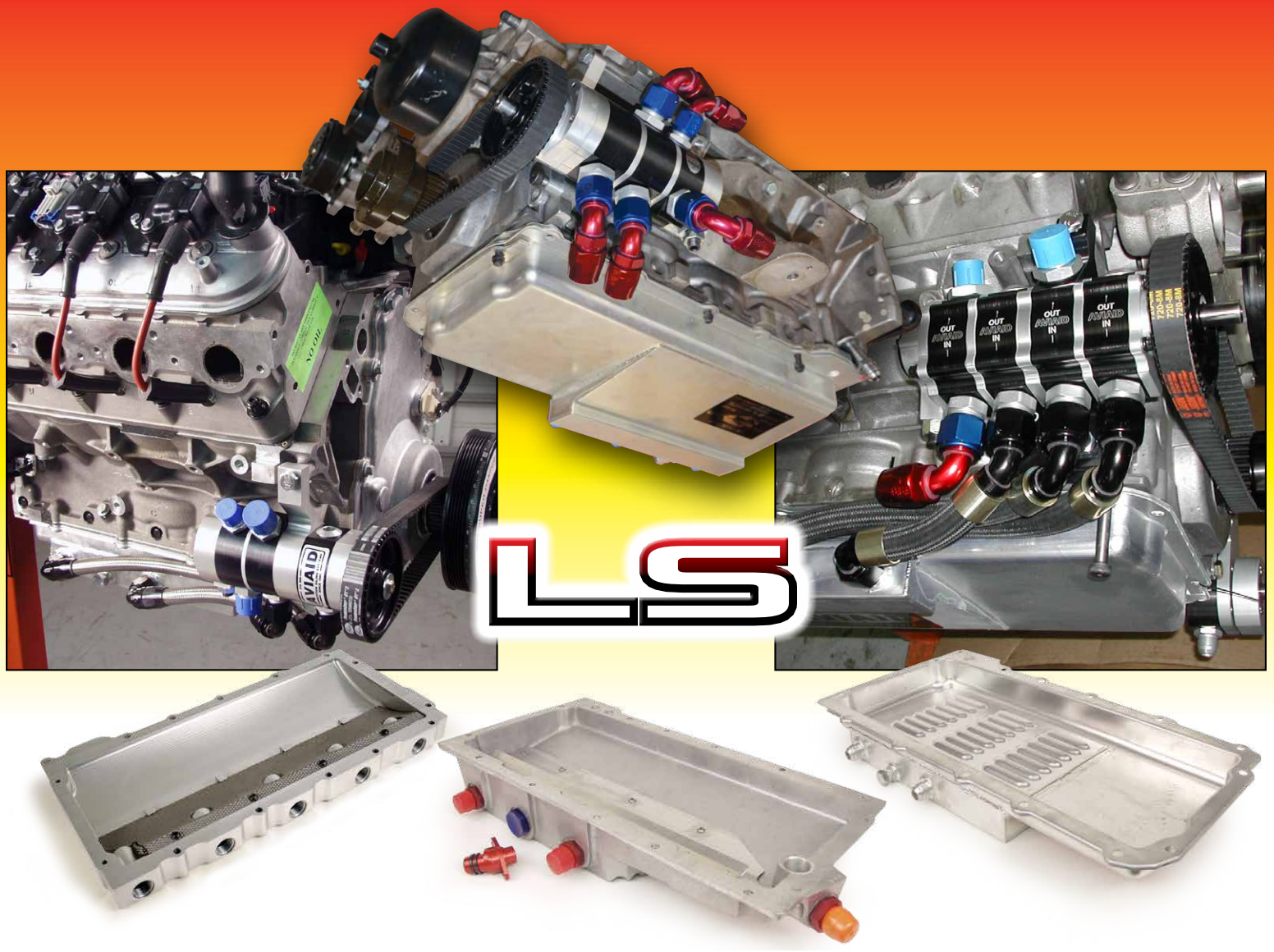
AVIAID

DRY SUMP OIL SYSTEMS FOR GM LS-SERIES ENGINES



- Direct block mounts and suspended (adjustable)
- Right and Left side mounts available
- Three drive belt options (cogged or serpentine)
- Drive pulley in front or rear of balancer

Systems For All 1997-2015 GM Vehicles With LS-Series Engines

INTRODUCTION TO SERIES 1 PUMPS

Today's Aviaid Series 1 pump has evolved through over 40 years of refinement and embodies a number of design, material and manufacturing enhancements. That said, many Aviaid pumps that were sold ten, twenty or even thirty years ago are still in service—a testament to their performance and reliability.

The Series 1 pump features a compact housing design and a 9-tooth gearset. They are available with one through seven sections—although 1 through 4 are the most popular. The sections are made of aluminum with optional cast iron pressure sections. Sections are offered in seven widths (0.600", 0.840", 1.000", 1.250", 1.500" 1.750" and 2.000"). Lead alloy gears are standard. It can be configured to use as either an external wet sump or dry sump pump.

Mounting blades are incorporated as section spacers for many applications. This provides for more rigid mounting than those competitors' systems with mounts that bolt to the spacers. There are six additional mounting options, including cam drive, gear drive, direct-to-block, universal side-mount, alternator mount or generic front flange with or without registers.

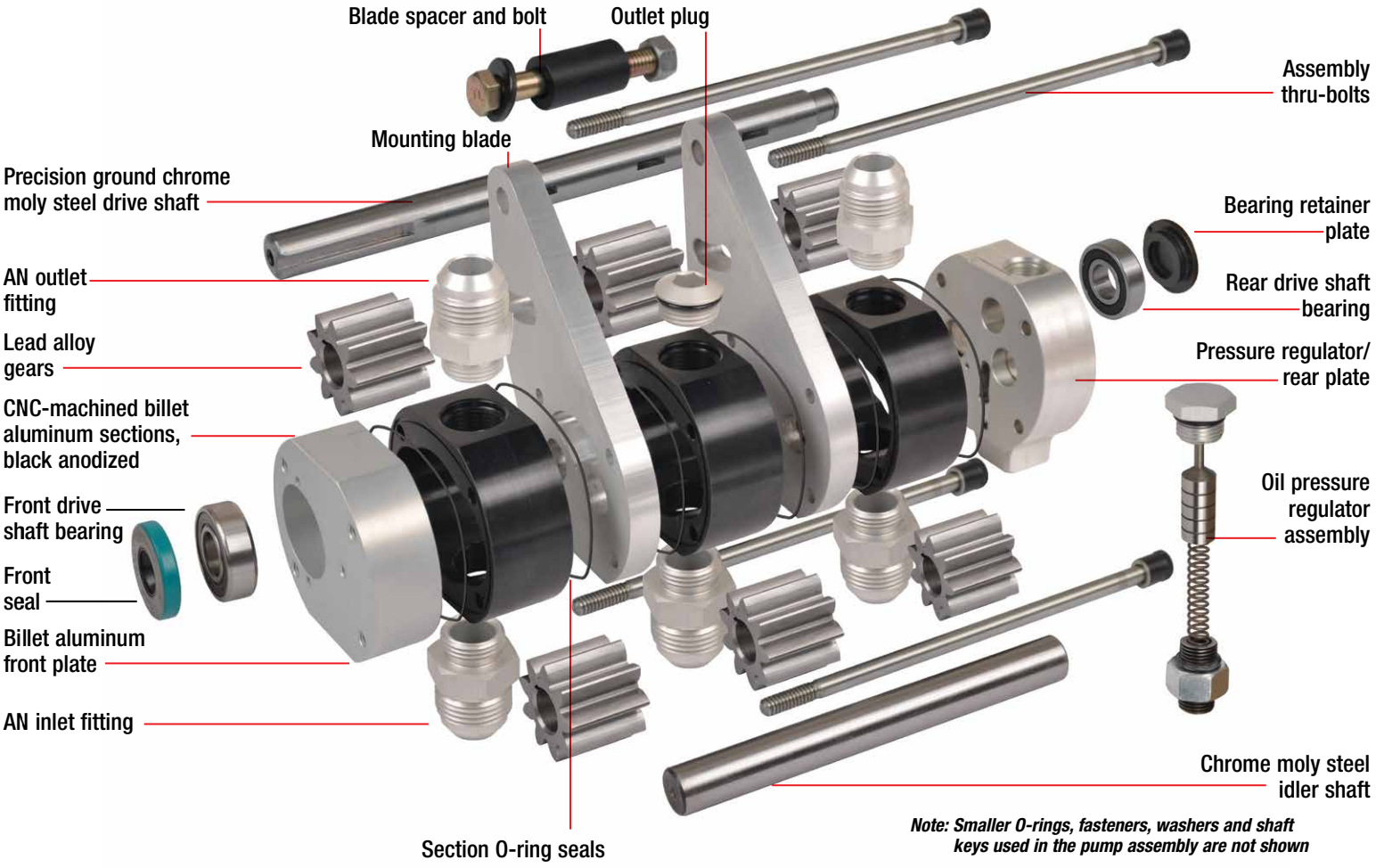
Drive and idler shafts are precision ground chrome moly steel, with the drive shaft available with a 3/16" belt drive keyway, 3/8", 7/16" or 1/2" hex, or 1/4" tang drives. The drive shaft runs on precision roller bearings; the idler shaft is fixed in the pump. Most Aviaid pumps have built-in pressure regulators, with remote-mounted regulators as an option.

Series 1 Pump cross-section
Note the interlocking 9-tooth gears and compact housing design.

Aviaid's modular design is the key to flexibility and allows pumps to be configured to for most any application from a small displacement 4-cylinder pushrod engine to a huge twin-turbocharged V-8 (or larger) powerplant.

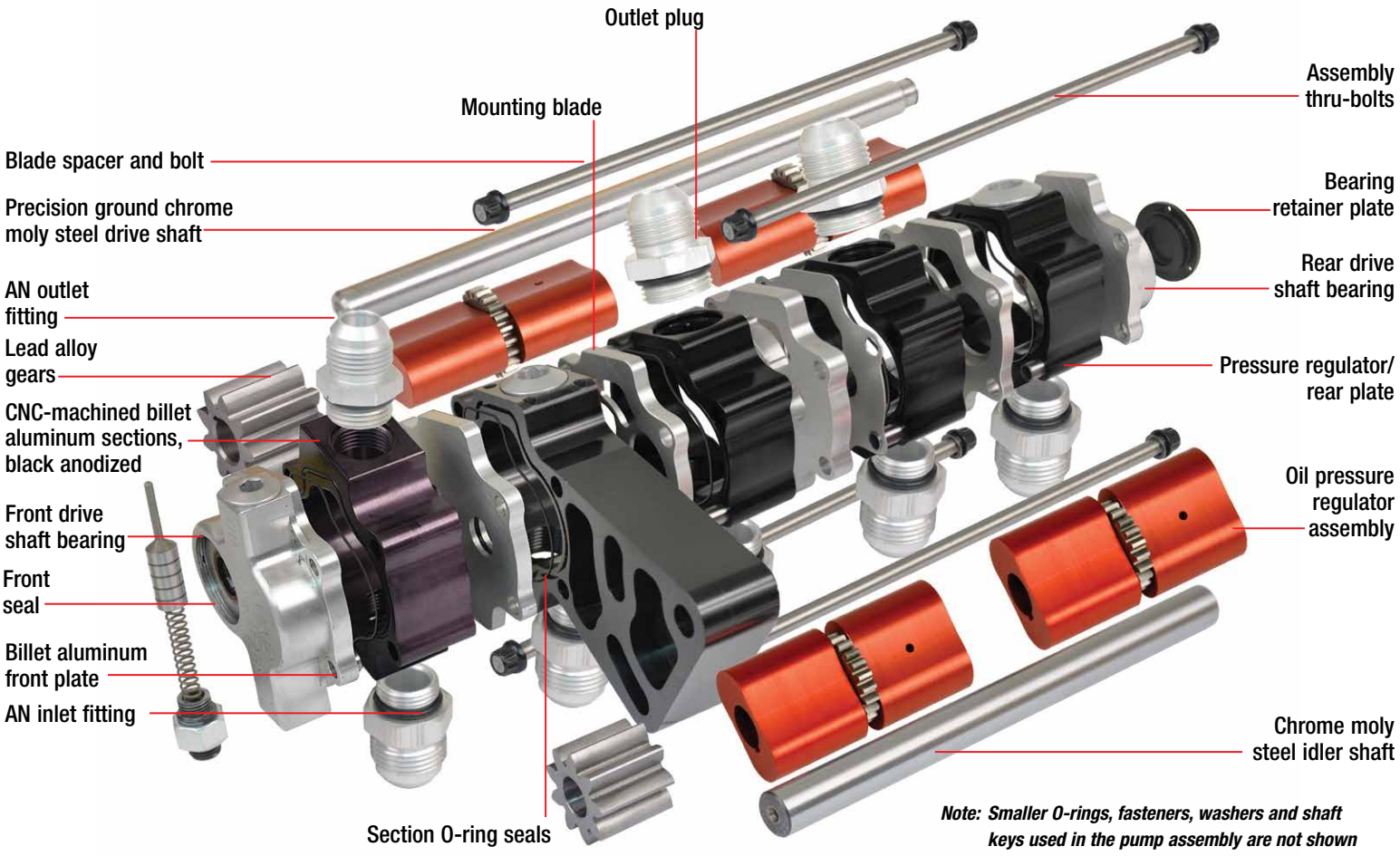
Due to the myriad modifications that can be employed on sophisticated all-out racing engines, it's more advantageous to go with a custom (bespoke) pump configuration. It's a delicate balance of how much volume and oil pressure an engine requires in concert with scavenging and evacuation. And the experts at Aviaid know how to work with engine builders to configure the optimum pump and lubrication system.

Components used in typical Aviaid Series 1 pump assembly



Note: Smaller O-rings, fasteners, washers and shaft keys used in the pump assembly are not shown

Components used in typical Aviaid Series 2 pump assembly



Note: Smaller O-rings, fasteners, washers and shaft keys used in the pump assembly are not shown

SERIES 2 PUMPS

Aviaid's Series 2 pumps were developed to provide racers with a compact, highly efficient pump that is ideally suited for use in tight confines; the inlet and outlet ports are angled 28° to provide excellent hose/fitting clearance. The outlet ports are directed away from the cylinder heads and steering, while the inlet ports are aimed away from the pan to facilitate efficient hose routing.

The Series 2 pumps feature a pressure section with an enlarged 7-tooth gear set (made from dead soft steel alloy) and scavenge sections with a twin-lobe Roots-type setup. They are available with one through six sections with a cast iron pressure section and aluminum scavenge sections. Sections are offered in five widths: 1.000", 1.250", 1.500", 1.750" and 2.000".

Aviaid Series 2 pumps feature an enlarged 7-tooth gear set on the pressure side and a twin-lobe Roots-type setup in the scavenge sections.

Mounting blades are incorporated as section spacers for many applications. This provides for moure rigid mounting than those competitors with mounts that bolt to spacers. In addition to the adjustable mounts, Aviaid Series 2 pumps are available with direct-to-block mounting and KSE pattern cam drive mounts.

Drive and idler shafts are precision-ground chrome moly steel, with the drive shaft available with a 3/16" belt drive keyway, 3/8", 7/16" or 1/2" hex drives. The drive shaft runs on precision roller bearings and the idler shaft is fixed in the pump.

Aviaid's modular design is the key to flexibility and allows pumps to be configured to fit most any configuration from normally aspirated to huge twin-turbo applications. Pressure regulation is available internally or externally for any rotation or pump orientation.

OVERVIEW OF AVIAID SYSTEMS FOR THE LS

SYSTEM	MOUNT	DRIVE TYPE	USE	DESCRIPTION
LS-A1	Cylinder Head (right side)	Gilmer belt	Street & Mild Competition	Single stage auxiliary scavenge pump - use OEM pump for pressure
LS-A2	Cylinder Head (right side)	Gilmer belt	Street & Mild Competition	2-section scavenge pump for wet-to-dry sump conversion. Use OEM pump for pressure
LS-B	Engine block A/C bosses	HTD belt	Street & Competition	2 or 3-stage scavenge pump, use OEM pump for pressure
LS-C	Engine block (right side)	HTD belt	Street & Competition	3-stage pump with 2 scavenge and 1 pressure section
LS-D	Engine block (right side)	HTD belt	Competition only	4 or 5-stage pump with pressure and 3 or 4 scavenge sections.
LS-E	Engine block (right side)	HTD belt	Street & Competition sump pump	Single stage external wet
LS-F	Engine block (left side)	HTD belt	Street & Competition	3-stage pump with 2 scavenge and 1 pressure sections
LS-G	Engine block (left side)	HTD belt	Street & Competition	3-stage pump. (drive in front of damper, retains use of factory air conditioning)

Choose from these options to align the pump drive with engine accessories or engine builder preference

COMPONENTS OR COMPLETE

You may purchase components individually, or Aviaid can configure a complete system to your requirements. Packages can include the pump, oil pan, tank, filter adapter, mounts, pulleys, adapters, balancer and plumbing.

FIVE LS DRIVE ALIGNMENTS

LS-Y

LS-F

LS-Z

ASA conversion

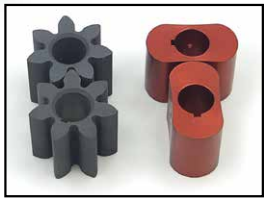
LS front drive

Choose from these options to align the pump drive with engine accessories or engine builder preference.

SYSTEM "LS-A"

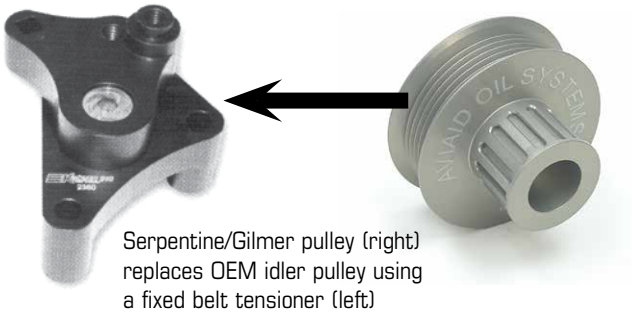
Notes: Designed for street use and mild competition. Uses OEM pump for pressure. Retains use of factory air conditioning and other accessories.

LS-A1 is a single stage pump to augment the factory dry sump system's internal scavenge pump



LS-A2 is a 2-section scavenge pump used to convert a wet sump engine to dry sump using the OEM pressure pump

Pump drive pulley for Gilmer belt



Serpentine/Gilmer pulley (right) replaces OEM idler pulley using a fixed belt tensioner (left)

Cast aluminum pan

Available with either Series 1 or Series 2 pumps

This system adds an external scavenging pump, while employing the OEM pump for pressure and oil regulation. It is available with either Series 1 or Series 2 pumps. It allows the retention of the factory air conditioning system and is driven by the stock serpentine belt using a dual-drive idler pulley mounted on a fixed-position tensioner. Systems can retain the stock damper, or use an ATI Super Damper that accommodates the OEM serpentine belt drive. Requires an oil pan that allows direct porting of the oil tank supply line into the factory internal oil pump.

Includes:

- Head mount pump design retains factory air conditioning
- Mounting bracket (pump to cylinder head)
- Fixed idler assembly
- Cast aluminum pan
- Sump tanks
  Choice of OEM Corvette Z06 conversion (optional internal Baffles) or 6", 7.5" and 9" diameter tanks (to 12 qt. capacity)
- Sump tank vent, heater and sight tube (optional)
- Serpentine/Gilmer drive pulley (replaces OEM serpentine idler pulley
- Oil line and fitting kit available

Features/Benefits:

- Retains factory air conditioning
- Eliminates oil starvation in hard cornering and high RPM operation
- Cooler operating temperatures
- Larger lubrication system capacity
- Eliminates parasitic horsepower loss through excessive windage
- Provides more usable power

SYSTEM "LS-B"

Notes: Engineered for serious club racers. Used on C5R Corvettes at LeMans. Streetable. Mounts to factory air conditioning bracket. Uses OEM pump for pressure.

These are 2, 3 or 4-stage scavenge-only dry sump pump systems. The pump mounts directly to the block in place of the air conditioning compressor bracket. The scavenge-only setup allows for conversions of stock LS wet sump systems to dry sump using the OEM pump for oil pressure and pressure regulation. The dry sump scavenge pumps are driven from the ATI damper by an HTD belt. This direct bolt-on (no adjustment required) pump can be more broadly configured than the LS-A system, which is limited in overall pump size. Requires use of a pan allowing direct porting of the oil tank supply line to the OEM internal pump.

Includes:

- Aviaid 2 or 3-section dry sump pump (scavenge only) with HTD drive gear
- Adapter mounting pump to block air conditioning bosses
- Cast aluminum oil pan
- Sump tanks (choice of 3)
  - OEM Corvette Z06 (optional internal baffle)
  - 6" diameter round (8 or 10-quart system capacity)
  - 9" diameter round (12 quart system capacity)
- Sump tank vent, heater and sight tube (optional)
- Line and fitting kit available (optional)
- ATI Super Damper with special hub*

(* hub available separately if engine already equipped w/ATI damper)

Features/Benefits:

- Enhanced scavenge capacity. Can provide 8-10 inches vacuum.
- Provides more usable power
- Eliminates oil starvation in hard cornering and high RPM operation
- Cooler operating temperatures
- Increased lubrication system capacity
- Eliminates parasitic horsepower loss through excessive windage
- Compatible with OEM front drive assembly (water pump. alternator, etc.)

2-section dry sump pump with bracket to attach pump to factory air conditioning mounting bosses

ATI SuperDamper with HTD drive hub and ASA system conversion

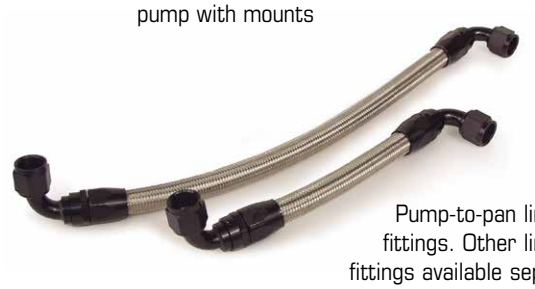
Modified LS2 cast aluminum pan with windage tray

SYSTEM "LS-C"

Note: ***Versatile system designed for use in applications from street to heavy competition. Pump mounts directly to block. Also used to convert ASA cars to full dry sump (special hub works with existing ATI damper)***

Available with either Series 1 or Series 2 pumps

3-section dry sump pump with mounts



Pump-to-pan lines and fittings. Other lines and fittings available separately

Includes:

- Aviaid 3-section dry sump pump (1 pressure, 2 scavenge sections) with LS-specific non-adjustable block mount and HTD belt drive
- AOS stamped steel dry sump pan with screened pickups and louvered windage tray
- ARE cast aluminum pan (optional)
- Sump tanks (choice of 3) AOS Billet Pan
  - OEM Corvette Z06 (optional internal baffle)
  - 6" dia. round, 18-20" tall (8 or 10-qrt system capacity)
  - 9" dia. round, 17" tall (12 qrt system capacity)
- Sump tank vent, heater and sight tube (optional)
- ATI Super Damper with Aviaid HTD drive hub
- HTD drive belt and hardware
- Pump-to-pan scavenge lines and fittings available
- Application-specific plumbing kit available

ATI SuperDamper with HTD drive hub

Special drive hub for ATI Super Damper that connects to Typical ASA dry sump system.

Features/Benefits:

- Provides ability to regulate oil pressure
- No RPM limit
- Billet aluminum pan optional
- Cooler operating temperatures
- Larger lubrication system capacity
- Eliminates parasitic horsepower loss through excessive windage
- Provides more usable power

A true 3-stage dry sump system providing 2 scavenge sections and 1 pressure section driven by an HTD belt off a special ATI damper. This eliminates any concern of cavitation by overspeeding the stock internal pump. It bolts directly to the block in place of the air conditioning compressor bracket, and is a direct fit requiring no belt adjustment. The pump is configured to fit between the drive belt and motor mount for ease of installation. It makes for a very compact fit with a minimum of fabrication.

LS Billet Pan

SYSTEM "LS-D"

Note: Designed for all-out competition. Uses 4 or 5-stage pump configured to the exact requirements of the application.

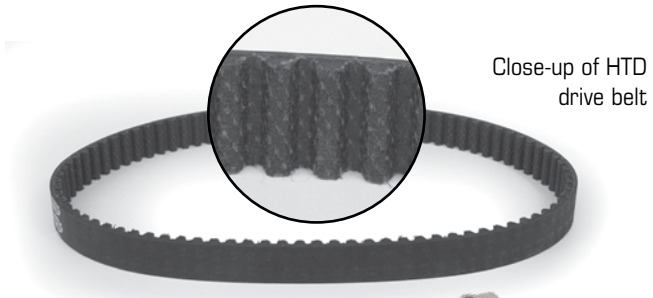
Completely configurable multi-stage dry sump pump solution for all LS requirements. Typically built in 4 or 5-stage configurations, the pump mounts outboard of the stock motor mounts and is not limited as to stages or accessory drives. Power steering and/or fuel pumps can be driven off the back of the pump through an adapter. Angled port housings allow for directing inlet and outlet ports to fit most any chassis and installation. The drive is typically from behind the ATI damper shell. Pumps can also be configured to drive from in front of the damper.

Features/Benefits:

- Adjustable oil pressure and significantly increased volume
- Eliminates oil starvation in hard cornering and high RPM operation
- Cooler operating temperatures
- Larger lubrication system capacity
- Eliminates parasitic horsepower loss through excessive windage
- Provides more usable power

Includes:

- Aviaid 4 or 5-section dry sump pump with Gilmer drive gear
- Bracket mounting pump to engine block (adjustable) w/turnbuckle adjuster
- Oil pan (choice of 3)
  - Billet 1.75" deep
  - Cast aluminum pan
  - 2 stamped steel pan w/screened pickup and AOS louvered windage tray, 1.7 or 3" deep
- Sump tanks (choice of 3)
  - OEM Corvette Z06 (optional internal baffle)
  - 6" diameter round (8 or 10-quart system capacity)
  - 9" diameter round (12 quart system capacity)
- Sump tank vent, heater and sight tube (optional)
- HTD drive belt
- All necessary lines and fittings (optional)



Close-up of HTD drive belt

ATI SuperDamper with HTD drive hub and ASA system conversion

ATI Super Damper with HTD drive in front

Aviaid low profile billet aluminum pan

PN=152-52501

SYSTEM "LS-E"

Note: External wet sump pump eliminates need for OEM unit. Provides increased volume and pressure adjustability.

This single-stage external wet sump pump features the LS "C" block mount bracket. The direct bolt-on, non-adjustable mount utilizes a special hub that is on the back of the damper shell. Various pressure sections, ranging from 5 to 20 gpm delivery are available in aluminum or cast iron housings. Power steering and/or fuel pump drives are available off the back of the pump with an adapter.

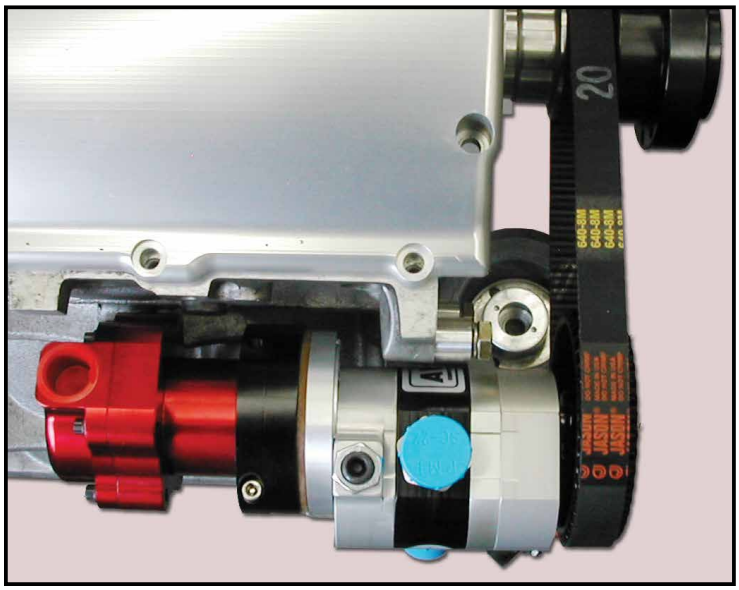
PN=111-9170XX

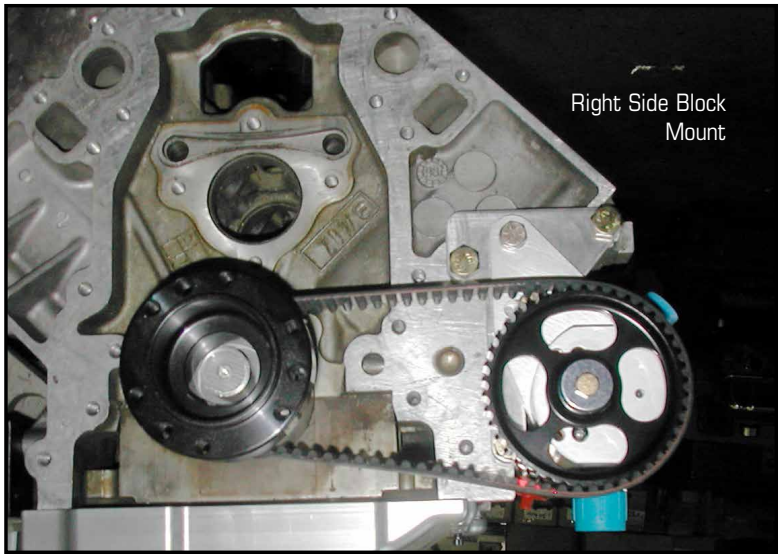
Includes:

- Aviaid single stage wet sump pump with HTD drive gear
- Mounts directly to block
- Modified LS2 cast pan
- Works with any wet sump manufacture pan with external pick-up
- HTD drive belt
- All necessary lines and fittings (optional)
- •ATI damper assembly or damper hub only
- Available for "F" and "Y" or "Z" front drive

Features/Benefits:

- Enhanced scavenge ability
- Provides more usable power
- Eliminates oil starvation in hard cornering and high RPM operation
- Cooler operating temperatures
- Compatible with OEM front drive assembly (water pump. alternator, etc.)
- Clears factory motor mounts





Right Side Block Mount

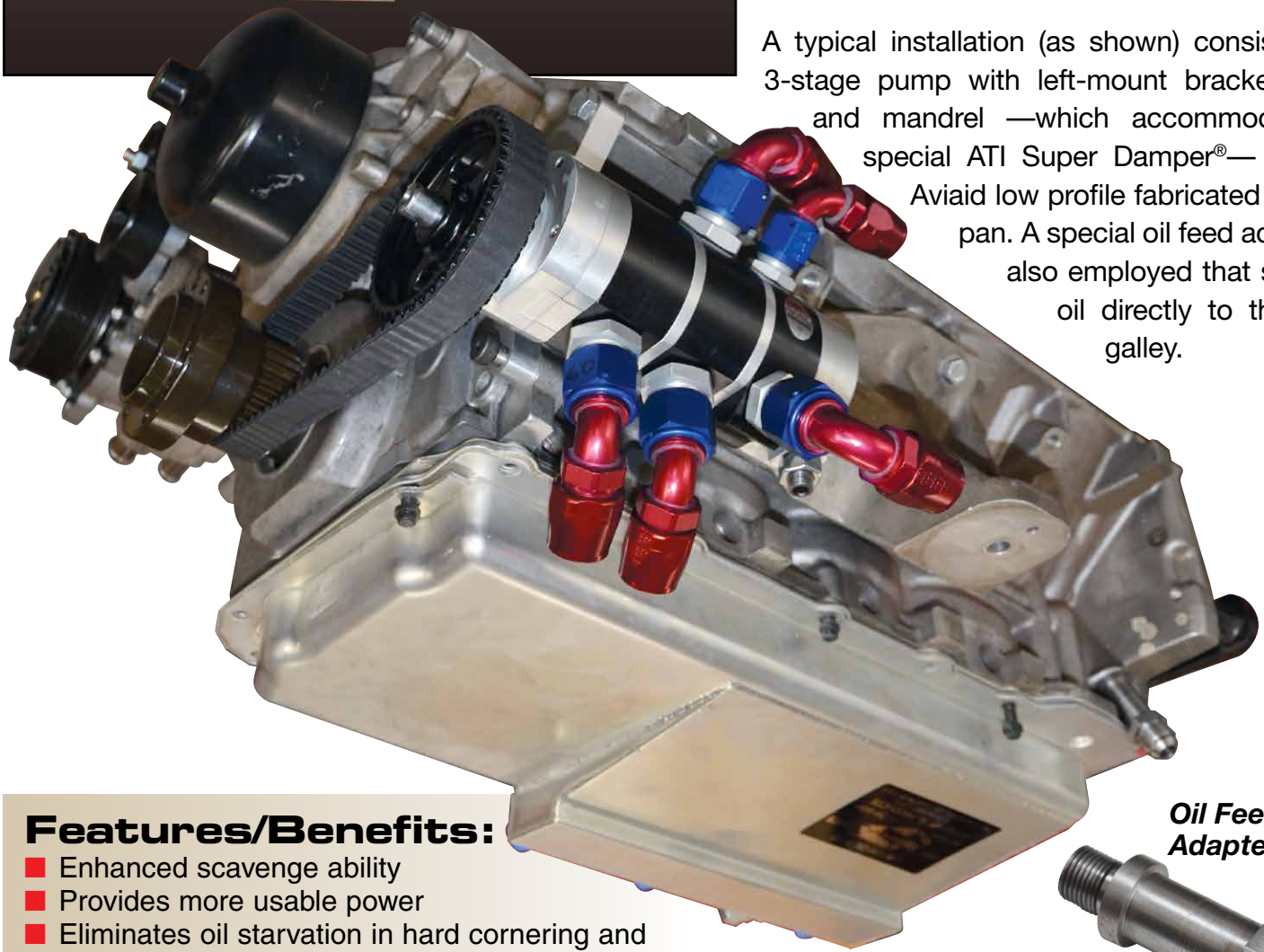
SYSTEM "LS-F"

Left Side Mounting

An adjustable, belt-driven 3 or 4-stage pump mounts off the left/US driver's side, providing a solution for right hand drive vehicles. This setup mounts accessories low on the passenger side. The 3-stage configuration fits in front of the stock motor mount. It is driven via an HTD belt hub behind the damper shell. It cannot be used in conjunction with OEM air conditioning

This setup is most efficient when accessory placement prohibits a right side mount, or in a mid-engined chassis (no steering components to contend with).

A typical installation (as shown) consists of a 3-stage pump with left-mount bracket, drive and mandrel —which accommodates a special ATI Super Damper®— and an Aviaid low profile fabricated steel oil pan. A special oil feed adapter is also employed that supplies oil directly to the main galley.



Oil Feed Adapter

Features/Benefits:

- Enhanced scavenge ability
- Provides more usable power
- Eliminates oil starvation in hard cornering and high RPM operation
- Cooler operating temperatures
- Compatible with OEM front drive assembly (water pump. alternator, etc.)

SYSTEM "LS-G"

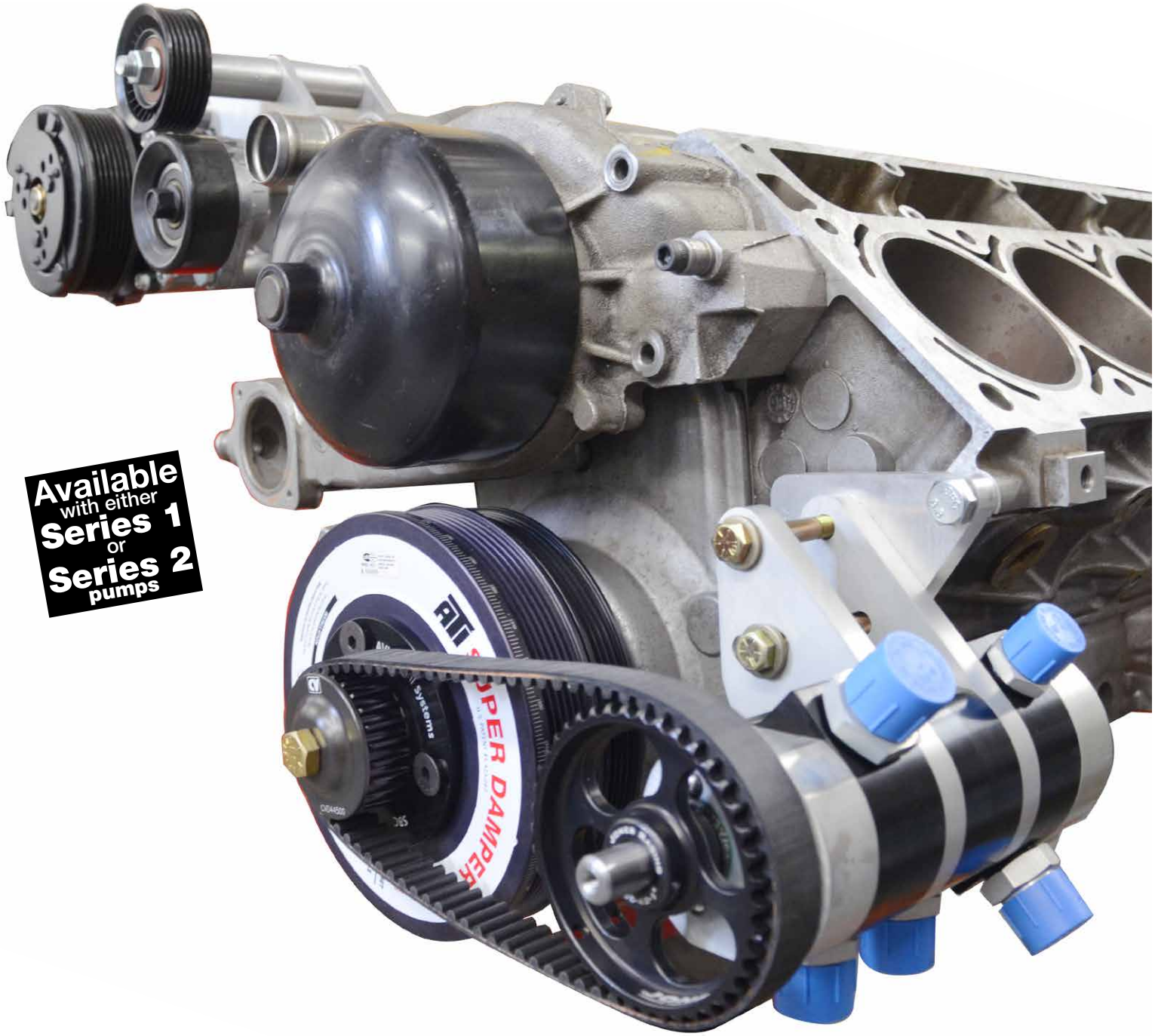
Left Side Mounting

Based on the "LS-F" left/US driver's side mount configuration, this setup puts the pump forward as typical for a Small Block Chevy (Gen 1) dry sump system. The 3 or 4-stage pump is driven from in front of the ATI Super Damper using an Aviaid HTD belt drive adapter. This system allows for the retention of all OEM accessories, including the air conditioning compressor in the stock location. All Aviaid Series 1 components can be adapted to this configuration.

Features/Benefits:

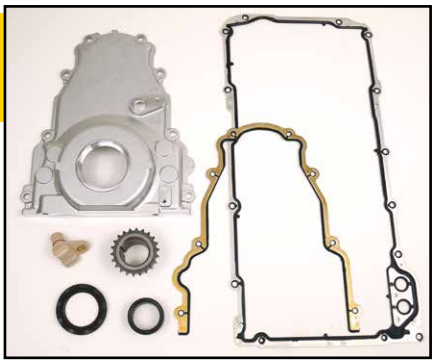
- Enhanced scavenge ability
- Provides more usable power
- Eliminates oil starvation in hard cornering and high RPM operation
- Allows use of OEM air conditioning
- Cooler operating temperatures
- Compatible with OEM front drive assembly (water pump. alternator, etc.)
- Clears factory motor mounts

Shown is a 3-stage pump, although different configurations can be employed. Because of its ability to retain the OEM air conditioning, it is a popular setup for the serious street enthusiast.



LS7 PAN CONVERSION KIT

This cleverly engineered kit allows owners of LS-7 equipped vehicles to utilize the various components designed for use in LS1-LS6 applications. For example, it will facilitate using Aviaid's billet aluminum low profile pan with an LS-7, as well as other lubrication system components on the market for LS1 through LS6 applications.



OIL PANS FOR LS APPLICATIONS

- 152-52501 – Stamped steel dry sump pan with 3" deep rear sump and two -10 pickups
- 152-52502 – Stamped steel dry sump pan with 3" deep rear sump and three -12 pickups
- 152-52502-10 - Stamped steel dry sump pan with 3" depth and three -10 pickups
- 152-52502-12 - Stamped steel dry sump pan with 3" depth and three -12 pickups
- 152-52503-10 - Stamped steel dry sump pan with 1-3/4" depth and three -10 pickups
- 152-52503-12 – Stamped steel dry sump pan with 1-3/4" depth and three -12 pickups
- 152-52504 – Stamped steel dry sump pan with 3" depth and three -10 pickups
- 152-52504-10001 - Modified LS3 pan with two welded-in pickups and pressure inlet. For T1 Corvette
- 152-5205 – Billet aluminum dry sump pan (1-3/4" deep) with five ports
- 152-52504-12 - Stamped steel dry sump pan with 1-3/4" depth and -10 left side outlet
- 152-52508 -12 - Stamped steel dry sump pane with 1-3/4" depth and -12 pickups. Ideal for rock crawling.
- Cast aluminum dry sump pans are also available. Check for availabilities and specs.

152-52501

CAST

152-52505

152-52503-12

152-52504-12

152-52508-12

152-52504-10001

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