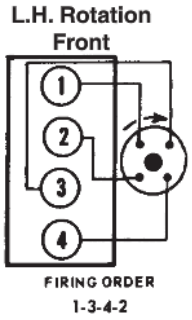
Marine Engines 4 Less Installation Tech Tips & FAQ's

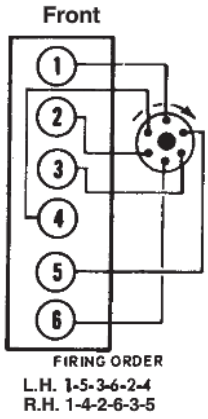
Note: These technical tips and recommendations have been compiled from a variety of sources including Marine Engines 4 Less' service technicians. While we stand by this information 100%, we always recommend that you follow your engine service manual provided by your original engine manufacturer. We are not responsible for any incorrect information provided in the following technical tips and information.

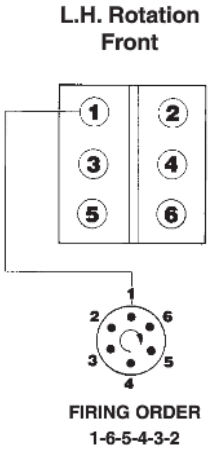
Thank you for purchasing a new or remanufactured marine engine from Marine Engines 4 Less. You won't be disappointed! We've compiled this list of helpful information that the installers of our engines may find useful.

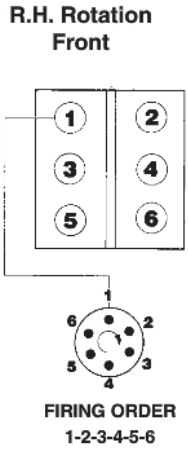
Marine Engines Firing Order

Chevy

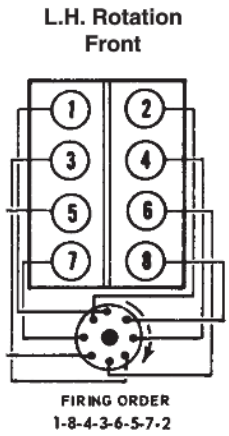


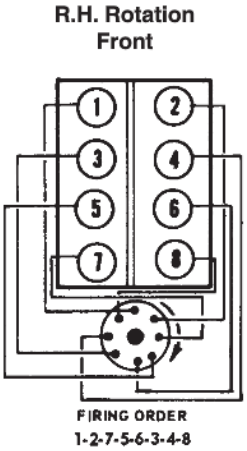


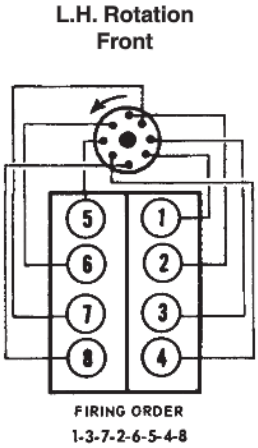


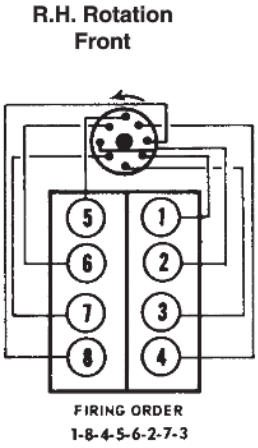


Chevy — Ford

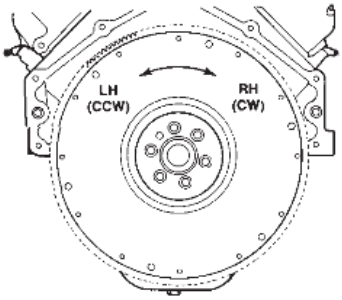








Engine Rotation



Engine Rotation

Engine rotation is identified as "RH" (right-hand) or "LH" (left-hand) by the model number. Rotation always is determined from the flywheel end of the engine. In some instances, propeller shaft rotation may be opposite to that of the engine. Always refer to engine model number for engine rotation. When ordering a replacement engine, short blocks or parts for an engine, be certain to check engine rotation. Do not rely on propeller rotation in determining engine rotation.

Rocker Arm/Push Rod Adjustment – Engine Stopped GM V6 & V8

With valve cover removed, adjust valves when lifter is on low part of camshaft lobe, as follows:

1. Crank engine with starter, or turn over in normal direction of rotation until mark on torsional damper lines up with "TDC" mark on the timing tab, and engine is in No. 1 firing position. This may be determined by placing fingers on No. 1 valve as mark on damper comes near "TDC" mark on timing mark. If valves move as mark comes up to timing tab, engine is in No. 6 firing position on V-8 and No. 4 firing position on V-6 and should be turned over once more to reach the No. 1 position.

2. With engine in No. 1 firing position, as determined above, the following valves may be adjusted (See Figure 1).

3. Back out adjusting nut until lash is felt at push rod, then turn in adjusting nut until all lash is removed. This can be determined by moving push rod up and down while turning adjusting nut until all play is removed.

4. Hydraulic lifters now can be adjusted by tightening adjustment nut 3/4 of an additional turn. No other adjustment is required.

5. Crank engine one revolution until "TDC" pointer mark and torsional damper mark are again in alignment. This is No. 6 firing position on V-8 and No. 4 firing position on V-6. With engine in this position, the following valves may be adjusted (See Figure 2).

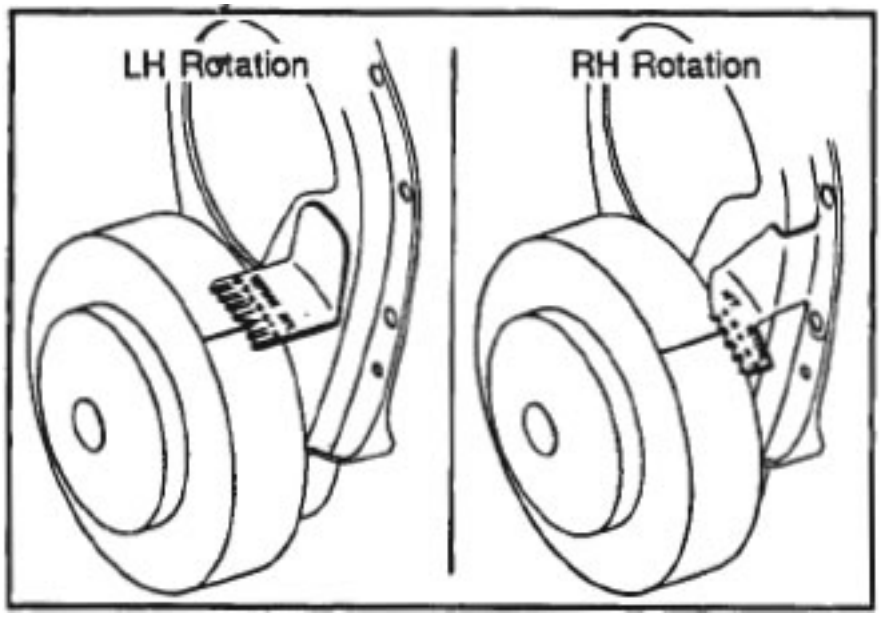


Figure No. 1: Engine in No. 1 Firing Position

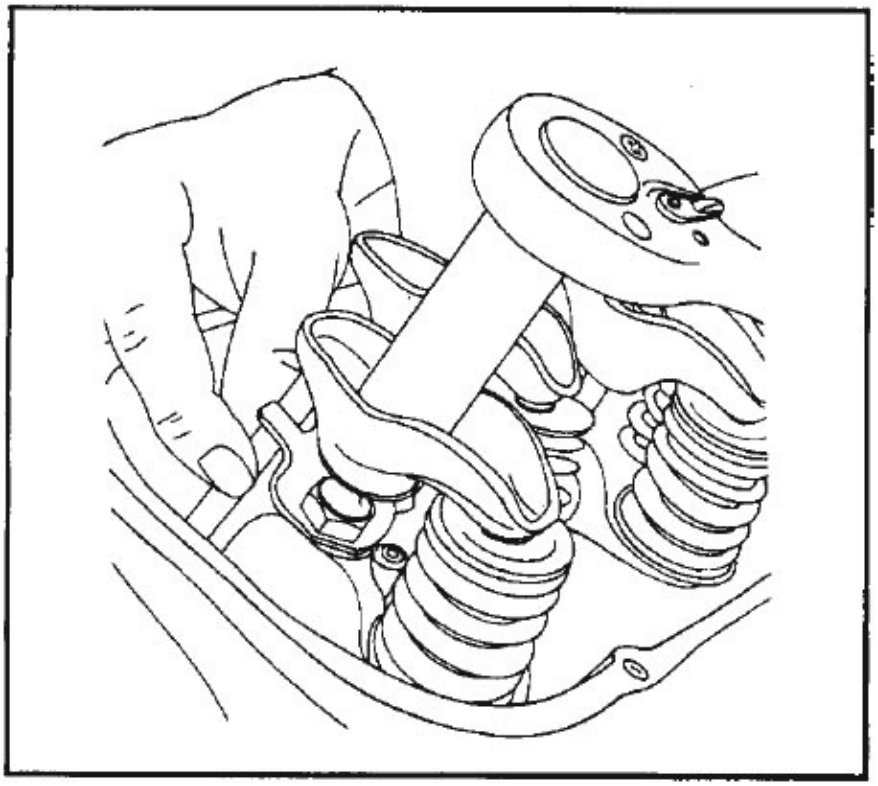


Figure No. 2

FOR V-8

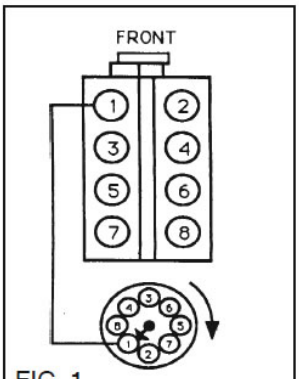


FIG. 1

With number ONE cylinder at TDC of compression stroke, adjust the following rocker arms.

Left-hand (normal) rotation engine	Right-hand rotation engine
Exhaust 1, 3, 4, 8 Intake 1, 2, 5, 7	Exhaust 1, 2, 5, 7 Intake 1, 3, 4, 8

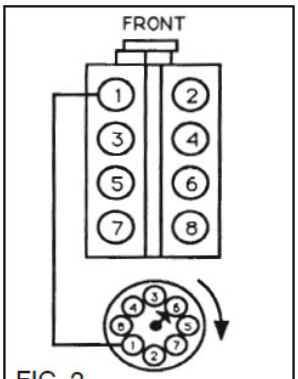


FIG. 2

With number SIX cylinder at TDC of Compression stroke, adjust the following rocker arms.

Left-hand (normal) rotation engine	Right-hand rotation engine
Exhaust 2, 5, 6, 7 Intake 3, 4, 6, 8	Exhaust 3, 4, 6, 8 Intake 2, 5, 6, 7

FOR V-6

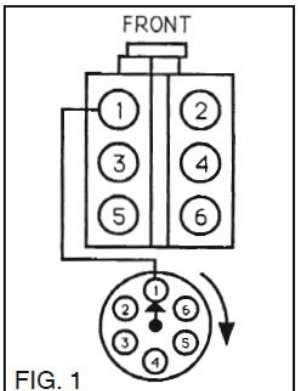


FIG. 1

With number ONE cylinder at TDC of compression stroke, adjust the following rocker arms.

Left-hand (normal) rotation engine	Right-hand rotation engine
Exhaust 1, 5, 6 Intake 1, 2, 3	Exhaust 1, 2, 3 Intake 1, 5, 6

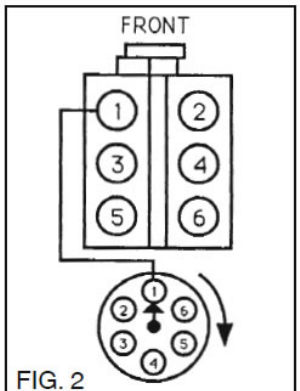


FIG. 2

With number FOUR cylinder at TDC of Compression stroke, adjust the following rocker arms.

Left-hand (normal) rotation engine	Right-hand rotation engine
Exhaust 2, 3, 4 Intake 4, 5, 6	Exhaust 4, 5, 6 Intake 2, 3, 4

Engine Alignment for I/O Applications

Proper engine alignment is a crucial part of extending engine coupler life. Periodic inspection of the engine and outdrive should be done at least once a year and after each engine or drive R & R.

Most outdrives are coupled to the engine via an "engine coupler". This is an internally splined receptacle mounted in a rubber hub that aids in protecting the engine from outdrive impact and vibration. The coupler bolts to the flywheel and accepts the outdrive "Yoke Assembly". It is very important that these two items are centered exactly on the engine crankshaft center line (fig. 1). This will insure that there isn't any excessive force being applied in a lateral direction causing premature wearing of the coupler splines, yoke assemble splines or the coupler.

Proper alignment can be achieved with the use of an "Alignment Tool" using the following guidelines:

Insert the tiered end into the gimbal bearing and move the tool to center with the engine coupler splines. If the tool enters the coupler freely and is fully seated in the coupler without any pressure (fig 2.), the engine is properly aligned.

If this is not the case, remove the tool and coat the end with a small amount of grease. Carefully reinsert the tool and fully seat the tool in the coupler. "Careful - Do Not Rotate Tool Upon Installation Or Removal". Remove the tool and inspect the greased end.

The following should be noted:

A: Deep groves on top of tool and shallow groves on bottom, then FRONT of engine is too HIGH.

B: Shallow groves on top of tool and Deep groves on bottom, then FRONT of engine is too LOW.

In either case the front of the engine must be adjusted up or down to allow the tool to slide freely into the coupler. Loosen lock tabs and nuts on front mount(s). Thread all adjustment nut(s) equally. This will help prevent "cocking" the front of the engine. After proper alignment is achieved, tighten all nut and replace locking tabs.

If alignment can not be achieved, check for: Worn or bad mounts Rotten stringers Bad or weak transom Reinstall the outdrive by coating the yoke assembly with grease and using the proper gasket set. Torque all nut and bolt to factory specs and your customer should receive years of boating pleasure.

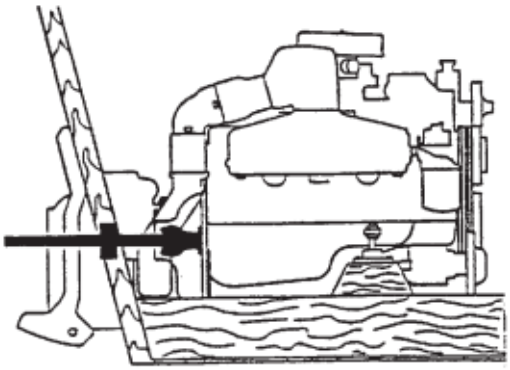


Fig. 1

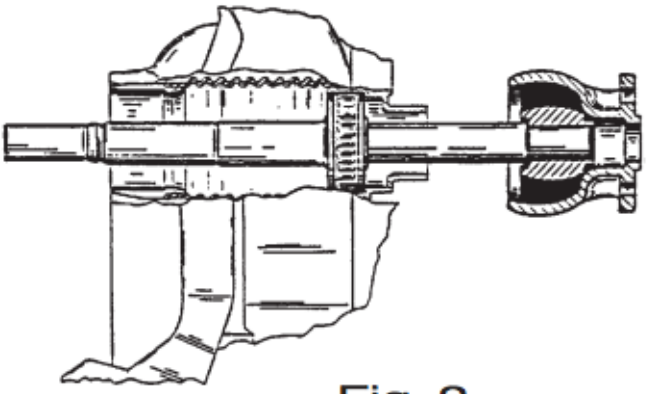


Fig. 2

Inboard Engine Alignment

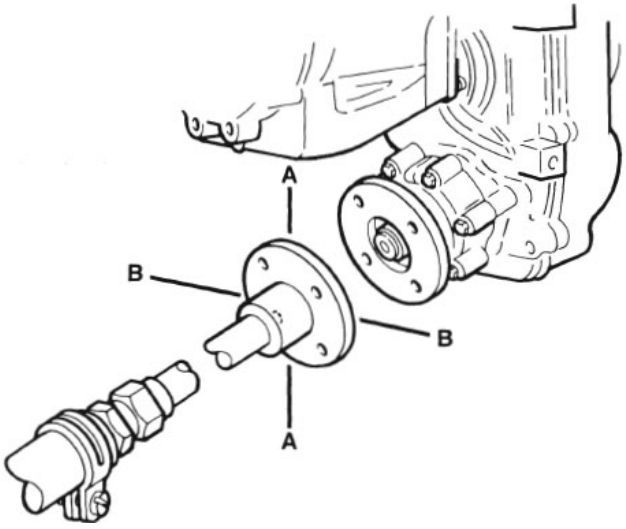
IMPORTANT: Engine alignment MUST BE RECHECKED with boat in the water, fuel tanks filled and with a normal load on board.

Engine must be aligned so that transmission and propeller shaft coupling centerlines are aligned and coupling faces are parallel within .003" (0.07 mm). This applies to installations with solid couplings, as well as flexible couplings.

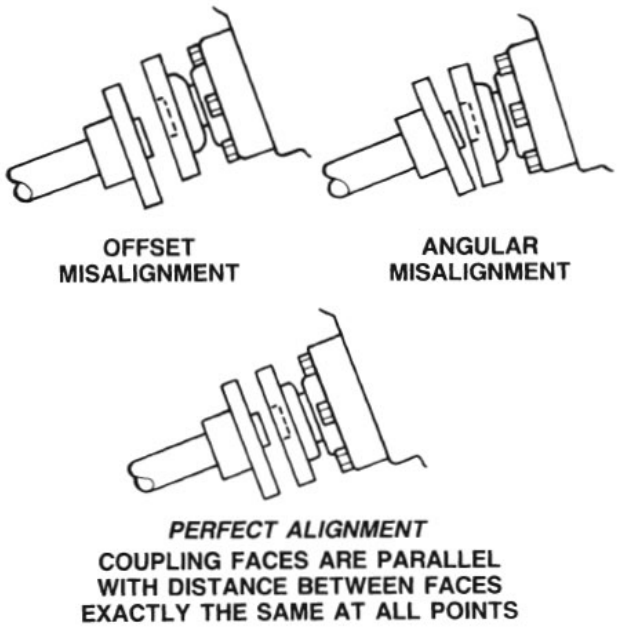
1. Check mating faces on transmission and propeller shaft couplings to make sure they are clean and flat.

2. Center the propeller shaft in the shaft log as follows:

- Push down and then lift the propeller shaft as far as it will move, then place the shaft in the middle ofthe movement.
- Move the shaft to the port and then to starboard as far as the shaft will move, then place the shaft in the middle of this movement.
- With the shaft in the center of the shaft log, align the engine to the shaft.

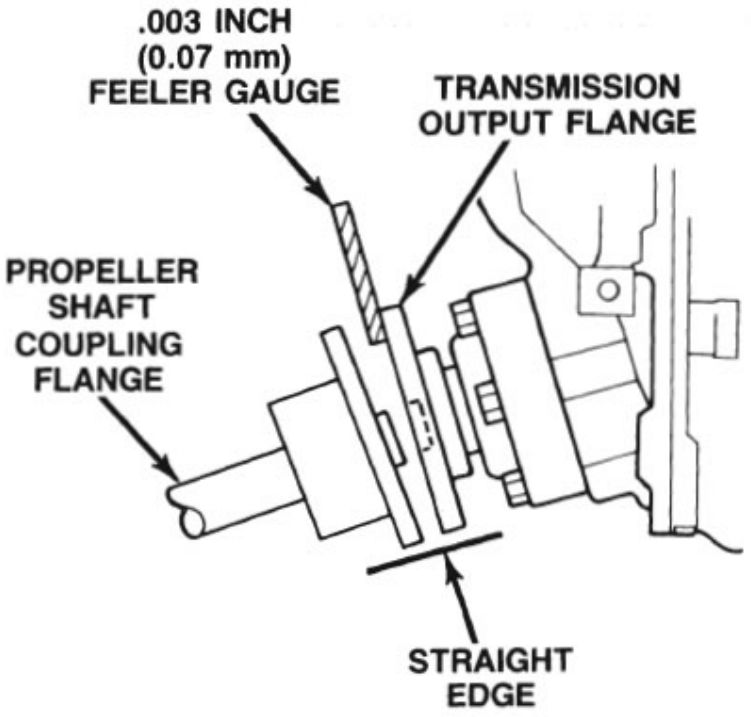


3. Check that coupling centerlines align by butting propeller shaft coupling against transmission coupling. (Figure 2) Shoulder on propeller shaft coupling face should engage recess on transmission coupling face with no resistance.



Note: Some propeller shaft couplings may not have a shoulder on mating face. On these installations, use a straight edge to check centerline alignment.

4. Check for any angular misalignment. Hold coupling faces tightly together and check for a gap between coupling faces with a .003" (0.07 mm) feeler gauge at 90-degree intervals (Figure 3).



Frequently Asked Questions

What type of oil do I use?
We recommend 15W40 Pennzoil Marine Oil or 20W50 if you can't find 15W40.

What oil filter do you recommend?
We recommend the following Fram Oil Filters:

- 3.0L – PH30
- 4.3L Pre-Vortec – PH3980
- 4.3L Vortec – PH3980
- V8 SB – PH30
- V8 BB – PH30

What is the oil capacity of my engine?

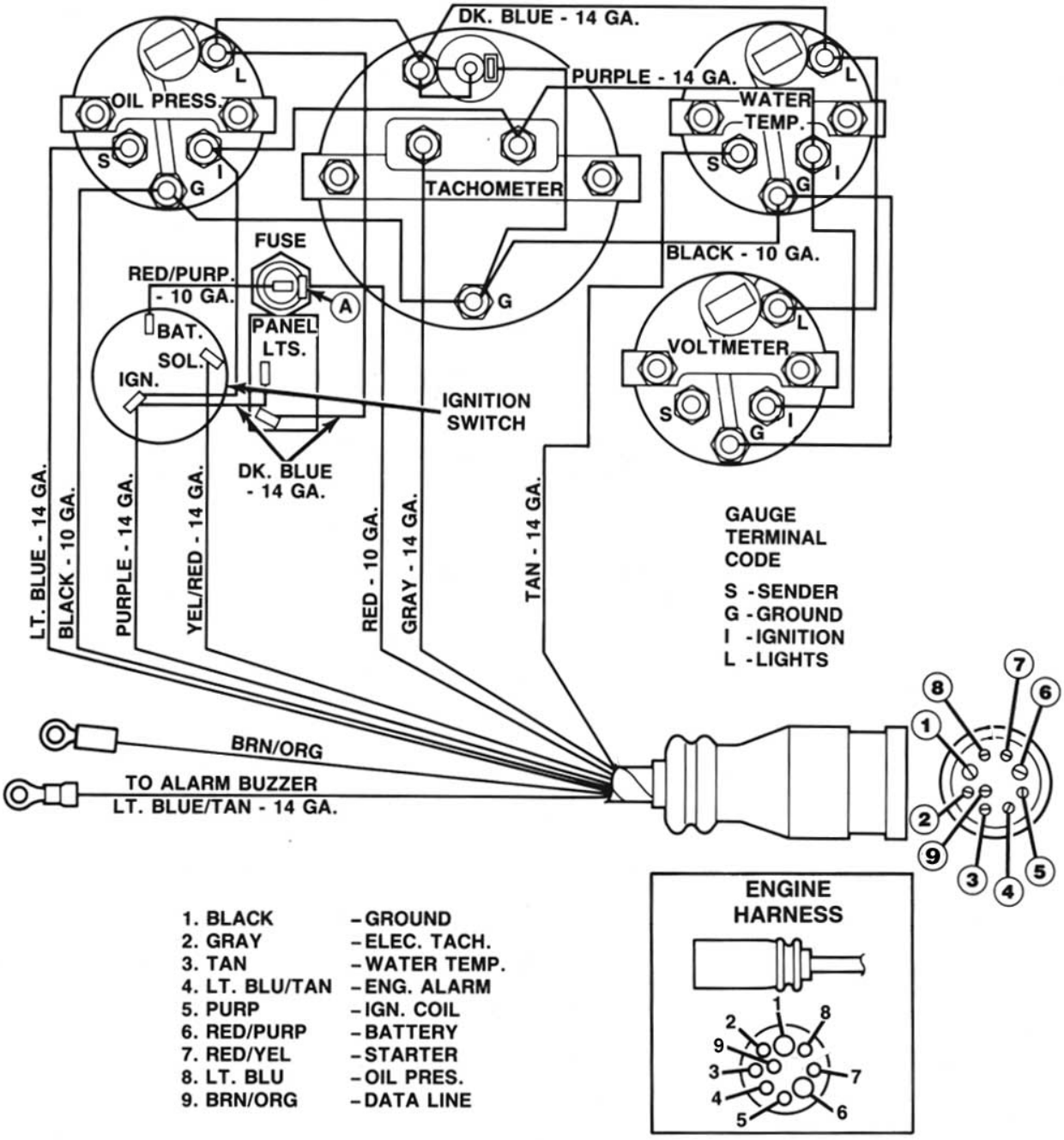
- 3.0L – 4 quarts of oil without filter
- 4.3L Pre-Vortec – 4.5 quarts without filter
- 4.3L Vortec – 4.5 quarts without filter
- 5.0L Vortec – 5.5 quarts with filter
- 5.7L Vortec – 5.5 quarts with filter
- 6.2L Vortec – 5.5 quarts with filter
- 7.4L – 8 quarts with filter
- 8.2L – 8 quarts with filter

How do I wire my instrumentation?
See page 9 of this packet.

How do I time my ignition?
If you are using the Delco Voyager ignition system (all of our extended base engines or complete engines go out with this type of ignition), please visit:
https://marineengines4less.com/images/companies/1/EST Ignition Instructions - ME4L.pdf?1431462059320

For any other ignition, such as a Thunderbolt, EFI or MPI ignition system, please consult your owner's manual.

Instrumentation Wiring



NOTE: ENGINE HARNESS WIRED FOR PANELS USING VOLTMETERS ONLY.

NOTE A: POWER FOR A FUSED ACCESSORY PANEL MAY BE TAKEN FROM THIS LOCATION. LOAD CANNOT EXCEED 30 AMPS.