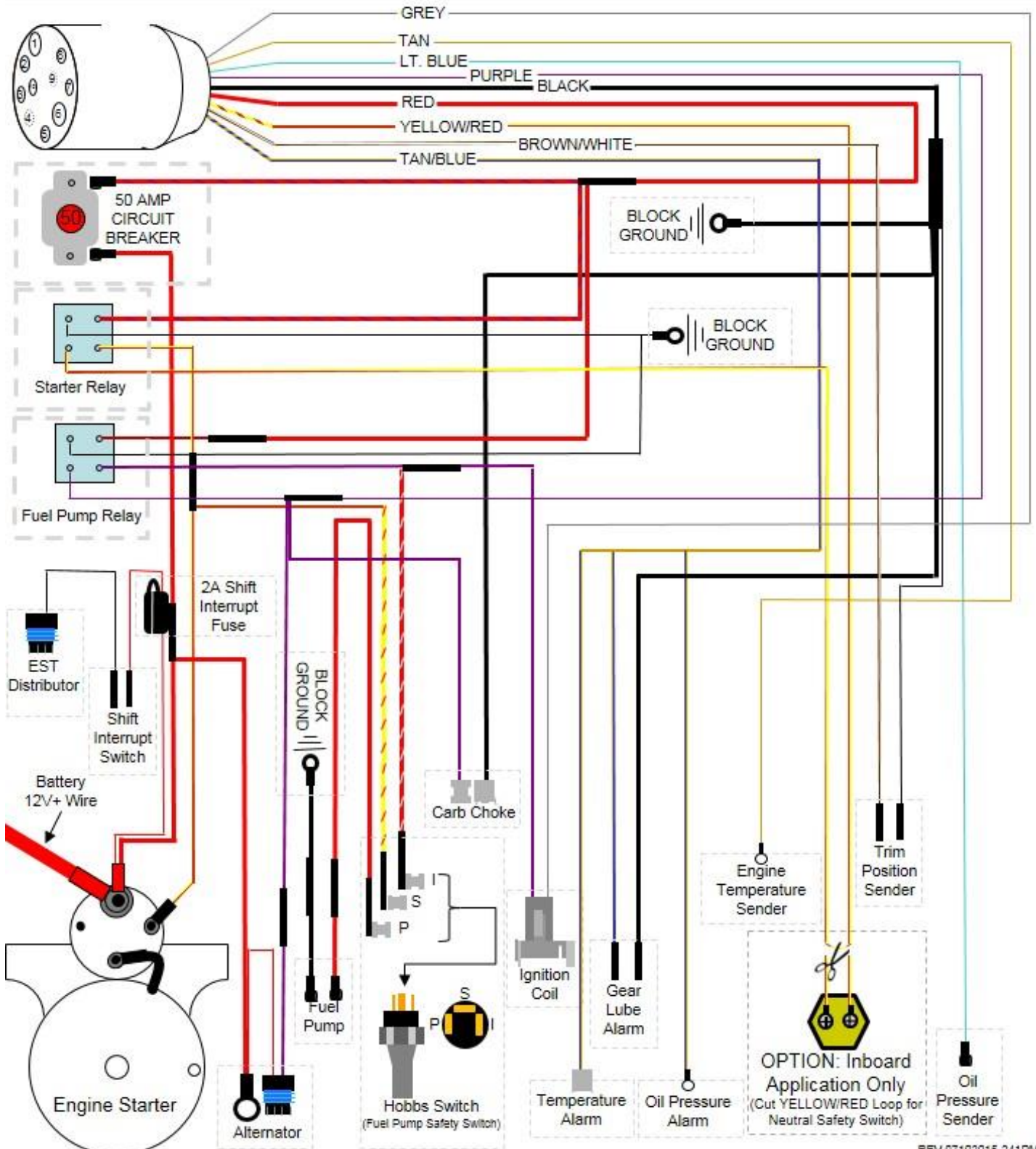
Entire Agreement. This Agreement contains the entire understanding of the parties involved and supersedes all previous oral and written agreements with regard to subject hereof.

GOLD PACKAGE WIRING DIAGRAM



- 1. Ground - **Black**
- 2. Tachometer - **Grey**
- 3. Water Temperature - **Tan**
- 4. Engine Warning - **Tan/Blue**
- 5. Ignition - **Purple**

- 6. Battery - **Red**
- 7. Starter Solenoid - **Yellow/Red**
- 8. Oil Pressure - **Blue**
- 9. N/A
- 10. Trim Senders - **Brown/White**



4.3L OMC/Volvo Penta Coupler Warning



PLEASE READ CAREFULLY PRIOR TO INSTALLATION (4.3L Engines Only)

Michigan Motorz is making the engine installer aware of an issue when installing an “Old Style” Volvo Penta Coupler for an Inboard/Outboard application to the Barr 4.3L Engine. The Volvo “Hub” style coupler attached to the center of the flywheel (using the flywheel bolts of replacement studs).

The current production 4.3L engine from GM has an area of the crankshaft the sticks out past the flywheel outer surface (about .050”). The extra portion of the crank shaft sticking out does not allow the OMC/Volvo style coupler to fit snug against the flywheel (like it was originally designed to do). In this case, the coupler feels tight with a wrench but will allow the flywheel the move back and forth on its mounting bolts or studs thus causing a knocking noise during engine operation.

When installing the 4.3L engine into an older Volvo I/O application, please make sure this extra portion of the crankshaft (flywheel end) does not interfere with the coupler after installation. If you experience this problem, please contact Michigan Motorz soon as possible to purchase a new style coupler.

Michigan Motorz would also like to note that this is a design change from General Motors and is the same for all 4.3L engines of this model, regardless of the OEM Manufacturer (OMC, Volvo Penta, etc).

The cost of the replacement coupler (or any other needed parts) and/or the labor to remove and replace any portion thereof, including the engine will not, under any circumstances, be covered under the manufacturer of this products ‘warranty.

Please feel free to contact Michigan Motorz if you have any questions of concerns regarding this matter. We appreciate your support. Enjoy your new engine!



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www.michiganmotorz.com
sales@michiganmotorz.com

Hours of Operation:

Monday-Friday: 9am-5pm EST
Saturday (Summer Hours): 9am-1pm EST
Saturday (Winter Hours): Call Ahead Friday to
Schedule Pickups