

Type #1

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Mitsubishi Lancer 2008-2017

Turbo Conversion How-To

By AlphaTune101

Introduction

In This Guide, We'll Focus On The Mitsubishi 4B10, 4B11, And 4B12 Engines—The Backbone Of The Lancer Lineup During These Years. Whether You're Working With A Ralliart Or An Evolution X, The Goal Is To Help You Understand The Essentials Of Turbocharging While Avoiding Common Mistakes That Could Set Your Build Back. The Evopro ROM Tool, Paired With EvoScan, HDViewer, And A Tactrix Openport 2.0, Is Crucial To Establish A Safe Baseline, Validate Changes, And Maintain Reliability Throughout The Calibration Process.

Critical Tools Required Before You Begin

- Evopro ROM Tool (Mandatory): Core Utility For DTC Disabling, Injector Rescaling, MAF Adjustments, And MIVEC Calibration.
- EvoScan (Mandatory): Primary Datalogger For AFR, Fuel Trims, Knock, Boost, And Temperature Channels.
- HDViewer (Mandatory): Log Visualization And Comparative Review For Trend Analysis And Consistency Checks.
- Tactrix Openport 2.0 (Mandatory): ECU Interface For Stable Reads, Writes, And Live Data Streaming.

Proceed Only After Verifying Connectivity, Creating A Clean Baseline Log, And Confirming All Required Channels Are Available.

Do Not Mix Parts

One Of The Most Important Things To Remember Is That Not All Turbo Parts Are Interchangeable Between Models. The Evolution X Uses A TD05 Turbocharger Design, While The Ralliart Relies On A TD04. Mixing These Systems Is Not Possible Without Extensive Modification. Installing An Evo Turbo On A Ralliart Housing Simply Won't Work. Recognizing These Distinctions Early Will Save You Both Time And Money, And Ensure Your Project Starts On Solid Ground.

Preparation And Planning

Before Beginning Your Turbocharging Project, Make Sure You Have :

- A Clear Budget Plan.
 - The Correct Turbo Kit (Ralliart TD04 Or Evolution X TD05).
 - Supporting Upgrades (Exhaust, Cooling, Fuel).
 - Reliable Tuning Resources And Confirmed Access To Evopro ROM Tool, EvoScan, HDViewer, And A Tactrix Openport 2.0.
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Installation Tips

1. Ensure Proper Fitment Of All Turbo Components.
 2. Replace All Necessary Gaskets And Hardware.
 3. Check Oil Lines And Cooling Connections.
 4. Avoid Mixing Evo And Ralliart Component
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Tuning And Testing

- After Installation, Professional ECU Tuning Is Essential.
- Monitor Air/Fuel Ratios, Boost Levels, And Engine Temperatures.
- Start With Conservative Boost Settings Before Gradually Increasing.

Final Thoughts

Turbocharging Your Mitsubishi Lancer Between 2007–2017 Can Unlock Incredible Performance Gains—But Only If You Follow The Right Steps And Respect The Differences Between Ralliart And Evolution X Platforms. With Proper Planning, Correct Parts, And Reliable Tuning, You'll Be On The Road To A Faster, Stronger, And More Exciting Driving Experience.

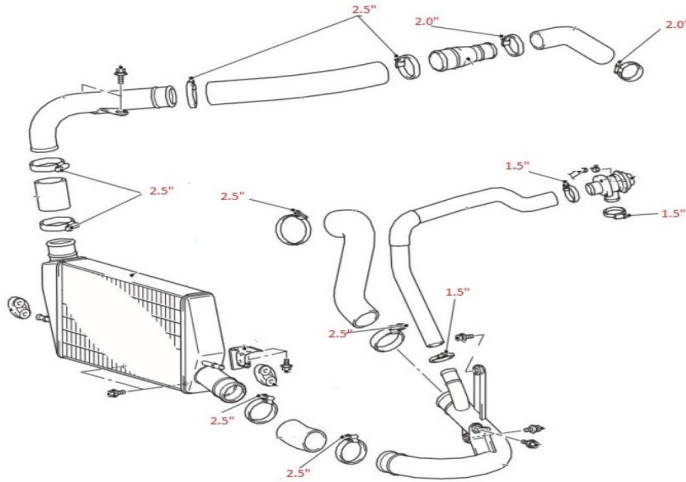
Step 1 : Supplies Needed

- ~ Turbo Manifold + Housing
 - ~ TurboCharger
 - ~ Downpipe
 - ~ Intercooler + Piping
 - ~ Gaskets (Exhaust Manifold #MS20038, Turbo Mount #1515A058, Turbo Mounting Inlet #AEG1117, Return Line Gasket #MR258477, Turbocharger Outlet Gasket #MR281085)
 - ~ 3/8" BSPT Male High Flow Nipple
 - ~ Oil Feed Restrictor
 - ~ H.Paulin Steel Brake Line (Provides Rust Resistance, Leakage Prevention, and Vibration Dampening, Making It Suitable For Hydraulic and Oil Lines To Many Vehicle Applications!)
 - ~ EvoX/RA Injectors (Optional)
 - ~ Gauges (AFR, Boost, Etc....)
 - ~ Custom Exhaust
 - ~ Stock Ecu and MAP Sensor. (That's Right, We're In 2025 Now!!)
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Step 2 : Mechanical How-To

Task #1 : Removing Front Bumper, Installing Intercooler + Piping

Diagram :



Task #2 : Removing and Installing New Exhaust Manifold, Gaskets + Washers

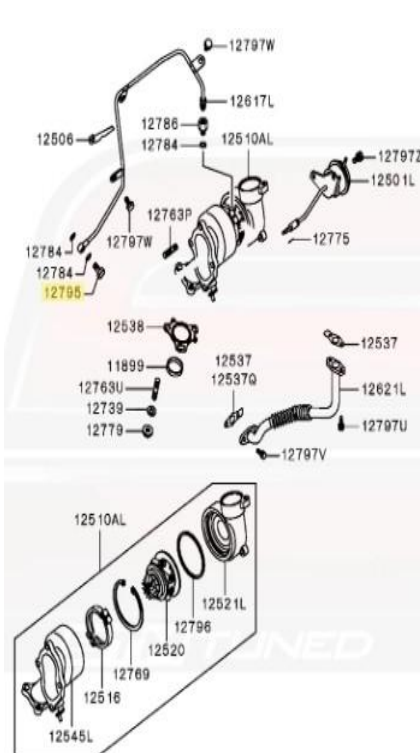


Task #3 : Installing Oil Feed and Return Line

Note : Under PCV Hose, Near Serpentine/Drive Belt. Originally Will Be a $\frac{3}{8}$ " BSPT Bolt! The Oil Drain Line From Turbocharger Will Have To Be Welded To The Oil Pan.

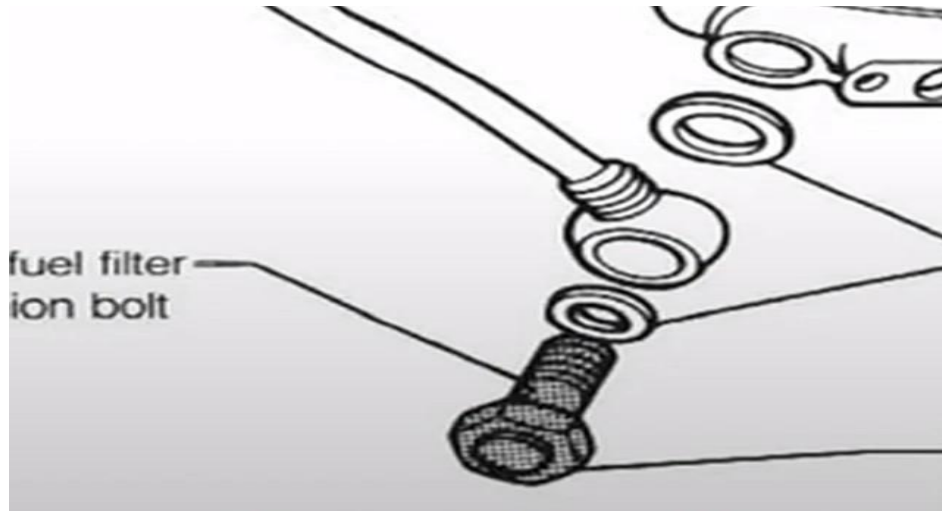


Task #4 : Connecting Lines To Turbocharger + Washers



Note : When Installing Lines, Be Assured To Have 2 Washers. You Would Go In Order Of :

- Banjo Bolt
- Washer
- Feed Line
- Washer



Typically On a Used Turbocharger, The Surface Between The Washer and Center Housing Rotating Assembly (CHRA) Will Not Be Flushed and Can Cause Leaks. Just Like Installing a New Brake Hose On a Used Brake Caliper. Give a Good Smack With a Hammer On Top Of The Head Of The Bolt, Which Will Crush The Washer Very Slight, and You Will Be Able To Get An Extra $\frac{1}{8}$ Of A Turn Without Pulling Any Threads!

Task #5 : Testing For Boost Leaks

As Much As a DIY Type of Person I Am, I was Able To Simply Figure Out How To Test For Boost Leaks Without Buying a Kit. That's Right, With Your (Hope To Be) 4-8 Gallon Air Compressor You Should Be Just Fine! What You're Going To Do Is Build Pressure From Your Air Compressor At a Consistent 25-30lbs Of Air, and Fit Your Air Compressor Hose Alike From The Picture Below.



Note : You Won't Physically Feel Air Escaping Unless There Was a Significant Leak. That Being Said, Grab Some Soapy Water and Get To Spraying Around All Of Your Intercooler Couplings. Water Bubbling Up Will Easily Indicate Any Boost Leaks.

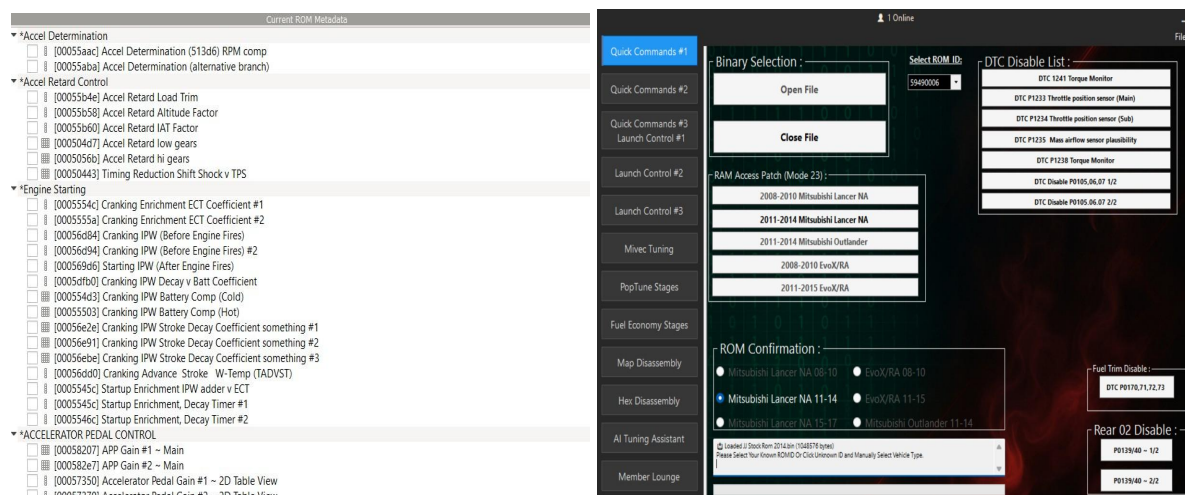
Task #6 : Recommendations

- **Use Quality and Higher Viscosity Engine Oil (5W-40/5W-50 For Summer Months) - (10W-40/10W-50 For Winter Months)**
 - **Consider Upgrading From OEM Clutch. More Power Can Mean More Strain on The DriveTrain.**
 - **Plan For Reliability, Not Just Power. Chasing Maximum WHP Can Unfortunately Cause Damage To Your Engine. Consider Running On Low Boost On Stock Connecting Rods.**
 - **The Right Tuner. Be In Mind More Than Just Disables Will Need To Be Done, and Just Injector Rescaling. Be Mindful Who You're Choosing For Your Tunes.**
 - **Adding a Turbocharger General Considers a Higher Volume Of Fuel Consumption. Consider Upgrading From OEM Fuel Pump, and Injectors Will Be Mindful**
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Step 3 : Reverse Engineering - Tuning

Overview :

Inside The Mitsubishi ROM There Will Be Many Factors That Require Tuning After Turbo Conversion. Immediately Following Installation, The Vehicle Will Attempt To Enter Limp Mode Due To Incorrect Sensor Scaling And Mismatched Parameters. To Prevent This And Achieve Stable Operation, The Following Steps Must Be Performed.



Task #1 : Required Tool

- **Ensure You Have The EvoPro ROM Tool.**
 - **This Tool Is Essential For:**
 - **DTC Disabling.**
 - **Injector Rescaling.**
 - **MAF Adjustments.**
 - **MIVEC Calibration.**
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Task #2 : DTC Disabling

Disable The Following Codes To Prevent Limp Mode And Ensure Proper Turbo Operation:

P1233, P1234, P1235, P1238, P0105, P0106, P0107, P0108

Task #3 : MAF Rescaling

- 1. Navigate To Quick Commands #2.**
- 2. Rescale Voltage Range From 1.2V To 5V.**
- 3. Adjust According To Intake Size:**
 - **Larger Intake → Incremental Upscale.**
 - **Smaller Intake → Decremental Adjustment.**
- 4. Guideline: Increase MAF Scaling By 8% For Every 0.5" Increase In Intake Housing Diameter.**

- **Example: Original Intake = 2.5" / New Intake = 3" → Upscale By 16% Across 1.2V–5V.**
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Task #4 : Injector Scaling - > Navigate To Quick Commands #3.

OEM Injectors

- **Set CC/Min To 180–200. (Lower Cc = Richer)**
- **After Stabilizing Idle To 16-17AFR, Adjust Injector Latency (MS Between 11.73V–16.42V).**
- **Fine-Tune Until Peak Idle And Cruise AFR Are Achieved.**

EvoX / Ralliart Injectors

- **Set CC/Min Between 460–532. (Lower Cc = Richer)**
 - **Use OEM Latency Values As Baseline.**
 - **If Required, Slightly Upscale Latency Between 11.73V–16.42V.**
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Task #5 : Fuel Economy And Tuning Modes

- **Fuel Economy Stages: Recommended For Closed Loop Operation.**
 - **Open Loop / WOT Tuning: Must Be Completed By A Reliable Tuner.**
 - **Datalogging Is Mandatory. Second Guessing Is Never Acceptable.**
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Task 6 : Advanced Adjustments

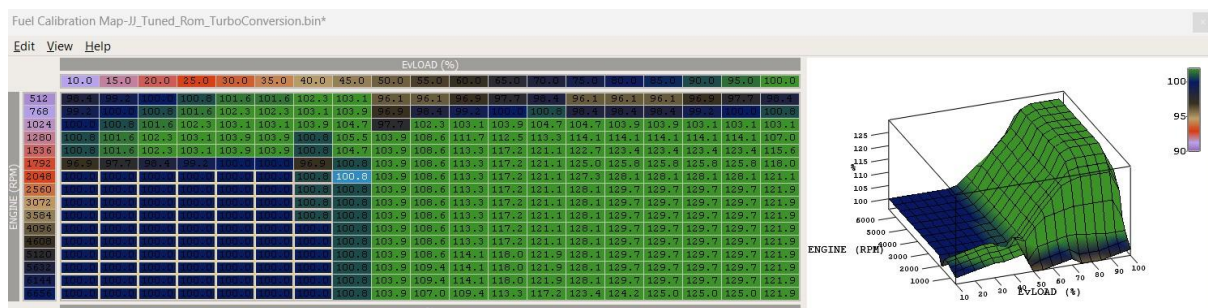
For Complete ROM Calibration, The Following Tables Require Adjustment Using A Hex Editor, WinOLS, Or ECUFlash:

- Engine Cranking.
- Throttle Enrichment.
- Throttle Lag Smoothing.
- Acceleration Enrichment.
- Engine Starting Tables.

Screenshots Of Required Tables Will Be Provided For Reference.

Notes :

Proper ROM Tuning Is The Foundation Of A Reliable Turbo Conversion. Following The Above Procedures Ensures Stable Idle, Safe AFR, And Smooth Transition From Closed Loop To Open Loop Operation.



Fuel Calibration (Open Loop)

Airflow Monitor #1 ~ New Style View-JJ_Tuned_Rom_TurboConversion.bin

Edit View Help

		APP (V)													
		0.51	0.74	1.00	1.25	1.50	1.74	1.99	2.25	2.50	2.73	3.01	3.50	4.00	4.49
ENGINE (RPM)	256	7	60	64	64	64	64	64	64	64	64	64	64	64	64
	512	7	60	65	65	65	65	65	65	65	65	65	65	65	65
	1024	4	37	57	63	66	68	70	70	70	70	70	70	70	70
	1536	2	22	51	63	69	71	72	72	73	73	73	73	73	73
	2048	2	17	44	58	67	71	73	73	74	76	77	77	77	77
	2560	2	13	37	55	66	72	75	77	78	79	80	81	81	81
	3072	2	12	32	50	62	70	74	77	78	79	79	79	79	79
	3584	2	10	29	46	60	69	73	76	79	80	81	81	81	81
	4096	2	9	26	42	59	71	77	81	84	85	86	87	87	87
	4608	2	9	24	38	55	68	77	81	84	85	87	87	87	87
	5120	2	8	22	35	51	65	75	80	83	85	87	88	89	89
	5632	2	8	21	32	47	62	74	80	84	87	89	90	90	90
	6144	2	8	19	30	44	58	69	77	82	85	87	87	87	87
	6656	2	9	19	28	41	55	65	73	78	82	84	85	85	85
	7168	2	9	19	28	41	55	65	73	78	82	84	85	85	85

Airflow Monitors (1 - 6)

Closed-Loop...			Closed-Loop...			Closed-Loop...			Closed-Loop...		
Edit View Help			Edit View Help			Edit View Help			Edit View Help		
RPM (RPM)	512	60.0	RPM (RPM)	512	60.0	RPM (RPM)	512	60.0	RPM (RPM)	512	60.0
	768	80.0		768	80.0		768	80.0		768	80.0
	1024	90.0		1024	90.0		1024	90.0		1024	90.0
	1280	95.0		1280	90.0		1280	95.0		1280	90.0
	1536	95.0		1536	80.0		1536	95.0		1536	75.0
	1792	95.0		1792	76.2		1792	95.0		1792	71.2
	2048	95.0		2048	68.8		2048	95.0		2048	65.0
	2560	80.0		2560	60.0		2560	80.0		2560	55.6
	3072	47.5		3072	47.5		3072	47.5		3072	47.5
	3584	40.0		3584	40.0		3584	40.0		3584	40.0
	4096	40.0		4096	40.0		4096	40.0		4096	40.0
	4608	40.0		4608	40.0		4608	40.0		4608	40.0
	5120	40.0		5120	40.0		5120	40.0		5120	40.0
	5632	40.0		5632	40.0		5632	40.0		5632	40.0
	6144	40.0		6144	40.0		6144	40.0		6144	40.0
	6656	40.0		6656	40.0		6656	40.0		6656	40.0

Closed Loop Load Limits

Thermo Fan Temperature-JJ_Tuned_Rom_TurboConve...

Edit View Help

Speed(kph)+Accel	Conditions			
	A/C Off	A/C On	A/C Max	
	0-40 Cruise Fan OFF	86	84	70
	0-40 Cruise Fan ON	88	86	80
	0-40 Accel Fan OFF	96	94	70
	0-40 Accel Fan ON	98	96	80
	40-80 Cruise Fan OFF	88	86	70
	40-80 Cruise Fan ON	90	88	80
	40-80 Accel Fan OFF	98	96	70
	40-80 Accel Fan ON	100	98	80
	80+ Cruise Fan OFF	88	86	70
	80+ Cruise Fan ON	90	88	80
	80+ Accel Fan OFF	98	96	70
	80+ Accel Fan ON	100	98	80
Celsius				

Radiator Fan Temp Control

Closed-Loop Fuel, Long Term T...			
Edit View Help			
Conditions	LTFT-Low -> Mid	50.00	Hz
	LTFT-Mid -> Low	25.00	
	LTFT-Mid -> High	125.00	
	LTFT-High -> Mid	118.75	

Closed Loop Fuel, LTFT Control Learning

Cranking IPW (...)			Cranking IPW (...)		
Edit View Help			Edit View Help		
ECT (units)	0	170.0	ECT (units)	0	170.0
	26	125.0		26	125.0
	51	90.8		51	90.8
	77	70.0		77	70.0
	102	48.3		102	48.3
	128	45.0		128	45.0
	153	26.7		153	26.7
	179	20.0		179	20.0
	204	15.8		204	15.8
	230	8.3		230	8.3
	255	5.0		255	5.0
ms			ms		

Cranking IPW (Before Engine Fires)

Max Load v Gear/Speed-JJ_Tuned_Rom_T... ✕

Edit View Help

		rpm/kmh (RPM/kmh)				
		56	70	84	99	113
RPM (RPM)	512	77.3	76.4	78.7	79.1	80.3
	768	77.3	76.4	79.1	79.1	80.3
	1024	78.6	78.9	81.0	82.2	80.1
	1280	80.1	80.4	81.9	85.0	84.9
	1536	81.5	82.5	83.8	85.0	87.3
	1792	83.1	85.7	86.6	88.3	89.9
	2048	85.3	87.8	89.0	90.4	91.9
	2304	86.2	89.7	91.4	92.4	94.0
	2560	86.2	90.4	92.9	93.9	96.8
	2816	86.2	90.4	94.5	95.7	99.3
	3072	86.5	91.3	95.0	97.6	107.9
	3328	86.5	92.3	95.0	97.6	107.9
	3584	86.5	92.9	95.0	97.6	107.9
	3840	86.5	93.5	95.0	97.6	107.9
	4096	86.5	93.5	95.0	97.6	107.9
	4608	86.5	93.5	95.0	97.6	107.9
	5120	86.5	91.3	95.0	97.6	106.8
	5632	86.5	91.3	95.0	97.6	103.3
	6144	78.7	85.7	91.7	96.8	100.4
	6656	65.0	72.2	79.5	85.6	90.9
		Ec%				

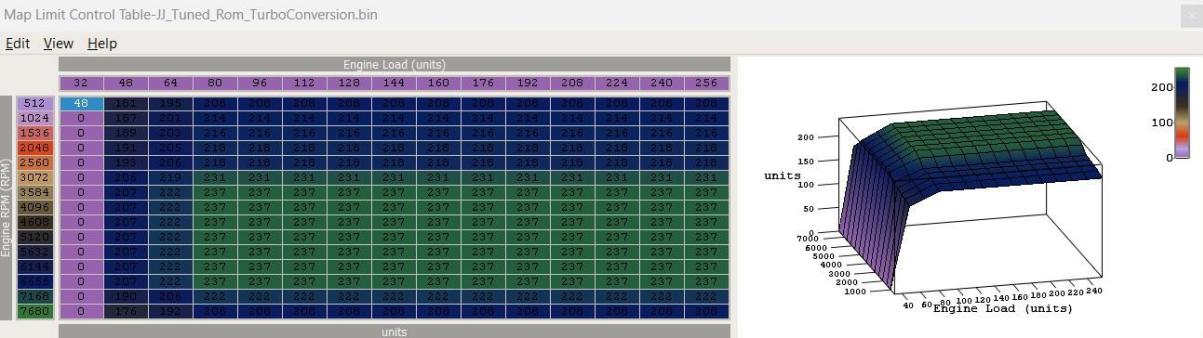
MAF Max Load v Gear/Speed

Closed-Loop S... ✕ Closed-Loop S... ✕

Edit View Help Edit View Help

ECT (Celsius)	-32	-12.501	STFT %
	-8	-12.501	
	7	-12.501	
	20	-12.501	
	34	-12.501	
	50	-12.501	
	77	-12.501	
	82	-12.501	
ECT (Celsius)	-32	-25.000	STFT %
	-8	-17.969	
	7	-11.329	
	20	-7.423	
	34	-3.712	
	50	-1.564	
	77	-1.564	
	82	-1.564	

Closed Loop STFT Min and Max



Map Limit Control Table

Throttle Requested Torque - 5MT-JJ_Tuned_Ro...							
Edit View Help							
		VehicleSpeed (km/h)					
		20	40	60	80	100	120
RPMperkmh (RPM/kmh)	15	100.0	100.0	100.0	100.0	100.0	100.0
	22	100.0	100.0	100.0	100.0	100.0	100.0
	30	100.0	100.0	100.0	100.0	100.0	100.0
	37	100.0	100.0	100.0	100.0	100.0	100.0
	45	100.0	100.0	100.0	100.0	100.0	100.0
	60	100.0	100.0	100.0	100.0	100.0	100.0
	75	100.0	100.0	100.0	100.0	100.0	100.0
	114	100.0	100.0	100.0	100.0	100.0	100.0
%							
Throttle Ramp Rate v Throttle adder Normal Mod...							
Edit View Help							
		Speed (km/h)					
		20	40	60	80	100	120
Throttle (%)	16.6	50.2	60.0	80.0	90.2	98.0	98.0
	24.8	50.2	60.0	80.0	90.2	98.0	98.0
	33.1	50.2	60.0	80.0	90.2	98.0	98.0
	41.4	50.2	60.0	80.0	90.2	98.0	98.0
	49.7	50.2	60.0	80.0	90.2	98.0	98.0
	66.2	50.2	60.0	80.0	90.2	98.0	98.0
	82.8	50.2	60.0	80.0	90.2	98.0	98.0
	132.4	50.2	60.0	80.0	90.2	98.0	98.0
%							
Throttle Ramp Rate v Throttle adder Sport Mode-...							
Edit View Help							
		VehicleSpeed (km/h)					
		20	40	60	80	100	120
Throttle (%)	16.6	80.0	80.4	100.0	100.0	100.0	100.0
	24.8	80.0	80.4	100.0	100.0	100.0	100.0
	33.1	80.4	80.8	100.0	100.0	100.0	100.0
	41.4	80.8	81.2	100.0	100.0	100.0	100.0
	49.7	82.0	82.0	100.0	100.0	100.0	100.0
	66.2	83.5	83.9	100.0	100.0	100.0	100.0
	82.8	85.9	86.3	100.0	100.0	100.0	100.0
	132.4	89.4	89.8	100.0	100.0	100.0	100.0
%							

Throttle Ramp Request Tables

APP Gain #1 ~ Main-JJ_Tuned_Rom_TurboConversion.bin

Edit View Help

		Temp (Celsius)							
		-32	-8	7	20	34	50	77	82
APS (Volts)	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	0.1	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500
	0.2	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
	0.3	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.4	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.5	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.6	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.7	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.8	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	0.9	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.3	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.4	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.5	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.6	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.7	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.8	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	1.9	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
2.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
2.5	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
3.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
3.5	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
4.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
4.5	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
5.0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
		Correction Factor							

Acceleration Pedal Position Tables

Torque Monitor #5-JJ_Tuned_Rom_TurboConversion.bin																	
Edit View Help																	
	THROTTLE (THROTTLE %)																
	0.0	2.6	5.3	7.9	10.7	13.3	16.0	18.6	21.4	24.0	26.7	32.0	37.4	42.7	53.4	79.3	106.6
	512	80	80	132	152	158	159	160	160	160	160	160	160	160	160	160	160
	1024	47	47	81	116	135	145	157	161	162	165	164	160	171	171	172	174
	1536	31	31	59	87	117	139	152	163	169	172	180	183	186	187	190	190
	2048	25	25	44	68	95	121	142	157	168	175	180	192	195	200	202	205
	2560	0	21	37	56	78	100	126	146	165	177	186	202	206	212	214	219
	3072	0	19	32	46	67	88	108	129	148	167	198	223	232	244	246	248
	3584	0	16	30	42	58	76	96	116	137	156	193	222	237	246	255	255
	4096	0	16	28	40	52	67	85	105	126	146	186	223	240	246	255	255
	4608	0	15	26	36	46	59	75	96	113	134	177	215	239	247	255	255
	5120	0	14	24	34	44	54	69	87	103	124	160	204	229	242	255	255
	5632	0	14	24	33	43	53	65	80	97	114	144	192	219	237	255	255
	6144	0	13	23	32	41	50	60	74	89	106	135	182	206	232	255	255
	6656	0	13	23	32	41	49	59	71	83	100	129	169	201	228	255	255
	7168	0	16	26	34	43	53	61	71	82	98	126	161	191	223	255	255
units																	

Torque Monitors (1 - 5)

Starting IPW (...)

Edit View Help

ECT (Celsius)	-32	360.000	mSec
	-18	272.000	
	-8	209.600	
	7	144.800	
	20	134.800	
	34	79.800	
	50	60.000	
	77	47.400	
	82	25.000	

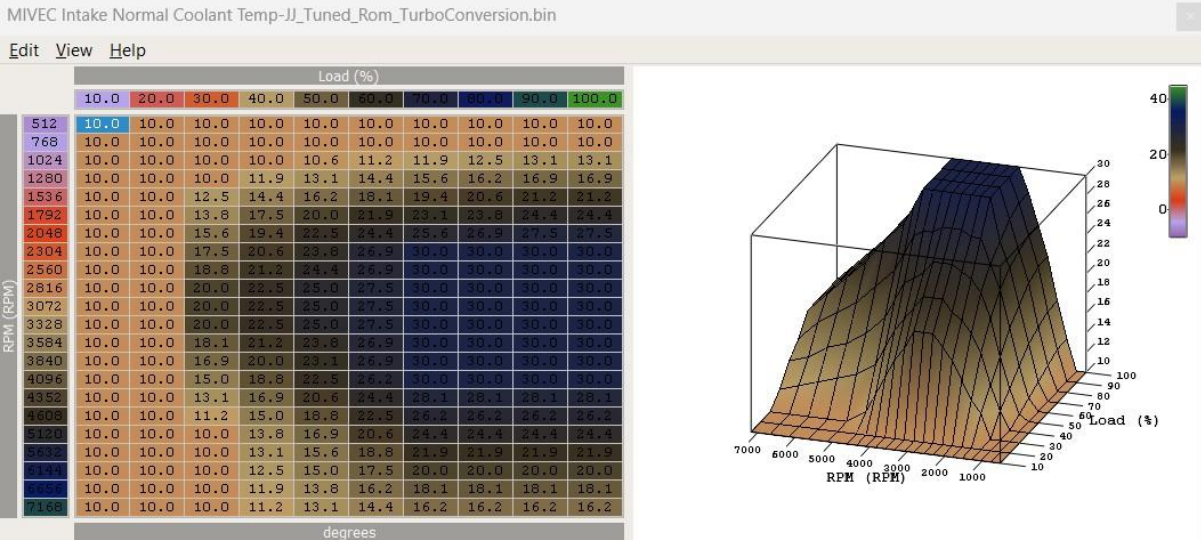
Starting IPW (After Engine Fires)

Startup Enric... ✕

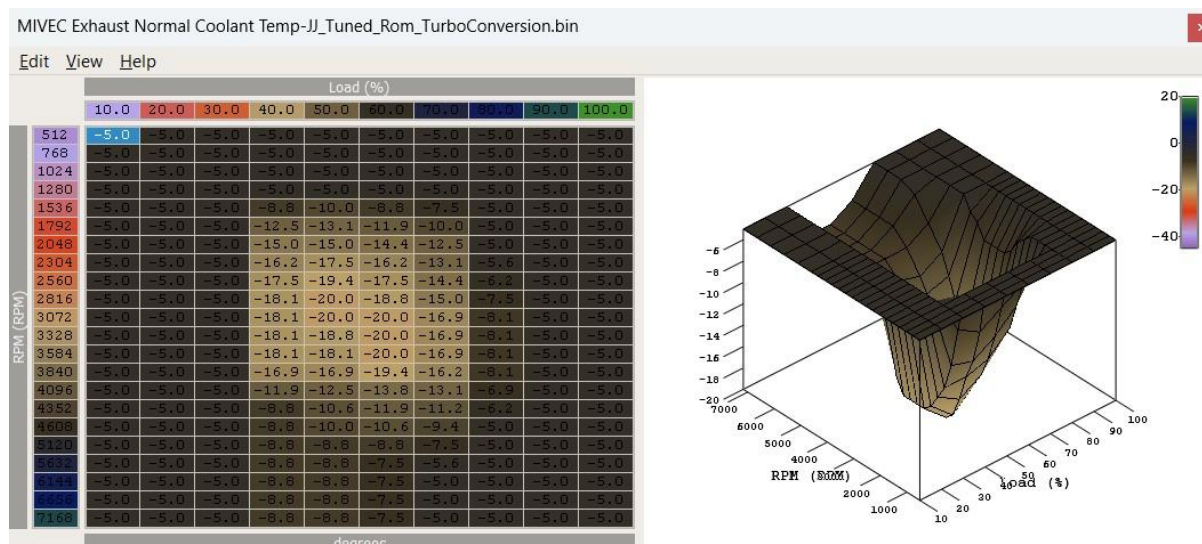
Edit View »

ECT (Celsius)	-32	3.469	Enrichment
	-18	3.000	
	-8	2.703	
	7	2.703	
	20	2.500	
	34	1.953	
	50	1.703	
	77	1.312	
	82	1.125	

Startup Enrichment IPW Adder v ECT



Mivec Intake Start Base Map



Mivec Exhaust Base Map

The Maps Displayed In The Screenshots Provided Are Only The Starting Point For A Proper Turbo Conversion Tune. While These Adjustments Lay The Groundwork For Injector Scaling, MAF Rescaling, And DTC Disabling, They Do Not Represent The Full Scope Of Calibration Required For Safe And Reliable Performance.

A Complete Tune Involves Many More Layers Of Adjustment, Including Advanced Fueling Strategies, Timing Optimization, Knock Control, MIVEC Fine Tuning, And Multiple Load-Based Corrections. These Elements Must Be Addressed With Precision And Experience.

For This Reason, It Is Strongly Recommended That A Tuning Specialist — Such As Myself — Reviews And Finalizes The Calibration. Only Through Professional Oversight, Datalog Review, And Incremental Refinement Can A Turbocharged Mitsubishi Lancer Achieve Maximum Power While Maintaining Reliability And Engine Safety.

Remember: The Maps Shown Are The Start, Not The Finish. Trust A Qualified Tuner To Take Your Build From Baseline To Fully Optimized.



Best of Luck To You All!
~ JJ Roberts/AlphaTune101