

(D)

THE BLACKSTONE T.P.T No. 81003 Club ownership of this engine came through a members desire to have a big engine. David Bradley searching for his goal located the Blackstone, which is a two cylinder Horizontal 154.H.P. diesel. It was one of two engines that had been used to pump water at Hesso from the morgan, Whyalla pipeline to Woomera. Unfortunately for David the owners, the Defence Support Centre Woomera, requested that the Blackstone be donated to a restoration club With the condition that it be suitably displayed and the donor be acknowledged. In April 1993 the A.H.M.R.C. was notified that they would be the successful recipients of the engine plus a 31/2 H.P. lister C.S. engine direct coupled to a Hamworthy air Compressor for starting the Blackstone. Numerous new and used spare parts would be made available for possession. Early in September 1996 some club members went to Hesso to dismantle the engine house and the engine. This was timed to coincide with the removing of the other engine which was to go to Woomera as a static display to commemorate the service it had given to the residents of Woomera.

The Australian Army had been contacted and agreed to do an exercise in transportation and duly delivered the engine spare parts, two 6" Multistage pumps plus a 6 cylinder Dorman diesel coupled to a 30 K.V.A. generator to David's shed at Birdwood to be stored for up to 12 months waiting a suitable time for reassembly. Because of its size and weight no home was found and there was a growing concern that David's hospitality had to be extended for another 12 months. A decision was made to store the engine at Glen Liebelts It would be in the open under tarps The engine was relocated again November 98. Just prior to the shift, an old drilling platform with 4 large hydraulic rams was found and was being considered as a means of transporting the engine to and from display sites. It was purchased in June 1999 and taken to Trevor Kelley's yard where several busy bee days were held involving many club members See pics. 56789 9 a,b, c,d, The platform was stripped of excess superstructure and fittings it was sanded down and primed , The rams were removed and extended for a visual inspection as to their condition it was decided To fit a stop to prevent the bottom inch of rails passing through the seals. . A Wisconson engine was obtained and coupled to hydraulic pump then fitted to the platform. Four load control valves were installed, an oil tank and a 4 spool valve completed the hydraulic system Next the lister diesel and air compressor were bolted to the platform this had been tested By club member J.Elliott. The air receiver was then fixed in place. Some very smart calculating was done to make sure the engine was going to fit in the chassis ,This was left to Trevor as we finished up with 1/2" clearance in some critical areas. Work was spasmodic due to working in the open difficulties ranging from fire risk from welding and grinding to just being to wet to work and also fitting into ones personal free time. Eventually the work force dwindled down to 3 members, Neville Baughan Trevor Kelley and Des Kotz .which proved to be a suitable number of people working together and not getting in each others way. Came the day when the fly wheel which weighs 21/2 tons was to be fitted to the cranshaft and the whole Engine lifted and positioned on the chassis, this was testing time,.. A cheek on the hydraulics was made and they presented no problems.

At last it was starting to look like a engine the 3 foot by 22 V belt pulley was taken to Ben Wye engineering for the 5 1/2" diameter shaft to be pressed out shortened and machined to make an outrigger support for the flywheel ..see pic 18.. This was fitted and keenness to try and start the Blackstone was developing We connected the air line to the engine built up the pressure to 110 p.s.i. injectors primed, opened the valve, but disappointment. Although No. 1 cylinder turned the fly wheel there was air escaping back through The inlet of No.2, some thought and investigation later it was discovered that at some time water had got into the starting valves which showed some corrosion, these were lapped in the proper setting made and yep great excitement The Blackstone **fi**red up for the **fi**rst time in how many years ?????????? Work continued exhaust,governor remodeld tachometer near the working gauges Oil pressure temperature together with exhaust temperatures and lot of minor adjustments

AT LAST IT WAS READY FOR POP. 2004

Power of the Past ..

Mt Barker South Australia

Special thanks to all these people
The Defence Support Centre Woomera
Australian Army Corps.
Castrol Oils
Isco Tanks Littlehamton
Kelley Diesel Services Woodside
Males B.P. fuels Hahndorf
Mount Barker Crane Hire
Mount Barker Freight Lines
Private resorces from the shed of Baughan Kelley Kotz
Sheehans Hardware Naime
B,Thiele Family Hahndorf
Thomas Gas Aldgate
F. Walsh Drilling Littlehwnpton
Ben Wye Engineering Summertown

Some interesting specifications of the TPT Blackstone.

Bore 1 1/4"

Stroke 1 1/2"

Compression Ratio 13.75:1

Weight of engine less flywheel 8892 LB. Flywheel 5612 LB

Piston speed @ 420 RPM - 1085 FT/min

Cost of some replacement parts in 1980 AUS \$

Large end bolt \$154.41

Castle nut \$ 26.76

Shims \$ 2'3. 81
Cylinder Liner \$2088.33
Compression rings \$ 26.99
Oil rings \$ 42.31
Scraper rings \$ 32.35

Working History

Installed at Hesso in 1957
Deconimissioned in 1992
27/7/82 Engine hours 108168, 10,000 since last overhaul
AV. Oil consumption 2 pints/24 hours
AV. Fuel 6 Gallons/hour
Oct 83 Engine hours 113629
AV. Oil consumption 5 Gallon/week
AV. Fuel 5.5 Gallons/hour

At the time of writing the year of manufacture is not known possibly somewhere in the late 1940's. The first TPT was built in 1939. There is an unfounded belief that this engine was first used in a gold mine in W.A.

In the 1950,s Blackstone & Co.Ltd. was producing hundreds of P. Type engines mainly for export and mostly for irrigation pumping. In South Australia, far from the 'cold war' chills of Europe,frantic efforts were made by Britain to enter the Nuclear Club, and to produce rockets capable of the del ivery of nuclear weapons This effort was centred on the outback facility near the purpose built town of Woomera. Water was a major problem in this and country, and a crash program was instituted to Get water from the Morgan-Whyalla pipeline which supplied River Murray, water to The city of Whyalla and many points between The pipe line was tapped at Pt. Augusta and connected to Woomera. We understand that to provide pumping capacity,a pair of Blackstone T.P.T. engines each with a 6 inch INDENG, multistage Spiroflow pump were acquired. They were installed on the pipeline at the tiny railway siding of Hesso, 53 kin. north of Pt. Augusta Engine No.TT81003 is one of those engines. The other now stands at the Visitor information bay outside Woomera. These pumps delivered waterat the rate of 650 gallons per. Minute 29551 Ipm. Against a head of 473 ft. 144m. A former engine driver at Hesso told members That when the engines were working hard the ground around the pump house Shook and it was difficult to stay in the pump house for long

Technical Data -Engine Types -TP & TPT

General.

	British Units	Metric Units
Bore	4"	299.2 mm.
Stroke	15 1/2"	394.0 mm.
BMEP at full load	86.3lb./sq.in.	6.02hg./sq.cm.
Compression ratio	13.75:1	
Weight of engine unit less flywheel and outer bearing	5552lb. 8892lb.	2510Kg 4041K
Spill setting	17deg BTDC	
Piston speed @ 420 rpm	1085ft./min.	522cm./sec.
Foundation block minimum	8.9 cubic Yds.	
Exhaust temperature	860deg F	
Starting	Compressed air	
Lubricating oil sump capacity	148 gallons	670 litres

Efficiencies.

Thermal (on BBP full load with fuel 1900BTU/lb.)
34/34% 34/35%.

Mechanical 82% 82%.

Pressures.

Maximum cylinder pressure	700lb./sq.in.	49.2 Kg/cm ²
Injection pressure	2900 "	200.4 "
Compression pressure	480/520"	3 3.7/3 6.5"
Starting air pressure (maximum)	320"	22.5"
Starting air pressure (minimum)	150"	10.69"

Bearings.

Crankshaft (governor side)

Diameter	63/4"	171.45 mm.
Length	67/16"	163.2 mm.
Maximum pressure	1700lb/squ.in.	119.5 Kg/cm ²

Center

Diameter	63/4 in	171.45 mm.
Length	33/4 in.	92.25 mm.

	Maximum pressure	1700lb/squ.in.	119.5Kgcm ²
	Flywheel side		
	Diameter	63/4	171.45mm
	Length	713/16 in	198.5
Large end	Maximum pressure	640 Ibs/sq.inch	45.0 Kg/cm ²
	Diameter	7 ¼ in	184.1 mm.
	Length	6 1/8y@	13 8. 0 mm.
Small end	Maximum pressure	1630 Ibs/sq.inch	115 5 Kg/cm ²
	Diameter	3 ¾	92.25 mm.
	Length	4 3/41	20.8 mm.
Connecting rod bolts	Maxi pressure	4070 Ibs/sq.inch	286 Kg/cm ²
	Length	43 in	10 1. 6 mm.
	Diameter	7/85	22.2mm.
	Maximum stress	8900 Ibs/sq.inch	626 5 Kg/cm ²

Cooling and Temperature details.

Cooling water Maximum outlet temperature 180' F

Normal outlet temperature 160' F

Lubricating oil Maximum temperature 160' F

Normal temperature 140' F

Working clearances. (in thousandths of an inch

	Initial	Permissable max.
Main bearings to crankshaft Crank end play	4.5 - 6.5	15
Large end bearing to crankshaft	12 - 22	40
Small end bearing to gudgeon pin	3.5 - 4.5	10
Piston skirt to cylinder liner	8 - 11	25

Piston nose to cylinder line	69 – 73	-
Piston ring side clearance	15 - 8	20
Piston ring side clearance 2	5 - 8	20
Piston ring side clearance 3	5 - 8	20
Piston ring side clearance 5	5 - 6	20
Piston ring side clearance 6	3 - 6	20
closed gap at head of cylinder liner stem to guide	35 - 42	55
valve stem to guide	8 - 11	20
crown to cylinder head	100 - 150	
tappet clearance (cold)	10 - 12	
tappet clearance (hot)	8 - 10	

