

TDI TURBOSTART TWO™
SMART STARTER

ENGINE AIR START SYSTEM



A Smart, Integral Start System for Engines up to 110 Liters

TDI
TECH DEVELOPMENT
www.tdi-turbotwin.com

TURBOSTARTTWO™

The Smart Air Start System with Built-In Control Logic for Engines up to 110 Liters

Why a “Smart” Air Starter?

What if an air starter could “think” for itself... and provide even greater reliability and efficiency? That’s exactly what *TurboStartTwo* does. Its unique integrated control logic provides a sort of “ESP” (electronic starter protection) which prevents common types of turbine starter damage. Premature starter re-engagements (pinion crashing) and over-speed (cranking the starter long after the engine has started) are eliminated using TDI *TurboStartTwo*. Air efficiency is enhanced too, because the air is turned off at the correct time on *every* start... saving valuable starting air on critical fixed volume applications.

Power is Nothing Without Control

TDI found a key to greater turbine air starter durability is attention to controls. Improper starter automation, or poor operator judgment, can result in excessive

starter wear, damaged starter pinion gears, damaged engine ring gears, wasted air, or worse... costly downtime and repairs.

TurboStartTwo is a low cost, easy solution at sites experiencing starter control problems or operator mistakes.

Starting Should Be a No Brainer

TurboStartTwo takes the guesswork out of selecting the correct air starter and system components. The same is true on your engine starting procedures. No thinking about starter engagement/disengagement, RPM settings, or proper timing between successive start attempts (re-engagements). A common-sense starter lock-out (from a running engine) is all that is needed. Install *TurboStartTwo*, and forget about the rest. No thinking required.

Everything You Need in One Box

TurboStartTwo is a compact air starting module, a *complete assembly* that includes: 1) a powerful air motor; 2) built-in controls with pre-programmed logic; 3) a flow-matched relay valve; 4) an electric solenoid; 5) an integral muffler; 6) both pilot air control lines/fittings; 7) a simple plug-in interface to your engine controls. 8) even an *emergency* manual bypass provision, allowing you to start *just* on air if need be. When you call, a TDI expert provides the correct starter part number for your engine. The site supplies control voltage (a power supply) and starting air. That’s it! Three bolts, one hose connection, plug it in and go!



International OEMs have specified TurboStartTwo for nearly two decades. It’s performance (TDI Series 45/46) is well-documented on marine applications worldwide.

OEMs Can Now Streamline Starter Selection, Installation & Production

TurboStartTwo is literally a complete “plug-and-play” attachment on the manufacturing shop floor. Just one box, one part number, and a five minute installation. Done!

Compare TDI’s “one box” solution to the hassles and costs of sourcing and selecting many separate starting system parts from numerous suppliers followed by receiving, stocking, staging and piecing these together on *every* engine. Not to mention managing and supporting all of this “stuff” for your dealers and customers. We think many engine and equipment manufacturers already know what we know... *Simplicity saves time and money!*

A “Value-Add” Solution for Engine Packages

Tell your engine dealer how *TurboStartTwo* adds value for your customers. If you still can’t get it from the engine manufacturer,

order your engine without a starting system, and you provide profitable air starter upgrades from TDI. This integral start system makes selection and installation a simple, hassle-free order. Then, right out of the box it's three bolts, two wires to plug in, and one air supply hose... 3-2-1 and you're done. You save time and cost and your customers receive a rugged, powerful and efficient air starting system—perfectly matched to the engine application.

Upgrade from Vane-Type to Turbine Air Starting

In the aftermarket, safe controls and simplicity make switching from vane-type starters to *TurboStartTwo* a smart move. Once on your engine, trouble-shooting or change-outs take minutes, not hours. Operators can't easily damage the starter, so your new TDI air starter can last 3-to-4 times

longer than conventional vane-type starters. The maintenance and mess of lubricators goes away, and quieter starter operation will be noticed. Improved air efficiency, power and reliability are additional benefits gained by using TDI—the one turbine starter brand distinguished as *Most Reliable in the World's Harshest Environments*.

No Vanes... No Vane Problems

TDI's vane-less motor design eliminates swelling, freezing, sticking, breaking or wearing of vanes. TDI's exclusive *open air path* turbine motor tolerates moisture and contaminants better than any other.

No Lubricators... No Kidding

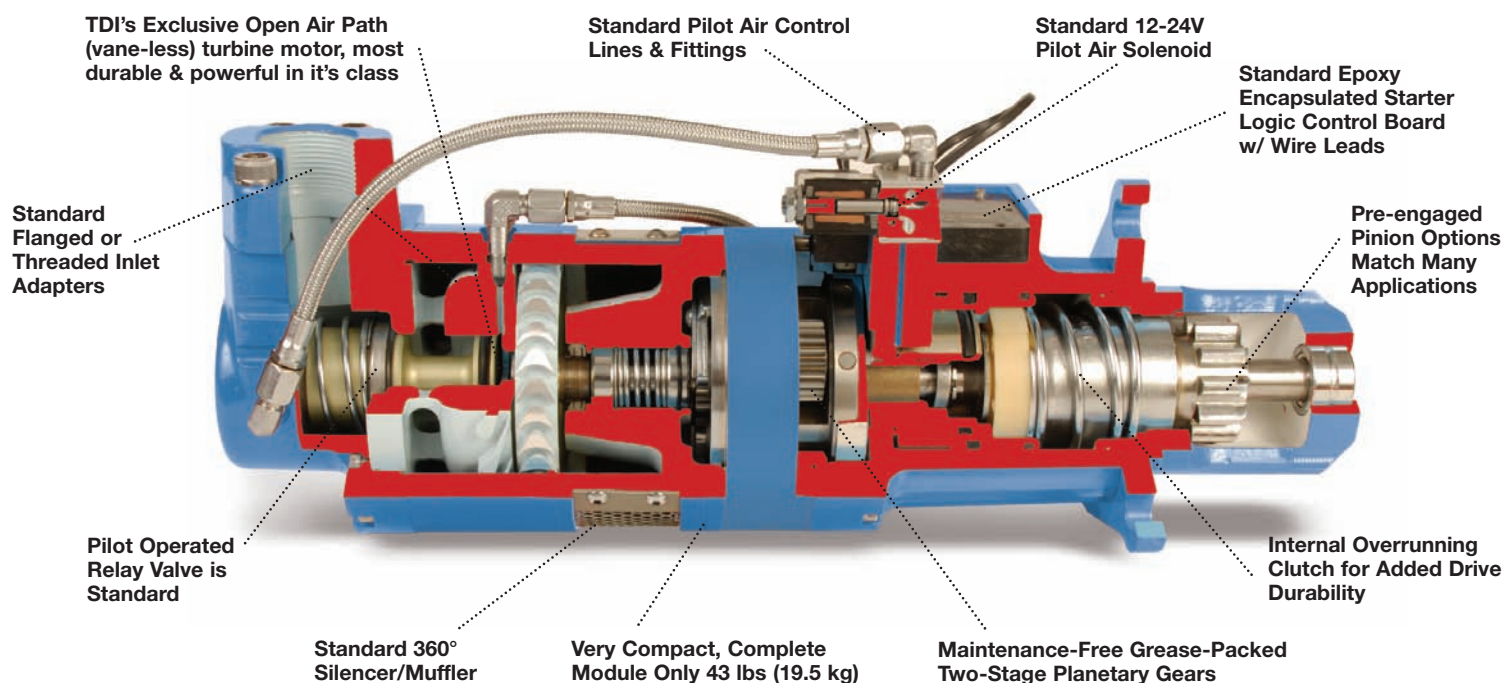
To eliminate the maintenance and mess of starter lubricators, TDI made sure that none are needed.

TDI starters are sealed and greased-packed for life. So, starter exhaust is clean (no messy, hazardous oily residues) while the integral muffler makes it quieter too.

Compact, Lightweight, Very Powerful

Weighing only 43lbs. (19.5 kg.) a complete *TurboStartTwo* air starter installation or replacement easily becomes a one-person job, even in the tightest spaces. But don't let their compact size fool you. Like our *TurboTwin* models, these advanced TDI air starters pack a serious punch... producing more class leading torque and horsepower than air starters weighing twice as much.

TurboStartTwo models are used to start diesel engines up to 110 Liters in displacement.



Even Greater TDI Reliability, Using Modern Control Logic

Shouldn't your air starter last the life of your engine? We think so. So we asked how. TDI has found that the vast majority of air starters are repaired or replaced because of *damage*... not *wear*. So we asked why.

If you have ever turned the start key on your car or truck... while it was *already* running... or kept the key turned on after the engine is running? You may have heard a terrible racket under the hood, the sound of your starter being thrashed by this abuse. Or maybe not. Because many late model cars and trucks now feature

logic based "starter protection" that prevents these kinds of mistakes. It's why 60,000-100,000 mile powertrain warranties are "the norm" these days.

Now, TDI is first again... by providing this advanced automotive technology for industrial engine air starter customers. Our customers already know when properly operated, free of human error, TDI starters last up to five years between servicing—three-to-four times the life of ordinary starters. That's the kind of real value TDI customers expect, and can get right now.

SPECIFICATIONS

Air Use Only

Engines up to 115L (7000 ci.) Displacement.
(See application guide or contact TDI)

- Controls** - 12-24VDC Elec. Over Pilot Air
- Manual (Emergency) Pneumatic By-Pass
 - Automatic Crank Disconnect (Over-Speed Shut Down)
 - Anti-Short Cycle Logic

Max Output

- 58HP (43Kw), 2800 Max Pinion RPM
- 325 Lb./Ft. (440 Nm)

Operating Pressure (Minimum - Maximum)

- 40 PSIG 1 (2.75 bar) - 150 PSIG (10.3 bar)

Air Consumption (Constant at Fixed Pressure)

- Minimum - 372 SCFM (68.4 Nm³/hr.)
- Maximum - 1241 SCFM (2111 Nm³/hr.)

Weight - 43lb (19.5 kg)

Air Quality Requirements/Recommendations

- 400 Micron (40 Mesh Y-Strainer Upstream)
- No External Lubrication Used (Grease-Packed for Life)

Mounting - SAE 3 Std. (Others on Request)
Over-Hung Pinion Available (Model 46MB)

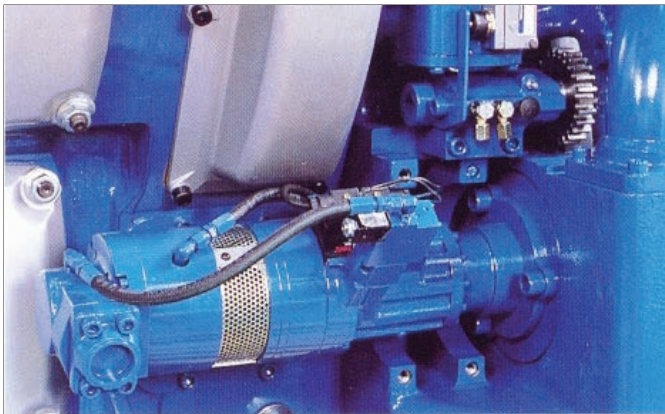
Pinion Gears & Rotation - (6/8P, 11T Std.) RH (CW) or LH (CCW) Other by Request

Quick Service Kits

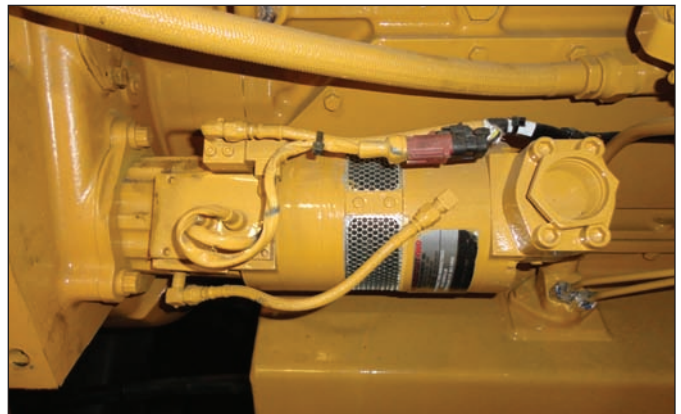
- Valve & Electronics Service Kit
- Starter Drive Service Kit
- Starter Overhaul Kit

TDI Flow-Matched Pressure Regulator

- Recommended for fixed volume/critical air starting capacity requirements, and/or regulatory agency compliance/approvals.



TurboStartTwo on a Wärtsilä W200 Engine.



TurboStartTwo on Caterpillar C32 engine.

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Anything Less Than a TurboStart is a Compromise.

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