



ADJUSTMENTS AND MODIFICATIONS  
FOR 1966 & 1967 4-4-2 MODELS  
(Conforming to NHRA Rules)

Questions are frequently asked on how to improve Oldsmobile performance at time drags. This letter is published to clarify some of these issues and is directed primarily to 442s.

If some of the items are not clear, it is suggested that you consult an Oldsmobile Service Manual.

#### Block and Bearings

1. The most important thing to do is to open up piston to bore clearance. Production piston to bore clearance is generally .001 to .0015. It needs to be .003-.004. Production pistons are O.K for durability. Production piston rings are also O.K. Some "Pros" use forged pistons and more clearance is needed with forged pistons (.008-.009) since they expand more than autothermic production pistons.
2. Connecting rod and main bearings should be left at production clearances, but for people who want to go all out, the crankshaft can be relieved to get .002 rod bearing clearance and .003-.004 main bearing clearances.
3. Connecting rod side clearance should be increased to .018-.020. This is measured with rods on crankshaft and clearance is measured with feeler gage inserted between the rods.
4. Oil pump pressure should be increased. On late 1966 442s and all 1967 442s, oil pump pressure has been increased by using a higher spring rate in oil pump bypass. Part number 397199. Valvoline, Kendall G.T.I. or Pennzoil racing oils are recommended since they have good anti foaming and wear additives.
5. Piston to deck clearance minimum spec. is .002. This can be done to increase compression ratio, but it is rather expensive, and intake manifold may need machining to fit the cylinder heads after this is done.

#### Cylinder Heads

Minimum spec. for cylinder head volume is 75. Remove .005" from bottom face of head for 1 cc decrease in volume.

Note: on 1967 442 W30 with Air Induction minimum ccs is 71.9.

#### Valve Train

Transmission shift points should occur at approximately 400 RPM above horsepower peak of engine. It does no good to shift too far above H.P.

peak of engine since power is dropping off rapidly.

If engine will not run up to RPM, it is suggested that springs with part number 397207 be used. They are good for load retention. These springs are the same as those used on 442 W30 engine with Ram Air Induction.

RPM at Peak HP of Oldsmobile Engines:

	442	442	442	Cutlass	Cutlass
	Ram Air	AMT	SMT	AMT	SMT
Cam No.	397328	396192	393859	396192	393964
RPM	5400	4800	5000	5200	5200
	Torenado	Delmont 88 425	Delmont 88 330	F-85 2bbl AMT SMT	Starfire & Police
Cam No.	390961	397744	396188	393859	396190
RPM	4800	4 bbl 4800	4 bbl 5200	4800 4800	5000

Timing

Optimum timing for performance is 13° BTC at 850 RPM no vac. Production ignition system and distributor should be O.K. under all stock drag conditions. If trouble is encountered at high RPM, then Capacitor Discharge Ignition system should be used. This is K66 option available at Oldsmobile dealers.

A.C. 43 or 44 spark plugs should be used at .025 gap.

Exhaust

Doug Jardine and M/T headers for 442 are available at most speed shops. These headers will also fit the 330 and 425 engines. Although some minor cobbling may have to be done to clear starting motor and L.H. upper control arm. Headers will give approximately 20 H.P.

Heat beneath carburetor should be blocked off. On 1966 Tri Carb Manifold there is a built-in gate. On 4 bbl manifolds, shims will have to be inserted between cylinder head and intake manifold at center crossover.

Carburetion

(Refer to pages 6M40 and 6M41 for adjustment procedures)

It is recommended to first try carburetion as received. For the most part, 4 bbls and tri carbs are rich enough. Some people have claimed better results by opening metering jets .005" on tri carbs. On 4 MV carburetors, the secondary metering rod lever can be bent up to pass more fuel, but do not raise more than 1/16" from factory setting.

Some richening can be accomplished by changing secondary air valve wrap. This is done by backing off on air valve and retighten until valve just closes. From this, turn 5/8 of a turn. This 5/8 of a turn is a starting point.

You may want to change from it.

### Chassis

The most common modifications for proper traction are:

1. Install air lift spring on right rear and set to about 10 psi.
2. Install Cure Ride 90-10 shocks on front. Available at retail parts outlets.
3. If traction is not good with above items, then try traction bars at the rear. There is no set formula for this and it is suggested that designs of top notch 442s be copied.
4. Drag tires and tire compounds change so rapidly that a definite brand cannot be recommended across the board. Best tire compound will mainly depend on strip pavement.

### Differential

A 4.11 or 4.33 ratio is commonly used with locking axle. The 4.11 and 4.33 ring and pinions can be installed in some cases as 3.55 and 3.90 differentials. They cannot be installed in differentials with ratios below 3.55.

Part number for 4.11 ring and pinion set is 9780491 and 4.33 is 9780492. Ring and pinion can be ordered through Oldsmobile dealers.

### Transmission (SMT)

There are three SMTs offered in 442s, Cutlasses, and F-85s.

Part No.	3877459 (close ratio)	3890534 (wide ratio)	3 speed
Make	Muncie	Muncie	Ford
1st	2.20	2.52	2.42
2nd	1.64	1.88	1.61
3rd	1.28	1.46	1.0
4th	1.00	1.0	

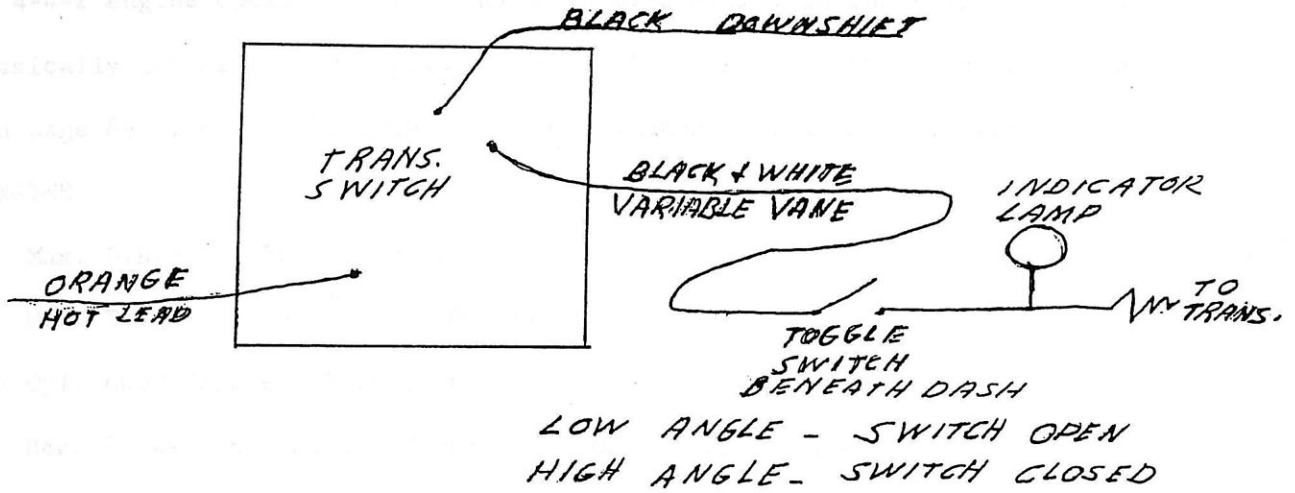
All are equipped with Hurst shift linkage. The major difference between production Hurst linkage and Hurst competition linkage is absence of stops. If stops are installed on production linkage, then it is as good as competition linkage.

### Transmissions (AMT)

In 1967 the 3 speed Turbo-hydrumatic is standard on 442s.

The following modifications are recommended for better performance.

At starting line, start in high stator angle. After car is underway and at approximately 1-2 shift, switch to low angle.



If it is desired to leave transmission in drive range and let it shift automatically, then shift points should be raised. Shift points should be two to three hundred RPM above horsepower peak of engine.

This can be done by removing material from secondary governor weight. (Refer to page 7-43 of Service manual for picture).

This is a cut and dry process and only a small amount of metal should be removed before each RPM check on the strip.

## 1967 W-30 (O.A.I. - Outside Air Induction)

A 4-4-2 engine option (O.A.I.) has been made available for 1967. The engine is basically the same as a regular 4-4-2 engine with specifications the same as listed on page 6B-41 of the 1967 CHASSIS SERVICE MANUAL with the following exceptions:

### ENGINE

Max. B.H.P. - 350 @ 5400 rpm

Max. Torque - 435 ft. lbs. @ 3600 rpm

Cyl. Head Volume - 71.9 cc Min.

Head Gasket Thickness and Volume - .023"-.027" - 5.34943 Min.

Deck Clearance - .002" Min. (Below)

Cylinder Block Volume - 2.0604 cc Min.

Total Combustion Chamber Volume - 79.30983 cc Min.

Engine Identification - Prefix V - Suffix G, Engine Color - Bronze with Chrome Valve Covers

Engine Weight - 644 lbs. (Dry)

<u>VALVE TIMING</u>	<u>INTAKE</u>	<u>EXHAUST</u>
Opens	44° BTDC	90° BBC
Closes	84° ABC	38° ATC
Overlap	82°	82°
Duration	308°	308°

Rear end of camshaft is stamped W-30

<u>VALVES</u>	<u>INTAKE</u>	<u>EXHAUST</u>
Head Dia. (Max.)	2.067"	1.629"
Angle of Seat and Face	30°	45°
Lift (Max.)	.474"	.474"

VALVE SPRINGS - Identified by two blue stripes; springs are made of Chrome Vanadium Steel and are heat set to eliminate load loss. Damper spring used on all valve springs. Valve spring loads are identical to regular 4-4-2 engine.

Piston to Bore Clearance - .0030" - .00375"

Main Bearing Clearance #1, 2, 3, 4 - .0005" - .0031"

Main Bearing Clearance #5 - .0015" - .0041"

Connecting Rod Side Clearance - .022" (Max.)

#### TRANSMISSION

Two transmissions are available with the W-30 Option, the only manual transmission available is the 4-speed close ratio (Option M-21) the servicing and specifications of which are found in the 1967 SERVICE MANUAL. The automatic transmission used is a Turbo Hydra-Matic, identified by the letters WOG on the transmission serial number plate. The internal parts are the same as found in any Turbo Hydra-Matic except for calibrations; therefore, the servicing procedures can be found in the 1967 CHASSIS SERVICE MANUAL. The WOG transmission has higher wide open throttle shift points. The WOG will also exhibit much firmer shifts.

#### DIFFERENTIALS

The W-30 Option uses only the Anti-Spin Differential ("P" type, Cone) the disassembly and assembly of which is described in the 1967 SERVICE MANUAL. The illustrations contained in the SERVICE MANUAL show the case halves being joined by six bolts and two pinion gears being used. The W-30 Option differential uses eight case bolts and four pinions. If case parts are worn or damaged, the case must be replaced with a complete assembly. Differential usage and identification is as follows:

4 Spd. Manual            Std. Ratio - 4.33:1 (3.90 or 3.55 Avail)

Code Q9 - Disc Brakes

Code Q5 - Std. and Power Brake

Turbo Hydra- Std. Ratio - 3.55:1 (3.91:1 and 4.33:1 ratios optional)  
Matc

Code TF - Disc Brakes

Code SJ - Std. and Power Brake

3.90:1 Ratio

Code T9 - Disc Brakes

Code TH - Std. and Power

#### IGNITION

Distributor Part No.

1111151

Set timing 10° BTDC at 850 rpm

1111179 (UHV)

1111042

Set timing 7-1/2° BTDC at 850 rpm

1111188 (UHV)

The distributor part number can be observed after removing the air cleaner on the forward edge of the distributor housing directly below No. 1 plug wire. Cars built with distributors 1111151 and 1111179 will not have a vacuum hose connected to the distributor vacuum advance; also, if equipped with K-19, it will not have a thermostatic vacuum switch.

Cars built with distributors 1111042 and 1111188 were built with a vacuum hose connected to the distributor vacuum advance and if equipped with K-19 has a thermostatic vacuum switch. Before attempting to adjust idle speeds or timing, it will be necessary to remove and discard the hose connected to the vacuum advance; if equipped with K-19, in addition to discarding the vacuum advance hose, it will be necessary to remove and discard the thermostatic vacuum switch and the attached vacuum hoses. Plug, Part No. 9781338, can be used to plug the vacuum port at the carburetor. If equipped with K-19, use Hose, Part No. 386136, in place of the thermostatic vacuum



switch and two short hoses. Plug thermostatic switch vacuum line ports at carburetor. DO NOT PLUG OR CAP THE DISTRIBUTOR ADVANCE UNIT.

Do not disconnect vacuum lines attached to the vacuum bleed valve on K-19 equipped cars.

Because of camshaft contour the W-30 engine is susceptible to rough idle; if smooth engine operation is unobtainable at 850 rpm, an alternate setting of 13° BTDC at 1300 rpm may be used. The timing bracket does not indicate above 10° BTDC; therefore, 13° BTDC will occur when the full width slot on the balancer is visible above the edge of the timing bracket.

#### CARBURETION

The W-30 engine uses a 4MV carburetor having the same adjustments and procedures as listed in the 1967 SERVICE MANUAL except for Idle Speed Specifications. The idle speeds are as follows:

##### Slow Idle

725 rpm - Manual Trans in "N" position - Turbo Hydra-Matic in "Dr"

##### Fast Idle

900 rpm - Manual Trans - Trans in "N" - Fast idle screw on LOW step of cam

1300 rpm - Turbo Hydra-Matic - Trans in "N" - Fast idle screw on LOW step of cam

NOTE: Before attempting to adjust idle speeds, refer to IGNITION SECTION.