



# WHICH ENGINE?

by Neil Sidders, 235 Rowland Road, Monroe, LA 71203

When searching for an engine, it becomes a task that can be quite simple if the designer is specific as to which engine can be used. However many designs are very open and if you are not careful that bargain engine could be a very costly purchasing error.

Here's an example. You are building a slick low-wing airplane and someone offers you a deal on a O-320-E2D. You take a sizable chunk of your airplane building stash and tuck that little gem away in the corner of your shop thinking your engine needs are taken care of. The day comes to start your firewall forward part of your project so you dust off the engine and fit it to the mount. That went OK so you start looking at the systems you need to install. Hey- there's no fuel pump. There's not even a place for a pump. The carburetor is in the way of the nose wheel, I really need a constant speed prop and there's no place to put a governor. I was going to upgrade to 160 HP, but the factory doesn't recommend that because this particular version utilizes a front main bearing from the O-235 series. Oh yeah, those plain steel cylinders didn't fare too well while it was stored.

Suddenly you realize that super deal you got is just taking up space in your shop and you still need an engine.

Now I'm not picking on the O-320-E2D, it's a good engine. The E2D was configured for a simple gravity feed installation at minimum cost to the customer. If you are building a Super Cub replica or similar sport plane it might be a good choice. The most complicated thing about this engine is the type 1 dynafocal mount.

When it comes to engine mounts, my personal choice is the conical style. As much as 12 pounds can be saved depending on which dynafocal mount you are comparing to and a complete set of mounting bushings is about \$30.00.

The following is presented as an aid to give you a place to start your search. after all, there are over 200 engines to choose from in the 140 to 200 HP range from Lycoming alone!

**Example:** LTIO(prefix) -360(displacement) -A1A6D(suffix)

## Prefix

- O - Opposed
- I - Injected
- V - Vertical installation
- H - Helicopter
- L - Left-hand rotation
- M - Military drone, single mag.
- A - Aerobatic
- AE - Aerobatic equipped
- T - Turbocharged

## Suffix

First character - Horsepower and Mount

Second Character - 1 - Constant Speed

2 - fixed pitch

3 - Larger prop bolts

4 - Solid Crank

Third character - Mag type and sump type

Fourth character - Counterweight

Fifth character - Dual mag

O-340 - All the engines in this series are conical mount, carbureted engines rated at 160-170 HP. They have been out of production for about 30 years. Basically a O-320 with a 1/4 inch longer stroke.

Standard Case (narrow deck) - uses internal wrenching cylinder base nuts. Low compression engines are not recommended to convert to high compression. High compression narrow deck engines cylinder base reinforcement plates.

Wide deck case - uses external wrenching (hex) cylinder base nuts. OK to convert to high compression pistons.

O-320-E series - uses series O-235 front main bearing. Designed as a low-cost engine for production aircraft. Utilizes plain steel cylinders. Engines produced for gravity feed applications do not have provisions for a fuel pump.

C-Conical mount Engine	I-Type I dynafocal Mount	II-Type II dynafocal Horsepower
O-320-A	C	150
O-320-B	C	160
O-320-C	C	150
O320-D	I	160
O-320-E	I	140/150
O-320-H	I	160
IO-320-A	II	150
IO-320-B	II	160
IO-320-C	II	160
IO-320-D	I	160
IO-320-E	I	150
IO-320-F	I	160
LIO-320-B	II	160
LIO-320-C	II	160
AIO-320-A	I	160
AIO-320-B	I	160
AIO-320-C	I	160
AEIO-320-D	I	160
AEIO-320-E	I	150

Engine	Mount	Horsepower
O-360-A	I	180
O-360-B	I	168
O-360-C	C	180
O-360-D	C	168
O-360-E	I	180
IO-360-A	I	200
IO-360-B	I	180
IO-360-C	I	200
IO-360-D	II	200
IO-360-E	II	180
IO-360-F	I	180
VO-360-A	C	180
VO-360-B	C	180
HO-360-A	II	190
HO-360-B	C	190
HIO-360-A	C	180
HIO-360-B	C	180
HIO-360-C	II	205
HIO-360-D	C	190
HIO-360-E	II	190
LHIO-360-C	II	190
AIO-360-A	I	200
AIO-360-B	I	180
AEIO-360-A	I	200
AEIO-360-B	I	180
AEIO-360-H	C	180
IMO-360-A	C	180
IMO-360-B	C	230 @3500 RPM

## Engines with horizontal induction

O-320-DID
IO-320-A1A, B1E, C1B - rear mount
IO-320-B1C, B1D - adapter to rear mount
A1O-320-B1D - Front mount
O-360-A1C, A1G, A1G6, A1G6D
LO-360-A1G6D
O-360-C2B,C2D horizontal with pressure carb
O-360-C1F
O-360-F1A6, G1A6 - sump for nose wheel
IO-360-B1C, B1E, B2E - rear injector
IO-360-C1A, C1B, C1D6 - rear inlet
IO-360-C1C, C1C6, C1E6D, C2F-rear inlet w/14 degree adapter
IO-360-D1A, E1A, F1A - rear inlet
AIO-360-B1B - front injector

Not all were specific as to being front or rear inlet in the information I have available, however I believe them to be rear inlet unless otherwise specified.

This list is not to be considered complete. Some engines have been configured according to the requirements of kit plane manufacturers and these engines do not appear on the list of type certified engines.

The Acro II prototype used an O-360-A4A. It was fitted with a Bendix PS5C pressure carburetor and a Christen inverted oil system. The propeller that was on the airplane when I flew it was a 76 X 60 Sensenich metal unit.

The O-360-A4A is a 180 HP Type engine with a solid crankshaft. This was once considered the "standard" aerobatic engine when equipped as it was on the prototype.

This is also the engine - equipment combination recommended on the early Pitts Special plans. The O-360-A4A is the engine used on the Piper Cherokee 180.