

High Horsepower Tuning for Mechanical Fuel Injection

Index – Terms

Symbols

4 cylinder - 16, 46, 86
6 cylinder - 7, 16, 40
Flathead - Ford Flathead - 7, 8, 57, 93
265 - 52, 53, 138, 139
305 - 52, 53, 106, 107, 108, 138
350 - 350 ci - 350 cubic inch - 36, 42, 43, 66, 127
360 - 21, 24, 52, 53, 91, 106, 112, 127, 138
375 - 66
400 - 26, 28, 41, 60, 69, 91, 94, 129
400+ - 31
409 - 117
410 - 24, 25, 52, 53, 59, 114, 115, 116, 117, 118, 119, 138
421 - 119
427 - 69
454 - 139, 143,
468 - 116
475 - 37, 52, 53
505 - 140
526 - 38
535 - 10
540 - 52, 53, 54, 139
572 - 52, 53
 λ , See lambda

A

acceleration - 12, 22, 45, 64, 74
AD - air density - 24, 35, 36, 37, 51, 52, 128, 129
ADOL, See airdensityonline.com
aerated nozzles - 13
AFR - 6, 10, 21, 25, 31, 32, 33, 34, 35, 36, 37, 38, 40, 52, 53, 54, 55, 65, 66, 90, 92, 93, 94, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 112, 114, 115, 116, 117, 118, 119, 130, 141, 148, 149, 154, See air to fuel ratio
A-Fuel dragster - 9, 29
air density - 11, 17, 20, 22, 23, 24, 25, 26, 30, 32, 34, 35, 36, 40, 43, 44, 49, 50, 51, 52, 53, 54, 55, 56, 59, 60, 62, 63, 66, 69, 75, 76, 77, 85, 89, 91, 92, 99, 101, 104, 105, 106, 107, 108, 112, 122, 126, 129, 130, 146, 148, 149 - air density % - 11, 17, 20, 22, 23, 24, 25, 26, 30, 32, 34, 35, 36, 40, 43, 44, 49, 50, 51, 52, 53, 54, 55, 56, 59, 60, 62, 63, 66, 69, 75, 76, 77, 85, 89, 91, 92, 99, 101, 104, 105, 106, 107, 108, 112, 122, 126, 129, 130, 146, 148, 149

Air Density Index - air density - 126
airdensityonline.com - 58, 62, 75, 129, 154, 155
airdensityonline.com/free-calcs - 62
airdensityonline.com/tracks - 20, 58, 62, 75, 155
air to fuel ratio - 3, 6, 8, 16, 17, 18, 22, 23, 24, 27, 28, 30, 31, 32, 33, 35, 36, 37, 38, 40, 41, 44, 45, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 63, 66, 68, 69, 75, 76, 77, 84, 91, 99, 103, 105, 106, 109, 122, 128, 130, 147, 149, 154, See also AFR
altered - 20, 42, 50, 54
altitude - 23, 32, 35, 36, 37, 38, 51, 52, 58, 60, 62, 75, 76, 77, 106, 107, 108, 109, 126, 127, 128, 129, 154 - density altitude - DA - 23, 32, 35, 36, 37, 38, 51, 52, 58, 60, 62, 75, 76, 77, 106, 107, 108, 109, 126, 127, 128, 129, 154
Arden Hemi Heads - 7
Australia - Australian - 58, 75
Automan FI - 104
Autometer - 125
Autorama – 3

B

barrel or metering valve - 11, 16, 22, 25, 30, 38, 49, 51, 68, 72, 78, 80, 82, 85-89, 95, 98-99, 124, 126, 135, 141, 146, 150 - barrel valve spool, See spool
barrel or metering valve spool over center - 30, 78, 79, 89, 148, 149
bellmouth - 9, 112
best horsepower peak - 43
best torque peak - 53, 56, 99, 148
Beth Safranic - Matt Safranic - 3
Big Block - 6, 37, 57, 95, 96, 130, 139, 140, 149, 150, 155
Big Block crae engine - 46
Big Block V-8 - Big Block - 6, 37, 54, 95, 96
Bird Catcher - 10, 55
blower boost - 125
boat, See race boat
boat racing - 7, 41, 45, 56, 58, 83, 90, 98, 147
boost pressure - boost pressure gauge - 124
bracket race - bracket drag racing - 20, 21, 86
brake torquing - 83, 98, 147
breather - fuel tank breather - 22, 64
BSFC - brake specific fuel consumption - 40, 52, 154
Btu's - 154
Buick – 69

C

Cadillac V-8 - 27
camshaft duration - duration - 42

Canada - Canadian - 58, 75
carburetor - 6, 10, 11, 58, 92, 104
Check Valve - 125
Chevy - 115, 118, 140
Chrysler - 8, 68
Cindy Crump - 3
Circle boat - 90
Circle Seal - 125, 155
circle track - 14, 24, 41, 49, 66, 77, 80, 90, 93, 147 - circle racing - 151
clutch - 72, 77, 80, 82, 98, 147
compression - 7, 28, 69, 84, 112, 115, 116, 117, 118, 119, 140
compression ratio - 11, 112, 116-119, 140
condensing - 14
Cosworth - 11
CR, See compression ratio
Crane - 69
crew - pit crew - 18, 109
cylinder volume - 94, 95

D

David Smith Jr. - 3
deflector nozzles - 13
distribution block - 9, 12, 13, 124
Don Jackson - 3, 34, 52, 136, 155 - Don Jackson Engineering - 52, 155
Don Prudhomme - 18
down nozzles - 14, 56, 59, 91, 112, 122, 123
drag race - drag racing - 9, 10, 15, 17, 18, 20, 24, 27, 28, 29, 38, 41, 43, 55, 65, 66, 68, 87, 90, 92, 95, 98, 124, 130, 147, 150
dragster - 9, 10, 12, 14, 29, 45, 46, 64, 86, 110
driveability - 81
driver - 12, 15, 31, 68, 81, 82, 110
Driver - driver, See herein driver seat time - driver seat time - 81, 110
driver's leg length - 81
dynamometer - 6, 33, 40, 41, 44, 54, 60, 76, 82, 95, 96, 100, 148, 151
Dynamometer - 54, 151 - dyno - 115
dyno - 6, 54, 128

E

E85 - 1, 34, 111, 138-139, 143, 154 - E80 - 10
Early Hemi - early model Hemi - 8, 11, 38, 45
Enderle - 3, 10, 14, 24, 25, 26, 52, 53, 55, 64, 78, 79, 80, 90, 95, 150 - See also E - Enderle fuel pump - Enderle fuel injection - 10, 14, 24, 25, 26, 52, 53, 55, 64, 78, 79, 90, 95
Enderle Bird Catcher - 10, 55

Enderle square barrel valve - 14, 55 - K valve - 79, 95, 150
Engler - Engler Machine & Tool Co. - Engler Fuel Injection - 15, 55, 82, 87, 119, 148, 151
Enriquez - Enriquez, Don - 3, 45, 72, 77, 80, 120
ethanol-gas - 24
exhaust - 7, 12, 14, 16, 19, 21, 40, 41, 42, 54, 55, 66, 87, 96, 97, 99, 102, 103, 106, 109, 112, 116, 117, 119, 140 - exhaust collector - 96, 97
exhaust header - 16 - zoomie - 18, 96, 97, 149
exhaust ports - 14, 41
exhaust temperature - exhaust temperature monitoring - 103 - thermocouple - 106
exhaust temperature monitoring - 103

F

flat head - 7, 8, 57 - Ford Flathead, See Symbols
Flathead - Ford Flathead - 93
Flatline - flatlining - 8, 58, 59, 61, 62, 63, 99, 106, 148, 149
flatlining - 8, 16, 48, 58, 59, 61, 62, 63, 100, 101, 106, 107, 148, 149
flow bench - 6, 31, 33, 44, 47, 48, 55, 73, 86
foot - 65, 66, 71, 81, 82, 112
ford flathead - Ford Flathead, See Symbols
forecast - 20, 23, 58
Formula One - 14, 22, 23, 96
fuel demand - 30, 39, 40, 44, 46, 47, 53, 97, 99
fuel filter - clogged fuel filter - 51
fuel pressure - 6, 8, 15, 16, 17, 19, 23, 25, 35, 36, 37, 38, 47, 48, 49, 51, 52, 53, 55, 56, 58, 60, 61, 62, 63, 64, 65, 66, 67, 68, 76, 77, 78, 79, 84, 85, 90, 91, 92, 100, 101, 102, 104, 105, 106, 107, 108, 109, 121, 122, 124, 125, 128, 130, 146, 147, 148, 149
Fuel Pressure - fuel pressure gauge - 55, 62, 66, 73, 108, 124, 146
fuel pump - 8, 9, 12, 16, 22, 23, 24, 25, 26, 27, 28, 29, 30, 33, 36, 37, 38, 44, 47, 49, 50, 51, 52, 56, 59, 60, 64, 67, 68, 69, 73, 74, 75, 76, 77, 85, 90, 101, 105, 106, 108, 112, 114, 115, 116, 117, 118, 119, 141, 146, 154
Fuel Pump - 12, 24, 25, 26, 27, 28, 64, 74, 75
fuel pump internal pressure relief - 24, 30, 47, 54, 75, 146, 147
fuel split - 26, 30, 56, 60, 84, 122, 123, 130
fuel tank - 9, 11, 12, 15, 22, 30, 64, 72, 74, 89
fuel tank breather - breather - 22, 64
fuel temperature - 26, 29
fumes - 12
funnycar - 20

G

gallons - 154 - gallons per minute - GPM - 24, 39, 154
gas - gasoline - 1, 14, 18, 24, 27, 34, 38, 42, 72, 74, 78, 80, 98, 103, 106, 109, 111, 114, 130, 137-143, 145, 147, 149

gauge - 71, 79, 121, 124, 125
GM - 7, 69, 112, 114, 122
Golden - 66, 68
Good-Guys - 3, 157
Gordon Tarbell - 3

H

hat injector - 57
Heather Libretti - 3
Hemi - 4, 7, 8, 10, 11, 28, 38, 45, 61
high end - 8, 9, 10, 16, 18, 19, 27, 30, 36, 37, 38, 39, 40, 43, 44, 45, 46, 47, 48, 49, 51, 52, 53, 55, 56, 57, 58, 61, 63, 65, 67, 90, 91, 92, 93, 96, 97, 99, 100, 101, 102, 105, 107, 130, 147, 148, 149
high speed - 8, 15, 16, 19, 27, 28, 30, 31, 32, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 65, 67, 68, 84, 85, 92, 99, 100, 101, 102, 105, 106, 107, 108, 112, 114, 116, 117, 118, 119, 130, 141, 148, 149, 154 - HS - 26, 31, 44, 47, 52, 69, 106, 107, 112, 114, 115, 116, 117, 118, 151, 154
High Speed Bypass - high speed - HS - 15, 47, 48, 56, 61, 62, 67, 89, 99, 105, 106, 147, 148, 149
high speed bypass opening point - 16, 30, 38, 63
Hilborn - 1, 7, 12, 13, 15, 24, 25, 26, 27, 45, 52, 53, 55, 57, 64, 69, 72, 73, 77, 78, 80, 89, 90, 106, 112, 120, 121, 124, 157 - Hilborn fuel pump - Hilborn fuel injection - 1, 7, 12, 13, 15, 24, 25, 26, 27, 45, 52, 53, 55, 57, 64, 69, 72, 73, 77, 78, 80, 90, 106, 112, 120, 121, 124, 157
Hilborn Shotgun fuel injection - 57
horsepower - 16, 154
horsepower peak - 9, 16, 28, 30, 36, 37, 38, 39, 40, 41, 43, 44, 47, 49, 56, 59, 60, 61, 67, 90, 106
hotter fuel - 26
HP - 28, 38, 41, 43, 44, 56, 59, 69, 82, 92, 101, 105, 110, 147, 154, See horsepower
HS, See high speed
humidity - 17, 21, 32, 58, 62, 75, 76, 127, 128, 129
Hutchison - Glen Hutchison - 3, 86, 106, 112, 113 - Hutchison Racing - 3, 86, 106, 112, 113

I

idle bypass over center special test with leak down meter - 89, 126
idle fuel - 72, 78, 79, 80, 82, 83, 85, 86, 87, 88, 89, 146
idle horsepower - 72
idle launch - 78, 87
idle leak down - 19, 79, 80, 88, 89, 112, 146
idle speed - 70, 72, 87, 88, 89, 109, 112, 116, 117, 119, 146, 150
ignition - 19, 29, 61, 82, 83, 84, 85, 98, 147, 154
IHRA - 3, 9, 29, 50, 154
inlet suction problem - 73
intake runner length - 94
intake valve - 10, 13, 14, 87, 91, 92, 94

J

Jack Ditmar - 69
Jackson, Don - 3, 52, 155
Jeff Shirk - 3
jet - jetting - 2
jet selector - 51, 141, 142
Jet size chart - 121
Jim Kinsler - 3
John Buck Enterprises, Inc - Caitlein - 3
John Drummond - 3
Joni Elmslie – 3

K

Kinsler - 1, 3, 13, 24, 26, 47, 48, 50, 52, 53, 56, 58, 64, 74, 80, 81, 90, 112, 114, 115, 132, 135, 155
Kinsler relief valve - 47, 58

L

lambda - λ - 32, 154
land speed - Bonneville racing - 76
launch - 18, 45, 78, 82, 84, 85, 86, 87, 89, 98, 99, 109, 146, 147
leak down - 19, 78, 79, 80, 82, 86, 88, 89, 146
lean - lean AFR - lean air to fuel ratio - 18, 21, 27, 30, 31, 35, 37, 41, 43, 44, 45, 48, 49, 51, 56, 59, 60, 61, 63, 64, 66, 73, 77, 83, 85, 87, 90, 92, 100, 101, 102, 103, 105, 107, 148
lean out circuit - 99, 147, 151-152
link ratio - 82, 83, 87
long stacks - 8
low end - 8, 9, 10, 16, 19, 30, 37, 38, 39, 40, 41, 44, 45, 48, 49, 50, 51, 52, 53, 55, 56, 58, 77, 89, 90, 93, 96, 97, 99, 100, 101, 102, 105, 130, 146, 147, 148, 149
Lucan Oil – 104

M

magneto - 19, 29, 118, 134, 145, 155 - Mallory - 29 - Vertex - 29 - MSD - 29, 119, 140, 154
main bypass - 8, 15, 19, 25, 26, 27, 30, 35, 36, 37, 40, 41, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53, 54, 56, 58, 59, 62, 63, 66, 67, 68, 76, 77, 84, 85, 102, 106, 107, 108, 112, 114, 115, 116, 117, 118, 119, 130, 141, 154
Marchyshyn, Pam - 3
Marc Meadors - 3
MBP - 16, 21, 25, 26, 35, 36, 37, 38, 52, 53, 54, 55, 66, 69, 77, 89, 90, 92, 97, 99, 101, 104, 105, 106, 107, 108, 146, 147, 148, 149, 154
Metering Valve - 12

methanol - 6, 14, 24, 26, 27, 28, 31, 32, 34, 35, 39, 45, 51, 52, 55, 62, 65, 72, 74, 78, 79, 80, 89, 91, 103, 105, 109, 112, 117, 130, 154
monopropellant - 27, 29, 45
Mopar - 11, 57, 72
Mountain Motor - 55
Murry, Brendan – 155

N

NHRA - 3, 29, 104, 154
nitro - nitromethane - 3, 8, 10, 27, 28, 29, 32, 34, 45, 51, 62, 69, 72, 74, 78, 87, 89, 110, 124, 130
- nitro/meth'l - 34
nitromethane - 6, 72, 74, 130
Noshok - Noshok pressure gauge - 124
Nostalgia - 16, 17, 27, 28, 29, 57, 82, 98, 99, 110
Nostalgia A-Fuel drag racing - 28
nozzle - 2, 3, 13, 14, 16, 17, 18, 19, 20, 21, 22, 24, 26, 30, 31, 33, 36, 37, 38, 48, 49, 53, 55, 56, 58, 60, 62, 63, 76, 77, 84, 90, 91, 92, 99, 100, 101, 107, 108, 112, 114, 115, 116, 118, 120, 121, 122, 123, 130, 146, 148
nozzle fuel velocity - 91
nozzle & jetting calculator, See ProCalc
nozzle(s) - 2, 121
nozzles - up nozzles - down nozzles - 6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 20, 22, 25, 26, 30, 31, 33, 36, 37, 38, 43, 48, 49, 50, 51, 52, 53, 55, 56, 59, 60, 62, 65, 66, 67, 69, 74, 76, 77, 84, 90, 91, 92, 99, 101, 102, 104, 105, 106, 107, 108, 112, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 130, 141, 147, 149
numerical control - 6, 18, 23, 32, 33, 109

O

off-idle - 71, 89, 150
overhead cam – 46

P

part throttle - 55, 81, 82, 85, 86, 87, 98, 124, 146, 147
Patrick Hale - 3
performance - 155
pill can - 68
plenum - 9, 10, 11, 57, 65, 94, 95, 96
Pontiac - 10
poppet - bypass poppet - 15, 19, 31, 36, 47, 48, 52, 55, 56, 58, 59, 61, 62, 63, 65, 67, 68, 77, 78, 80, 100, 101, 104, 106, 107, 108, 146, 148, 149 - pressure poppet - 15, 19, 31, 36, 47, 48, 52, 55, 56, 58, 59, 61, 62, 63, 65, 67, 68, 77, 78, 80, 100, 101, 104, 106, 107, 108, 146, 148, 149, 151
port velocities - 41

pressure poppet - poppet - 31, 47, 58, 61, 78, 80
priming - 89
Pro A-Fuel - 28
ProCalc - 154 - calculator - jetting calculator - 5, 20, 21, 23, 25, 37, 38, 52, 53, 54, 59, 60, 61, 63,
69, 91, 101, 106, 107, 108, 121, 130, 151
protractor – 86

Q

Quarter Pro – 20

R

racecar - 18, 28, 45, 57, 69, 72, 81, 90, 100, 109
radiator hoses - 74
ram air - 56, 57, 58, 95, 130
ram tube - 7, 10, 12, 14, 16, 93, 94, 95, 96 - ram tube volume - ram tube length - 7, 10, 12, 14,
16, 93, 94, 95, 96
ram tubes - 10, 42, 43
Ray Hadford - 87
regulator - diaphragm - 15, 36, 47, 48, 52, 56, 58, 61, 62, 63, 67, 77, 78, 100, 101, 104, 106, 107,
148, 149
replacement - replacement jets - replacement nozzles - 22
richer - richer AFR - 10, 55, 79, 94, 96, 107 - richer air to fuel ratio - 10, 55, 79, 94, 96, 107
rollover valve - 64
Rons - Rons fuel pump - Rons fuel injection - 3, 16, 24, 25, 38, 43, 51, 52, 53, 64, 90, 101, 105,
147, 149
Rons fuel pump - 52, 101, 105
Ron Sterbenk - 8
RPM – 154

S

sea level - 76
secondary BP - secondary bypass - 15, 49, 55, 77, 80-82, 112, 114, 115, 116, 117, 118, 119, 146,
151
SEMA - Della Domingo, Peter MacGillivray, & Russell Datz - 3, 4
setup - 2, 4, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 21, 22, 23, 25, 31, 32, 33, 38, 40, 47, 48,
49, 51, 55, 56, 59, 63, 66, 67, 68, 70, 71, 76, 77, 78, 80, 84, 85, 86, 88, 89, 92, 95, 99, 102,
103, 105, 106, 107, 108, 109, 112, 122, 124, 125, 130, 146, 148, 149
shims and springs - 47
short intake stacks - 47, 97
Small Block - 6, 21, 31, 36, 42, 64, 112, 114, 115, 118, 122, 130, 137-139, 144, 150, 155
Small Block V-8 - Small Block - 6, 21, 36, 42
solenoid controlled bypass valve - 84, 87, 152-153
spark plug - 2

Spark plug - spark plug color - 50, 62, 102, 106
specific gravity - 141
spool - 13, 15, 78, 79, 80, 82, 83, 85, 86, 87, 89, 98, 99, 146, 147
spool position - 80, 82, 83, 85, 86, 87, 89, 98, 146, 147
Sprint Car - 3, 5, 14, 20, 24, 25, 33, 34, 49, 52, 53, 59, 72, 74, 81, 86, 90, 91, 106, 107, 109,
112-119, 127, 130-137, 145, 151, 154
stack - stacks - intake stacks - 89, 146
stack type - 1, 9, 14, 10, 21, 41, 45, 46, 48, 57, 69, 70, 72, 77, 78, 89, 94, 95, 100, 117, 130, 157
standard - air density standard - Motorsports Standard - 6, 32, 39, 42, 124, 129
stoich - stoichiometric - 34, 69, 154
stoichiometric - 154
stumble valve (Engler) - 15, 55, 82, 87, 151
Sunoco pump gas - 141
surge tank - 74
Szabo, Jennifer - 2, 3, 155
Szabo, Letty - 2, 3

T

temperature - 2, 17, 19, 26, 29, 32, 43, 49, 51, 58, 62, 65, 67, 76, 79, 84, 86, 102, 103, 106, 109,
127
Throttle - throttle ass'y - throttle assembly - throttle body - 1, 10, 11, 57, 70, 72, 82, 85, 86, 88,
146
Throttle Assembly - 10
Throttle blade - 70
throttle body - throttle bodies - 16
Throttle cable - 72
throttle pedal - 81 - throttle - 81
throttle shaft - 70, 71, 72, 73, 80, 81, 86, 88, 113, 146
Tomlinson - Vern Tomlinson - 90, 155
Tony Marini - 3
torque converter - 15, 82, 147
torque peak - 7, 8, 9, 16, 25, 27, 28, 30, 35, 38, 39, 40, 41, 42, 43, 46, 47, 48, 49, 52, 53, 55, 56,
58, 59, 60, 61, 62, 63, 66, 67, 68, 89, 90, 92, 97, 99, 100, 101, 102, 105, 106, 147, 148, 149
tractor pulling - 49, 90, 150
tune - 2
tuned length - 93, 96, 97, 106 - exhaust - 93, 96, 97, 106
tuning - 2, 3, 6, 7, 8, 9, 12, 14, 15, 16, 17, 18, 19, 21, 22, 23, 28, 30, 31, 32, 33, 35, 36, 38, 39, 40,
42, 43, 46, 47, 48, 49, 56, 57, 58, 59, 60, 61, 62, 63, 64, 67, 75, 76, 79, 80, 85, 87, 92, 95,
96, 97, 99, 102, 105, 109, 121, 127, 149
tunnel ram - 10, 11, 13, 55, 57, 71, 83, 94, 95
turbocharged - 33, 130
turnbuckle - 13, 78, 80, 81, 82, 86, 87, 88, 89, 98, 146, 147

U

up nozzle - 14

USA - 20, 50, 58, 124, 155

V

VA factor - 120, 121

Van Dyne Engineering - 86

vapor separator tank - 74, 155

vaporization - 14, 26, 35, 66, 91, 101

vaporize - 26, 64, 73 - vaporization - 26, 64, 73

Venting - 12

vol eff, See volumetric efficiency

volume - 154

volumetric efficiency - 154 - VE - 17, 25, 26, 32, 36, 43, 49, 59, 60, 61, 66, 77, 91, 105, 154

VW - 14

W

water hoses - 74

Waterman - Waterman fuel pump - 24, 51, 52, 53, 64, 90, 105, 115, 118, 132, 133, 147, 149,
157 - Waterman cable drive 132, 133

weather corrections - 6, 129

Weather Data - 20, 21

wedge head - 10

written records - 19

Z

zoomie - 18, 96, 97, 149
