LAPORAN *ON THE JOB TRAINING*

DI AKADEMI PENERBANGAN INDONESIA BANYUWANGI

01 APRIL 2024 - 28 JUNI 2024

Disusun Oleh :

DONY ARIEFIO

NIT 30421033

PROGRAM STUDI DIPLOMA 3 TEKNIK PESAWAT UDARA

POLITEKNIK PENERBANGAN SURABAYA

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LEMBAR PERSETUJUAN

LAPORAN *ON THE JOB TRAINING (OJT)*

DI AKADEMI PENERBANG INDONESIA BANYUWANGI

Oleh :

DONY ARIEFIO

NIT. 30421033

Laporan *On The Job Training (OJT)* ini telah diterima dan disetujui sebagai salah satu syarat penilain *On The Job Training (OJT)*.

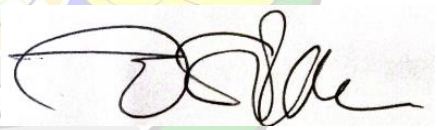
Disetujui Oleh :

Pembimbing Lapangan

Erfan Fahrudi Nazarrudin, A.Ma.,

AMEL NO. 10245

Dosen Pembimbing



Dr. Gunawan Sakti, S.T, M.T

NIP. 9881001 200912 1 003

Mengetahui,

AMO 145 ICPA Manager

AKADEMI PENERBANGAN INDONESIA

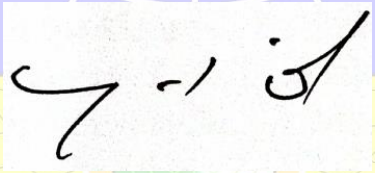
RAHMATANTO IMANTHIAR. A.Ma

AMEL NO 6145

LEMBAR PENGESAHAN

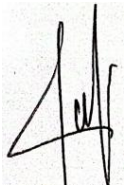
Laporan *On The Job Training* telah dilakukan pengujian didepan Tim Penguji pada tanggal 28 Juni 2024 dan dinyatakan memenuhi syarat sebagai salah satu komponen penilain *On The Job Training*

Tim Penguji :

Ketua	Sekretaris	Anggota
		
Dr. SUYATMO, ST, S. Pd, MT	CHOLIK SETIJONO, SiT, MM	Dr. Gunawan Sakti, ST. MT
NIP. 19630510 198902 1 001	NID. 19701109 201601 08 009	NIP. 9881001 200912 1 003

Kepala Program Studi

D III Teknik Pesawat Udara



NYARIS PAMBUDIYATNO, S.SiT, M.mTr

NIP. 19820525 200502 1001

KATA PENGANTAR

Dengan menyebut nama Allah SWT Yang Maha Pengasih lagi Maha Penyayang, kami panjatkan puja dan puji syukur atas kehadirat-Nya, yang telah melimpahkan rahmat, hidayah, dan inayah-Nya kepada penulis, sehingga penulis dapat menyelesaikan laporan *On The Job Training (OJT) di* Akademi Penerbang Indonesia Banyuwangi dapat diselesaikan dengan baik.

Penyusunan laporan *On The Job Training (OJT)* memiliki maksud dan tujua sebagai cara kami untuk lebih mendalamai dan mengimplementasikan ilmu yang telah didapatkan dalam pelaksanaan *On The Job Training*. Selain itu juga bermanfaat unutk menambah wawasan dan pengetahuan bagi para pembaca, khususnya bagi pribadi kami.

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1. Bapak Ahmad Bahrawi, SE, MT., selaku Direktur Politeknik Penerbangan Surabaya.
2. Bapak Capt. Daniel Dewantoro Rumani selaku Direktur Api Banyuwangi.
3. Bapak Rahmatanto Imanthiar,. Selaku *Manager of* AMO 145 ICPA
4. Bapak Nyaris Pambudiyatno, S.SiT, M.mTr, selaku Ketua Program Studi Diploma 3 Tekik Pesawat Udara di Politeknik Penerbangan Surabaya.
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7. Seluruh dosen dan instruktur pengajar Politeknik Penerbangan Surabaya yang telah membimbing kami selama ini.
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9. Seluruh engineer dan mekanik Hanggar C Akademi Penerbang Indonesia Banyuwangi.
10. Bapak Sabam Danny Sulung, selaku Chief Line/Hase Maintenance Hanggar C Akademi Penerbang Indonesia Banyuwangi.
11. Seluruh sahabat, senior, junior, mentor, motivator, dan penyemangat dalam menempuh pendidikan di Politeknik Penerbangan Surabaya.

Tentunya laporan ini masih jauh dari kata sempurna. Atas kesalahan dan kata – kata yang kurang berkenan, kami memohon maaf. Saran dan kritik membangun kami harapkan demi karya yang lebih baik di masa mendatang.

Banyuwangi, 28 juni 2024

Dony Ariefio

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OJT (*On The Job Training*)

Kegiatan pembelajaran praktek maupun teori secara langsung pada lingkungan kerja dengan supervise yang kompoten dibidangnya.

API (Akademi Penerbang Indonesia)

Perguruan tinggi dibawah naungan Kementrian perhubungan yang terletak di Banyuwangi.

AMM(*Aircraft Maintenance Manual)*

Maintenance pada pesawat dilakukan berdasarkan *maintenance manual* sesuai dengan yang diberikan *manufacture.*

OH(*Overhaul Manual)*

Overhaul pada pesawat dilakukan berdasarkan *overhaul manual* sesuai dengan yang diberikan *manufacture* untuk dilakukan *maintanance* bagian *power plant.*

GEA 71 (*Garmin Engine Airframe*)

Salah satu komponen LRU (*line replaceable unit*) yang berfungsi sebagai penerima data dari sensor *engine* dan *airframe*.

LP3B (Loka Pendidikan dan Pelatihan Penerbang Banyuwangi)

Sebuah fasilitas pendidikan pilot kedua yang dimiliki pemerintah setelah sekolah serupa di Curug, Tangerang, Banten yang berdiri pada 1952.

ICAO (*Internatonal Civil Aviation Organization*)

Sebuah lembaga Perserikatan Bangsa-Bangsa yang didirikan menurut Konvensi Chicago 1944 tentang Penerbangan Sipil Internasional

AMO (*Approved maintenance organizations*)

Organisasi yang disahkan oleh DGCA untuk melakukan perawatan, perbaikan dan modifikasi pesawat sesuai dengan cakupan kemampuannya

AFML (*Aircraft Fligh Maintenance Logbook*)

Buku wajib terbang yang ada di pesawat yang sedang beroperasi. Buku ini berisi data catatan terbang pesawat yang ditulis oleh engineer dan pilot.

BAB 1
PENDAHULUAN

Politeknik Penerbangan Surabaya merupakan perguruan tinggi vokasi yang didirikan dibawah Badan Balai Pengembangan Sumber Daya Manusia Perhubungan yang telah di setujui oleh Direktorat Jendral Perhubungan Udara dengan tujuan untuk memenuhi kebutuhan sumber daya manusia yang profesional salah satunya Diploma III Teknik Pesawat Udara. Melalui progam metode pembelajaran yang dilakukan berupa teori di ruang kelas dan simulasi praktek di hanggar, serta praktek kerja lapangan yang disebut *On the Job Training* (*OJT*).

Kegiatan *OJT* merupakan salah satu program perkuliahan yang ada di Politeknik Penerbangan Surabaya yang dilaksanakan berdasarkan kurikulum dan silabus yang berlaku, guna untuk memastikan kesesuaian pengalaman baik teori maupun praktek yang telah di dipelajari di Politeknik Penerbangan Surabaya untuk diterapkan di tempat *OJT* agar kelak dapat segera menyesuaikan diri dengan lingkungan kerja. Selain sebagai persyaratan menyelesaikan studi program Diploma 3 Teknik Pesawat Udara dalam pemenuhan jam praktik lapangan khususnya di *Line Maintenance* juga berguna menambah wawasan penerbangan di tempat *OJT* serta untuk memungkinkan taruna memperluas jaringan atau relasi terhadap senior profesional guna memperoleh informasi seputar lowongan pekerjaan setelah lulus.

Kesempatan *OJT* ini, penulis melaksanakan kegiatan tersebut di Hanggar C sekolah Akademi Penerbangan Indonesia (API) yang berada di Banyuwangi selama 3 bulan mulai dari april sampai dengan juni, API banyuwangi telah bekerja sama dengan Poltekbang Surabaya mulai pada tahun 2019. Hanggar API Banyuwangi menyediakan fasilitas perawatan *line maintenance* di hanggar serta memiliki pesawat latih seperti : tipe Cessna 172S, Piper Seneca V, dan Cessna 172 Seaplane

Selama proses kegiatan OJT hingga selesai diharapkan taruna dapat menguasai dan paham seperti : sistem *piston engine*, Basic garmin 1000, dan *airframe*, serta *troubleshoot* pada pesawat yang mengalami *trouble* baik *engineer* yang menemukan atau mendapatkan laporan dari pilot guna untuk mempermudah

ujian *basic license.* Sebagai bukti dan bentuk pertanggung jawaban telah dilaksanakannya giat OJT yang berlokasi di API Banyuwangi, maka penulis perlu menyusun laporan OJT sesuai dengan pedoman penulisan laporan OJT.

Laporan OJT disusun murni bedasarkan pengamalan penulis selama OJT. Selain sebagai bukti dan pertanggung jawaban, Laporan OJT yang disusun juga memiliki tujuan yaitu sebagai referensi bagi yang akan OJT di lokasi hangar C API Banyuwangi.

1.2 Maksud dan Tujuan

1.2.1 Maksud

Adapun maksud dilaksanakannya On The Job Training (OJT) berdasarkan pedoman OJT sebagai berikut

1. Memperoleh serta menambah pengalaman nyata dari Akademi Penerbangan Indonesia Banyuwangi (API Banyuwangi) terkait sebagai upaya untuk mengembangkan ilmu pengetahuan serta keterampilan dalam melakukan *maintenance* pada pesawat udara.
2. Melakukan kegiatan OJT sebagai syarat akademik yang telah diprogram oleh lembaga pendidikan (Poltekbang Surabaya)
3. Peserta OJT mampu menyesuaikan diri dengan budaya kerja dalam Lembaga penyelenggaraan perawatan pesawat udara.

1.2.2 Tujuan

Tujuan dilaksanakannya On The Job Training (OJT) berdasarkan pada pedoman OJT yang terbagi menjadi dua yaitu tujuan umum dan tujuan khusus, sebagai berikut :

1. Tujuan Umum

a. Setelah melaksanakan OJT diharapkan taruna akan memperoleh pengalaman nyata dari Akadami Penerbangan Indonesia (API Banyuwangi sebagai upaya pengembangan ilmu pengetahuan khususnya di dunia penerbangan.

b. Mengembangkan hubungan kerja sama dan kemampuan sosialisasi yang baik sesama taruna dan tenaga kerja pada unit kerja Politeknik Penerbangan Surabaya maupun pada API Banyuwangi.

2. Tujuan khusus

a. Peserta OJT mampu mengaplikasikan apa saja yang telah dipelajari segala pengetahuan baik teori maupun praktik terkait teknik pesawat udara yang diperoleh selama mengikuti Pendidikan di Politeknik Penerbangan Surabaya, sehingga membentuk karakter yang disiplin dan berkompeten.
b. Memperoleh pengalaman bekerja yang sebenarnya selama di tempat OJT API Banyuwangi
c. Menambah karakter kedisiplinan dan tanggung jawab dalam melaksanakan OJT
d. Memperluas wawasan dan relasi sebagai calon tenaga kerja perusahaan atau industri

BAB II
PROFIL LOKASI OJT

2.1 Sejarah Akademi Penerbangan Indonesia

Akademi Penerbang Banyuwangi disingkat API Banyuwangi atau lebih dikenal sebagai Sekolah Pilot Banyuwangi merupakan salah satu perguruan tinggi kedinasan yang berada di bawah Kementerian Perhubungan Indonesia. Berawal dari nama Loka Pendidikan dan Pelatihan Penerbang Banyuwangi yang kemudian disingkat LP3 Banyuwangi yang merupakan Unit Pelaksana Teknis di Lingkungan Kementerian Perhubungan yang berada di bawah dan bertanggung jawab kepada Kepala Badan Pengembangan Sumber Daya Manusia Perhubungan dan secara teknis operasional dibina oleh Kepala Pusat Pengembangan Sumber Daya Manusia Perhubungan Udara yang ditetapkan dengan Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 73 Tahun 2013 tentang Organisasi dan Tata Kerja Loka Pendidikan dan Pelatihan Penerbang Banyuwangi tanggal 04 September 2013.

Loka Pendidikan dan Pelatihan Penerbang Banyuwangi resmi berganti nama menjadi Balai Pendidikan dan Pelatihan Penerbang Banyuwangi, disingkat BP3 Banyuwangi pada tahun 20 agustus 2015, sesuai dengan Peraturan Menteri Perhubungan Republik Indonesia Nomor PM 123 Tahun 2015. Kemudian, BP3 Banyuwangi ditetapkan sebagai Instansi Pemerintah yang menerapkan Pengelolaan Keuangan Badan Layanan Umum (PK BLU) melalui Keputusan Menteri Keuangan Republik Indonesia Nomor 740/KMK.05/2016 tanggal 30 September 2016

Dengan telah ditetapkannya Balai Pendidikan dan Pelatihan Penerbang Banyuwangi sebagai organisasi pemerintah yang menerapkan Pengelolaan Keuangan Badan Layanan Umum (PK-BLU), sehingga organisasi tersebut ditata kembali melalui Peraturan Menteri Perhubungan Republik Nomor PM 95 Tahun 2017 tentang Organisasi dan Tata Kerja Balai Pendidikan dan Pelatihan Penerbang Banyuwangi tanggal 26 September 2017. Pada tahun 2019 berdasarkan Peraturan Menteri Perhubungan Republik Indonesia Nomor PM. 26 Tahun 2019 Balai Pendidikan dan Pelatihan Penerbang Banyuwangi berubah nama menjadi Akademi Penerbang Indonesia Banyuwangi,

2.2 Data Umum

2.2.1 Visi dan Misi

Visi

Lembaga pendidikan dan pelatihan penerbang yang unggul dan profesional serta berdaya saing tinggi di wilayah Asia Pasifik.

Dalam upaya mencapai visinya, Akademi Penerbang Indonesia Banyuwangi memiliki Misi sebagai berikut

Tabel 2. 1 Misi Api Banyuwangi

Misi

1.	Menyelenggarakan pendidikan dan pelatihan penerbang dan personil operasi penerbangan yang profesional sesuai standar internasional
2.	Menyelenggarakan pendidikan dan pelatihan untuk menghasilkan SDM dibidang penerbangan yang prima dan bermanfaat untuk kesejahteraan masyarakat
3.	Menyelenggarakan penelitian untuk perkembangan ilmu pengetahuan dan teknologi dibidang penerbangan serta pengabdian kepada masyarakat
4.	Mengembangkan kerjasama dengna lembaga dalam negeri maupun luar negeri
5.	Meningkatkan tata kelola lembaga mandiri, transparan, akuntabel efisien
6.	Mengembangkan kurikulum dan silabus program studi penerbang
7.	Menghasilkan lulusan penerbang yang mempunyai daya saing dan siap kerja pada industri penerbangan nasional dan internasional

2.2.2 Arti Lambang dan Logo Banyuwangi

Gambar 2. 1 *Lambang API Banyuwangi (Rafihan Alrasyid, 2022)*

1. Burung elang menghadap kedepan dengan sayap terbentang melakukan pendaratan dengan warna dasar kuning dan pita berwarna orange bertuliskan Banyuwangi dengan ornament vector Gajah Oling sebagai kearifan lokal Banyuwangi serta bahasa sansekerta ‘Madyasta Satyawada Sahwahita’

   Bermakna : bahwa API Banyuwangi dalam tugasnya melaksanakan pendidikan dan pelatihan untuk mencetak insan perhubungan yang Tangguh menyongsong perubahan global (nasional maupun internasional) dengan ceria, bahagia, energik dan optimis. Gajah Oling sebagai ikon khas Banyuwangi dengan filosofi ‘GAJAH’ merupakan binatang paling besar dan ‘OLING’ dalam bahasa osing berarti ‘MENGINGAT/ELING’. Sehingga maknanya adalah harus mengingat apa yang Maha Besar. Bahasa sansekerta ‘MADYASTA SATYAWADA SAHWAHITA’ bermakna API Banyuwangi mencetak insan perhubungan yang berdiri teguh dan bermanfaat bagi Nusa dan Bangsa.
2. Garis horizontal dengan indicator arah (heading) dengan warna dasar cokelat tua dan vektor landasan pacu (runway).

   Bermakna : API Banyuwangi mencetak insan perhubungan yang Tangguh dengan menjunjung aspek keselamatan, keamanan dan pelayanan serta kesesuaian hukum.
3. Pesawat melakukan pendekatan di landasan pacu beserta indikator posisi pesawat dengan warna biru angkasa.

   Bermakna : bahwa penerbang API Banyuwangi siap berkiprah dalam memajukan dinamika Dirgantara Indonesia secara mendunia.
4. Pesawat melakukan pendekatan di landasan pacu beserta indikator posisi pesawat dengan warna biru angkasa.

   Bermakna : bahwa penerbang API Banyuwangi siap berkiprah dalam memajukan dinamika Dirgantara Indonesia secara mendunia.

Gambar 2. 2 Logo API Banyuwangi

Logo Akademi Penerbang Indonesia Banyuwangi memiliki makna sebagai berikut:

1. Huruf A yang berbentuk pesawat kertas yang melambang keberhasilan API Banyuwangi saat ini yang berawal dari sebuah mimpi untuk mewujudkan sekolah pilot yang visioner.
2. Huruf P yang berbentuk taxiway menggambarkan proses perjalanan API Banyuwangi dalam mewujudkan impian.
3. Huruf I melambangkan sivitas akademika API Banyuwangi untuk memacu diri terus berinovasi. Pesawat seaplane pada
4. huruf I melambangkan API Banyuwangi pelopor sekolah pilot seaplane pertama di Indonesia.
5. Didominasi oleh warna orange dan biru yang memiliki makna semangat dan optimis yang tinggi serta dapat diandalkan dan bertanggung jawab

2.2.3 Fasilitas

Akademi Penerbang Indonesia Banyuwangi mempunyai fasilitas Pendidikan yaitu Gedung Operasional 1 dan 2, Gedung Simulator, Asrama, Kelas, dan Hanggar.

1. Fasilitas Hanggar Pesawat Udara

Akademi Penerbang Indonesia Banyuwangi memiliki fasilitas 3 unit hanggar pesawat udara yaitu Hanggar A, Hanggar B, dan Hanggar C. Ketiga unit tersebut dapat menyimpan pesawat dengan total kapasitas pesawat 37 pesawat. Untuk gambar 2.3 adalah hanggar A yang digunakan untuk menyimpan pesawat seaplane serta biasanya hanggar A ini disewakan. Hanggar B di gunakan untuk menyimpan pesawat yang akan di gunakan oleh penerbang serta memiliki fasilitas

ruang *briefing* penerbang sebelum *flight*. Hanggar C merupakan tempat melakukan maintenance perawatan dan perbaikan pesawat, baik berupa maintenance, penggantian komponen, cleaning, penggantian consumable part seperti filter oil, inspeksi ringan hingga tahunan, dan lain-lain.

Gambar 2. 3 Hanggar A

Gambar 2. 4 Hanggar B

Gambar 2. 5 Hanggar C

Pada Hanggar C juga memiliki fasilitas ruangan yg mempermudah engineer melakukan suatu pekerjaan. Diantaranya :

1. Ruangan *Tools*, untuk menyimpan *tools*, *special tools*, dan alat pendukung lainnya seperti vacuum, mechanic creeper seat, dll yang digunakan untuk membantu me lakukan maintenance pada pesawat

Gambar 2. 6 Ruang Tools

2. Ruangan *Storage & Spare Part*, untuk menyimpan komponen suku cadang pada pesawat seperti *magneto, batterai, cotter pin*, dll. Untuk pengelolaannya ruang tersebut harus dingin dengan batas limit 20°C, untuk penataan komponen *flammable* dengan komponen *consumable* atau barang habis pakai harus di pisah. Untuk barang listrik seperti batterai disimpan dengan dibungkus oleh plastik *ESD Anti-static*. Serta *storage* ban harus diputar agar tidak getas atau pecah, dari sdm sendiri agar dapat bekerja di *storage* harus sekolah *Dangerous Good*

Gambar 2. 7 Ruang Storage & Spare Part

3. Ruangan *Engineering,* tempat untuk penyimpanan rekaman data-data pesawat seperti Aircraft Fligh Maintenance Logbook (MLB), *engine ground run* serta untuk evaluasi dan merencanakan jadwal inspeksi pesawat yang akan dilaksanakan oleh para engineer dilapangan.

Gambar 2. 8 Ruang Engineering

2. Fasilitas Pesawat Udara

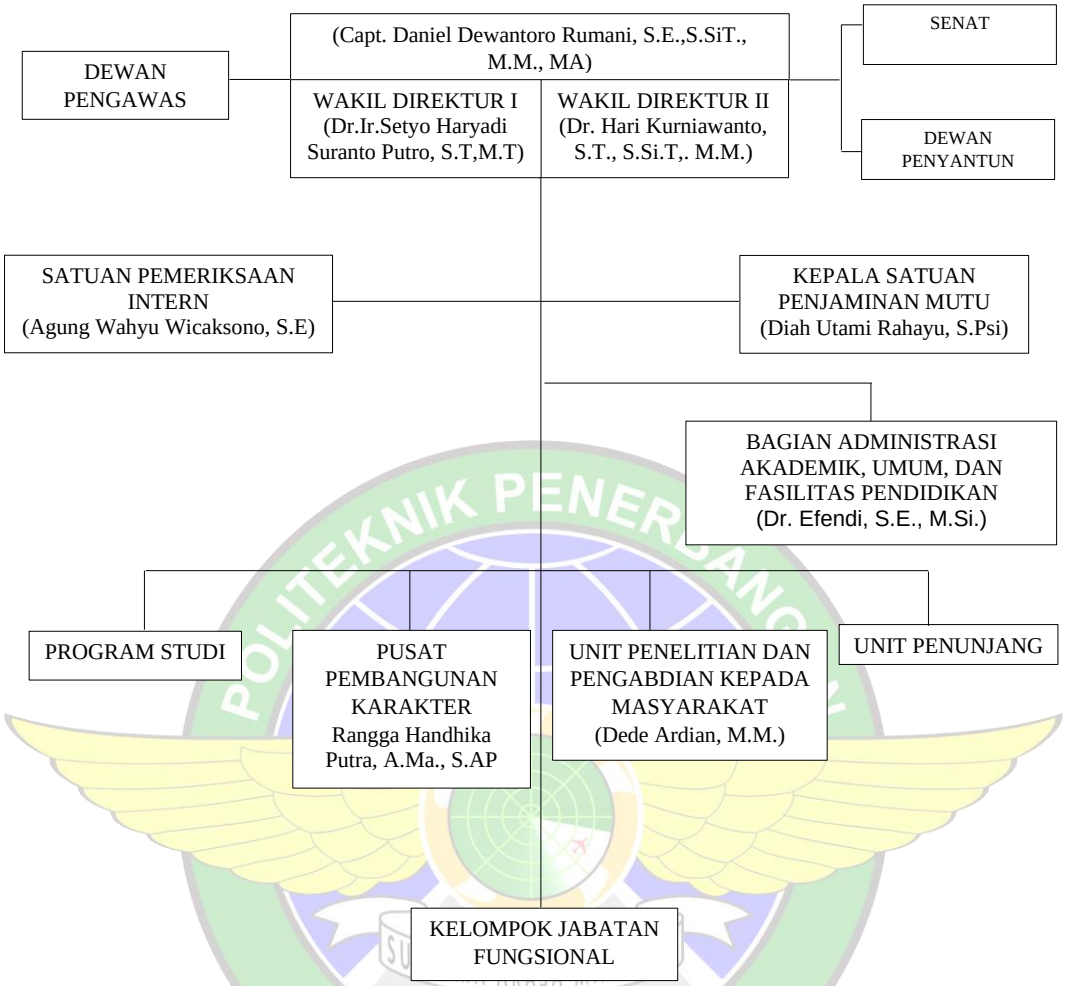
Akademi Penerbang Indonesia Banyuwangi memiliki fasilitas pesawat pendidikan yaitu 33 unit pesawat latih single engine Cessna 172-S dan 2 unit *multi engine Piper Seneca V* serta 2 unit pesawat Seaplane

Gambar 2. 9 Pesawat Cessna 172s Skyhawk

Gambar 2. 10 Pesawat Piper Seneca V

Gambar 2. 11 Pesawat Seaplane

2.3 Struktur Organisasi



Gambar 2. 12 Struktur organisasi

Berdasarkan gambar semua unit bertanggung jawab terhadap direktur Akademi Penerbang Indonesia Banyuwangi yang sekarang dijabat oleh Capt. Daniel Dewantoro Rumani, S.E., S.SiT., M.M., MA.,. Selaku pimpinan tertinggi bertugas mengambil kebijakan serta mengkoordinir segala bentuk kegiatan di lingkup API Banyuwangi. Tentunya tugas dan tanggung jawab yang besar tersebut dibantu dan didampingi oleh wakil direktur 1 dan wakil direktur 2 dalam memimpin pelaksanaan kegiatan. Sedangkan sub bagian admistrasi akademik ketarunaan dan sub bagian keuangan bertanggung jawab terhadap bagian administrasi akademik umum dan fasilitas diklat dalam mengatur dan mengelola keuangan, administrasi, pelayanan serta perencanaan bagi peserta didik.

Selain itu bagian fasilitas dan Pendidikan serta satuan pemerikasa internal bertugas dalam pengadaan maupun penyelenggaraan sarana dan prasarana sebagi media pelatihan calon penerbang. Kemudian pelaksanaan kegiatan kerohanian, konsultasi serta keolahragaan merupakan tanggung jawab daripada unit bagian pembangunan karakter API Banyuwangi. Pada bagan diatas juga terdapat unit penelitian dan pengabdian masyarakat. Merupakan tenaga pengajar yang diberikan tugas tambahan dalam kegiatan dibidang penelitian serta pengabdian kepada masyarakat Sebagai sekolah penerbang segala prosedur dan kurikulum API Banyuwangi harus berdasarkan dengan CASR 141 yang telah dikeluarkan oleh DGCA.

CASR 141 mengatur mengenai persyaratan dan standar pelatihan penerbangan termasuk fasilitas pesawat yang digunakan, prosedur, operasi keselamatan, sistem menejemen yang berkaitan dengan pelatihan penerbang baik swasta maupun komersial. Akademi penerbang Indonesia juga sudah memiliki sertifikat Approved Maintenance Organizations (AMO) terkait kinerjanya dalam melakukan perawatan, perbaikan, pemeliharaan preventif maupun perubahan pada pesawat udara. Hal ini sesuai dengan persyaratan dalam CASR part 145 dimana lembaga atau organisasi yang melakukan perawatan pesawat udara harus memiliki sertifikasi AMO yang dikeluarkan oleh Direktorat Jendral Perhubungan Udara.

BAB III
TINJAUAN TEORI

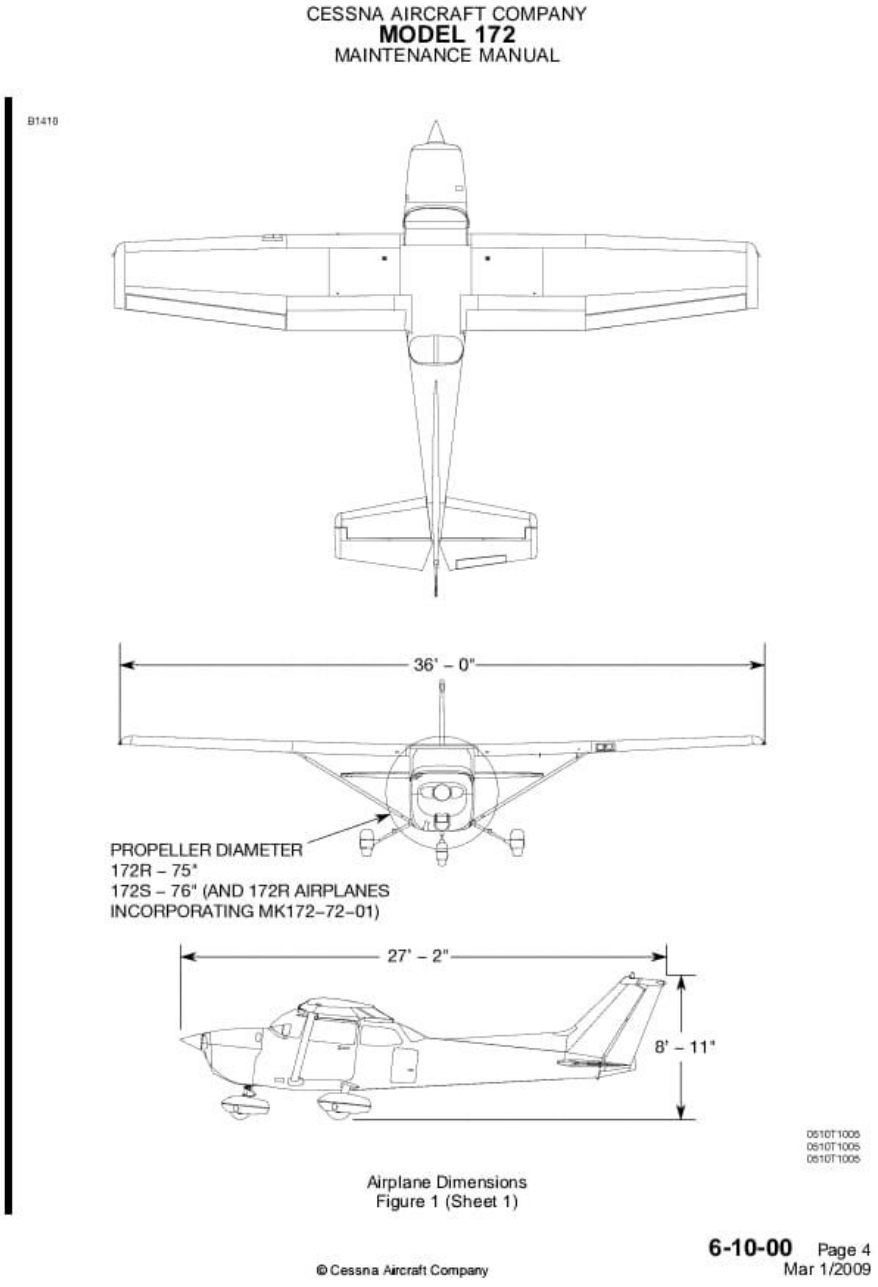
3.1 Cessna 172S Skyhawk

Cessna 172 Skyhawk merupakan pesawat piston engine paling popular yang pernah dibuat dan mendapatkan reputasi sebagai pesawat latih terbaik. Pesawat seri ini di motori dengan engine Lycoming four- cylinder yang disusun secara horizontal opposed dengan sistem fuel injection yang mampu menghasilkan tenaga sebesar 180 horsepower. Selain itu, pesawat di desain secara high wing yang menawarkan visibilitas dan stabilitas yang lebih baik. pesawat seri ini yang dimana menunjukkan bahwa pesawat ini merupakan pesawat paling favorit di kelasnya serta memiliki sistem tricycle landing yang kokoh dan badan pesawat yang tangguh.

Pesawat Cessna seri 172 Skyhawk ini merupakan update dari model varian cessna 172 sebelumnya yang dimana seri ini pertama kali diproduksi pada tahun 1998. Pesawat Cessna 172 Skyhawk ini dibekali teknologi terbaru dalam sistem integrasi avionic cockpit, yaitu Garmin G1000 Nav III. Dengan antarmuka grafis yang meningkat, perangkat hardware yang powerfull, tampilan resolusi lebih tinggi, fungsionalitas tambahan untuk meningkatkan kesadaran situasional, dan teknologi nirkabel opsional, sehingga mempermudah pengguna dalam mengelola sistem flight instrument. Akan tetapi Pesawat Cessna seri 172 Skyhawk sendiri belum dilengkapi GFC 700 atau *system autopilot*, Adapun beberapa fitur yang ditawarkan pada sistem Garmin G1000 pada pesawat ini sebagai berikut :

1. *Wireless database and flight plan loading*
2. *Enhanced Vision System (EVS)*
3. *Enhanced HSI Functionality*
4. *VFR Sectionals*
5. *Chelton FlightLogic EFIS glass cockpits*
6. *COM Frequency Decoding*
7. *XGA technology display unit*

Selain membahas tentang Garmin G1000 Nav III. Berikut ini juga akan dipaparkan terkait spesifikasi lebih lengkap seperti : *Dimensions, performance, weights,* pada tabel 3.1, tabel 3.2, dan tabel 3.3 dari Cessna 172 Skyhawk milik Penerbang Indonesia Banyuwangi:



Gambar 3. 1 *Airplane* Dismension *sumber AMM 6-10-00 Cessna 172S Skyhawk*

Tabel 3. 1 *Dimensions Cessna 172S Skyhawk*

Dimensions	
Length	27 ft 2 in (8.3 m)
Height	8 ft 11 in (2.7 m)
Wingspan	36 ft 0 in (11.00 m)
Wing Area	174 sq ft (16.17 sq m)

Tabel 3. 2 *Performance Cessna 172S Skyhawk*

Performance	
Maximum Cruise speed	124 ktas (230 km/h)
Maximum Range	640 nm (1,185 km)
Takeoff Distance	1,630 ft (497 m)
Landing Distance	1,335 ft (407 m)
Maximum Climb Rate	730 fpm (223 mpm)
Maximum Limit Speed	163 kias (302 km/h)
Stall Speed	48 kcas (89 km/h)

Tabel 3. 3 *Weights Cessna 172S Skyhawk*

Weight	
Maximum Ramp Weight	2,558 lb (1,160 kg)
Maximum Takeoff Weight	2,550 lb (1,157 kg)
Maximum Landing Weight	2,550 lb (1,157 kg)
Maximum Payload	870 lb (395 kg)
Useful Load	878 lb (398 kg)

Pada Table 3.4 dijelaskan spesifikasi powerplant pesawat Cessna 172S Skyhawk bedasarkan referensi POH, pada pesawat tersebut dijelaskan bahwa pesawat Cessna 172S Skyhawk dengan model IO-360-L2A memiliki *fuel capacity* 56 *gallons* dengan *fuel tank* kiri 28 gallons dan *fuel tank* kanan 28 *gallons* serta *oil capacity* diperoleh 8 *quarts*.

Tabel 3. 4 *Powerplant* Cessna 172S Skyhawk

Powerplant

Manufacture	Lycoming
Model	IO-360-L2A
Power Output	180 hp
Propeller Manufacture	McCauley
Description	2 blade metal, Fixed pitch
Fuel Capacity	56 *gallons*
Oil Capacity	8 *quarts*

3.2 Piper Seneca V

Piper Seneca V merupakan pesawat piston *multi engine* yang dikenaln dengan ketangguhan dan keunggulan daripada pesawat piston *multi engine* lainnya. Pesawat ini merupakan pengembangan dari sebelumnya yaitu Seneca 2 yang Dimana pesawat menunjukkan peningkatan perfoma, jangkauan, dan sistem *avionic* yang lebih baru. Selain itu pesawat ini ditengai oleh mesin *Continental* 6 silinder yang tersusun secara horizontal *opposed* dengan sistem turbo charged dan *fuel injection* yang mampu menghasilkan 220 bhp. Selain itu, pesawat ini menggunakan *low wing* dan *retract landing gear* yang membuat pesawat lebih aerodinamis.

Pesawat ini juga dilengkapi dengan teknologi *avionic* terbaru yaitu Garmin G1000 Nav III. Dengan antar muka grafis meningkat, *hardware* yang lebih *powerful*, tampilan resolusi lebih tinggi, fungsionalitas tambahan untuk meningkatkan kesadaran yang bersifat opsional, dan dilengkapi dengan nirkabel sehingga mempermudah pengguna menggunakan sistem *flight instrument*.

Pada tabel 3.5 dan tabel 3.6 menjelasan spesifikasi Piper Seneca V tentang *Dimensions* serta *performance*. Sesuai dengan referensi POH diperoleh *rated horse power 220 HP, rated speed (rpm) 2600, fuel capacity 128 gallons, oil capacity* 8 *quarts* per *engine*.

Tabel 3. 5 *Dimensions* Piper Seneca V

Dimensions	
Length	28 ft 44 in (8.72 m)
Height	9 ft 10 in (3.02 m)
Wingspan	38 ft 10 in (11.8 m)
Wing area	208.7 sq ft (19.39 sq m)

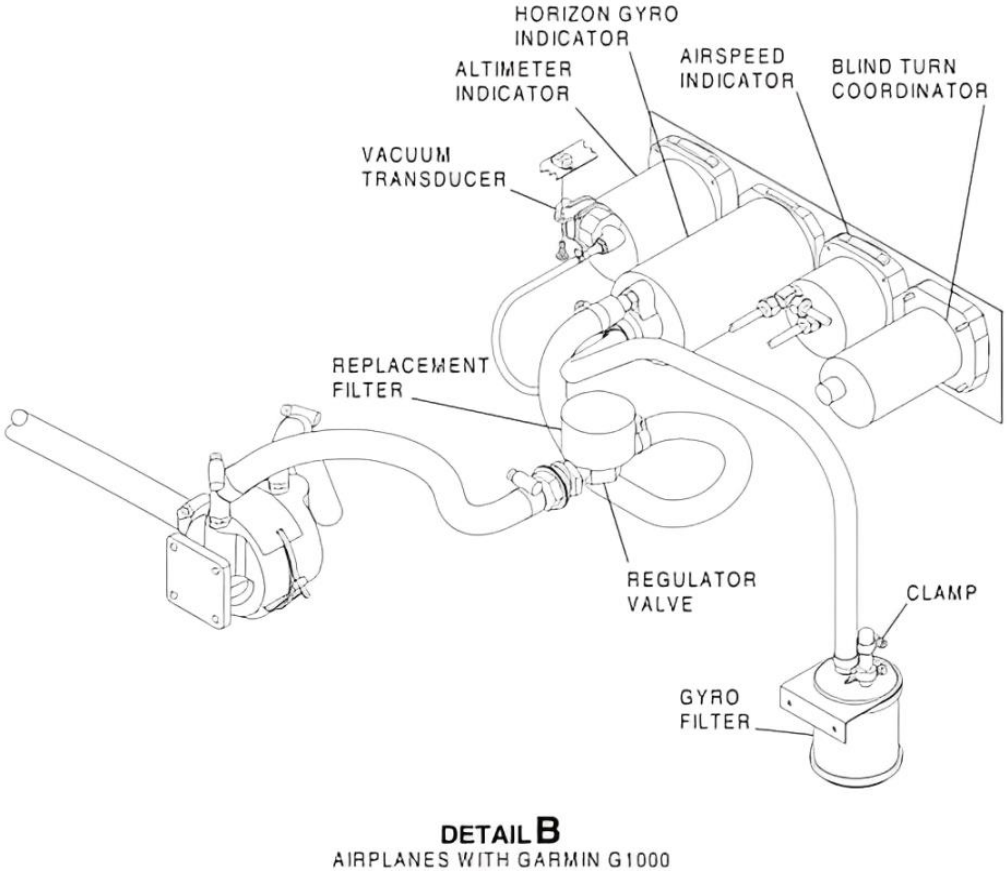
Tabel 3. 6 *Powerplant* Piper Seneca V

Powerplant	
Engine Manufacturer	*Continental Motor, Inc*
Engine Model Number Left	*TSIO-360RB*
Engine Model Number Right	*LTSIO-360RB*
Rated Horsepower	*220 HP*
Rated Speed (Rpm)	*2600*
Propeller Manufacturer	*McCauley*
Propeller Type	*Constan Speed,Full Feathering, Hydraucally Activated*
Fuel	*Avgas Only*
Fuel Capatity	*128 Gallons*
Oil Capacity	*8 Quarts per engine*

3.2 *Vacuum pump*

Vacuum pump adalah salah satu komponen pesawat yang terletak pada bagian belakang engine yang berfungsi untuk mengoperasikan *instrument gyro* dengan cara menyedot udara dari dalam kabin, instrument yang menggunakan gyro ada 3 yakni : *attitude indicator* atau *artificial horizon, Heading Indicator,* dan *turn and bank indicator.* Minimal tekanan *vacuum pump* menyedot udara agar instrument bekerja dengan baik adalah diantara 4.5 sampai 5.5 *inches Hg. vacuum pump* bekerja karna diputar oleh *engine* melalui *engine gear box.*

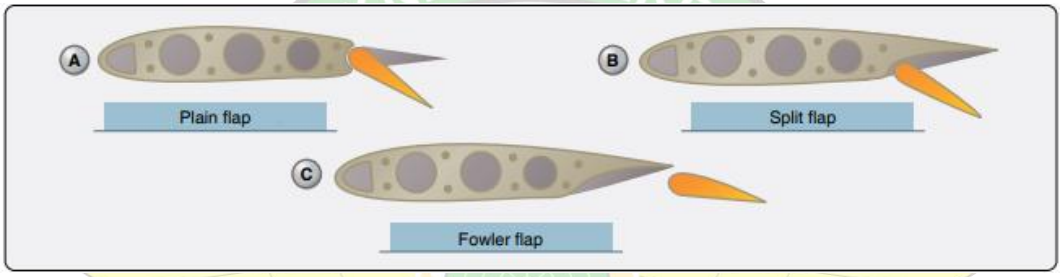
Gambar 3. 2 *Vacuum Pump*



Gambar 3. 3 Skematik vacuum pump (sumber AMM Cessna 172S Skyhawk)

3.3 *Flaps*

Flap adalah salah satu *flight control secondary* yang berfungsi untuk menambah gaya hambat dan gaya angkat, yang digunakan pada saat *take off* serta *slow flight* sebelum *landing*. *Flap* terletak di tepi belakang sayap (*trailing edge*) yang berdekatan dengan badan pesawat (*fuselage*). *Flaps* sendiri termasuk ke dalam ata chapter 27. *Flap* biasanya dibuat dari bahan dan dengan kontruksi yang digunakan pada airfoil dan permukaan kontrol pesawat tertentu, *Flap* pesawat berkinerja tinggi juga dapat terbuat dari aluminium, tetapi penggunaan struktur komposit juga umum digunakan . Ada berbagai macam jenis *flaps* diantaranya : *Plain flap, Split flap, fowler flap*. Pesawat latih seperti Cessna 172S Skyhawk menggunakan *flap* jenis *Plain Flap* (FAA 2023).



Gambar 3. 4 Jenis *plain flaps, split flap, fowler flap*
(sumber : FAA 2023)

3.4 *Magneto*

Prinsip dari *ignition*

Sebelum mempelajari magneto kita perlu memahami terlebih dahulu bagaimana prinsip *ignition*? Secara sederhana dari *main battery* memberikan arus listrik kepada *starter* guna untuk memutar *engine*, ketika *engine* telah berputar *engine gear box* memutar *gear* pada *magneto*.

Jadi pada saat *event* pertama dari 4 *stroke* yaitu *induction*, sebuah *piston* bergerak ke bawah untuk menerima *fuel* dan *air* ke dalam *cylinder* melalui *valve intake*. Ketika *compression event piston* bergerak ke atas *before* 25^0 *top dead center fuel air mixture* dibakar oleh *electric spark* melalui *spark plug*, itulah yang dinamakan *ignition event*. *Ignition system* memberikan *spark* secara berkala di setiap *cylinder* sesuai dengan *engine timing firing order*.

Ignition memiliki 2 sistem yaitu *battery ignition system* dan *magneto ignition.*

1. Pada *battery ignition system* baterai adalah sumber energi untuk menyalakan magnetonya.
2. *Magneto ignition* lebih modern daripada *battery ignition* karena dapat menghasilkan *spark* pada kecepatan mesin tinggi dan dia adalah *self-contained unit*, tidak bergantung pada sumber listrik manapun. Arus yang dihasilkan dari *magneto ignition* adalah arus *ac*.

Komponen Pada *Magneto*

Magneto memiliki 3 *circuit* yaitu : *Magnetic, Primary, secondary*. Mereka bekerja sama untuk menghasilkan *spark* pada *spark plug*. Pada *magnetic circuit* berisi : *permanent magnet, coil core, pole shoes dan pole shoes extension*. Pada *primary circuit* berisi *: primary coil, breaker point, dan condenser*. Pada *secondary circuit* berisi : *secondary coil, distributor, spark plug lead, spark plug.*

1. *Impulse Coupling*

Impulse coupling pada dasarnya digunakan untuk memutar *spring*, jadi pada saat *starting engine impulse coupling* berputar satu *shaft* dengan *flyweight*, *flyweight* saat berputar bersentuhan dengan *stop pin* menahan *spring*. Ketika tekanan *spring* sudah *limit* kemudian *flyweight* tersandung melepaskan *spring*, *spring* tersebut meningkatkan kecepatan putaran *rotor magneto* secara tiba-tiba sehingga *magneto* menghasilkan arus listrik. Setelah *engine running magneto* berputar dengan cepat *flyweight* terselip dan *impulse coupling*-nya tidak lagi digunakan.

2. *Magnet*

Didalam *rotor magneto* terdiri dari : *permanent magnet, coil, core. Permanent magnet* di dalam *magneto* terbuat dari *alnico: aluminium, iron, nikel, cobalt.* Lalu bagaimana *magnet* bisa menghasilkan arus listrik pada *coil*? Jadi ketika *permanen magnet* di dekatkan dengan *coil* akan terjadi medan *magnet*, pada medan *magnet* memiliki jalur garis atau yang disebut dengan *line of magnetic flux*. garis *flux* melewati putaran kawat pada *coil*. Ketika satu *garis flux* melewati satu putaran *coil* itu disebut *flux linkage*.

Apabila *permanent magnet* diputar akan ada perubahan *flux linkage* bergerak kearah *coil* atau istilah dalam bahasa Indonesia memotong garis medan magnet, perubahan *flux linkage* ini menginduksi tegangan pada *coil,* tegangan atau *EMF* (*electromotive force*) menyebabkan arus listrik mengalir dari *coil* pada *magnet* ke *primer coil*. Prinsip ini diterapkan pada *magneto* karena garis-garis *flux* harus melewati *coil* dan harus ada gerakan *coil* atau *magnet* untuk menghasilkan perubahan *flux linkage*. Selama proses tersebut juga terjadi hukum *lenz,* ketika perubahan *flux linkage* menghasilkan tegangan yang menetapkan arus pada *coil.*

Ujung dari *coil* tersebut terhubung dalam *magnet* ke *breaker point* serta terkoneksi pada *ignition switch lead*, ketika *breaker point* tertutup maka arus mengalir dari *coil* ke *ground* dan kembali dari *ground* ke *coil* dalam sirkuit lengkap.

3. *Breaker point*

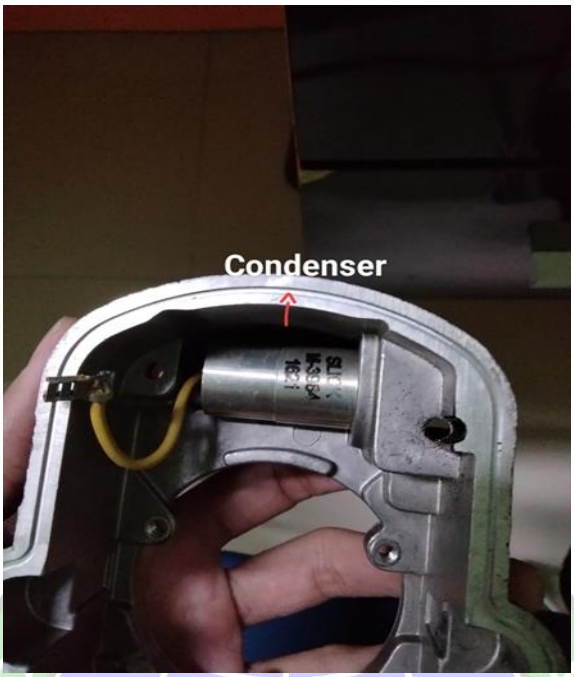
Breaker point digunakan untuk menghentikan arus pada *primer coil* secara tiba-tiba, *breaker point* digerakan oleh *cam* yang terhubung pada *gear system*. Pada saat *breaker point* terbuka terdapat *arc* atau arus yg melintas ke *point* tersebut sehingga dapat menyebabkan *burning* pada komponen di dalam *magneto* oleh karena itu dipasangkanlah kapasitor atau *condenser.*

4. *capasitor* / *condenser*

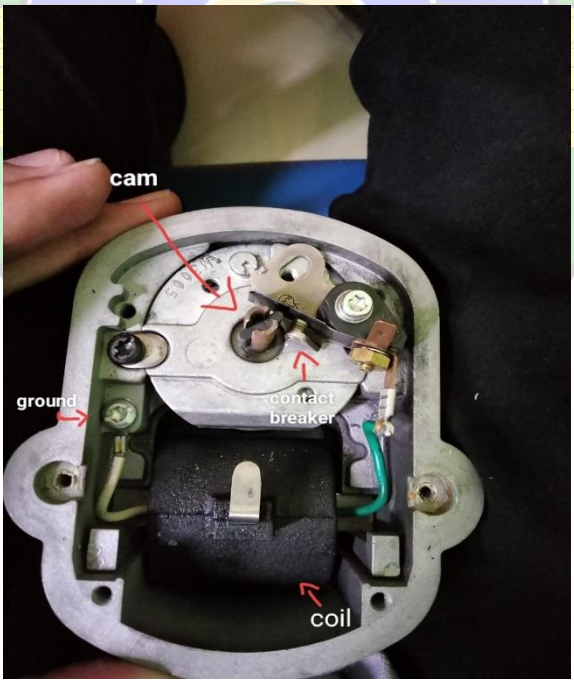
Condenser berfungsi sebagai tempat penyimpanan untuk menyerap kenaikan arus listrik secara tiba-tiba di dalam *coil primer* sehingga mencegah *arc* atau arus yang melintas pada saat *breaker point*, ketika *breaker point* terbuka maka tidak ada *arc* / arus lagi karena arus mengalir ke *condenser* serta berkat *condenser medan magnet* di *magnet coil* cepat sekali *collapse* (runtuh). Pada saat *breaker point* tertutup lagi, arus listrik yang berada di *condenser* mengalir lagi melalui *breaker point* sehingga menginduksi *voltage* pada *primer coil*, lonjakan *voltage* tersebut di salurkan dari *primer coil* menuju ke *secondary coil*.

5. *distributor*

arus listrik dari *secondary coil* menuju ke *high tension terminal* kemudian arus listrik menuju ke *high voltage electrode* setelah itu arus listrik menuju ke *harnest spark plug* dan yang terakhir arus listrik menujuk ke *spark plug*.



Gambar 3. 5 *condenser* pada *magneto*



Gambar 3. 6 komponen pada *magneto*

3.5 Garmin 1000

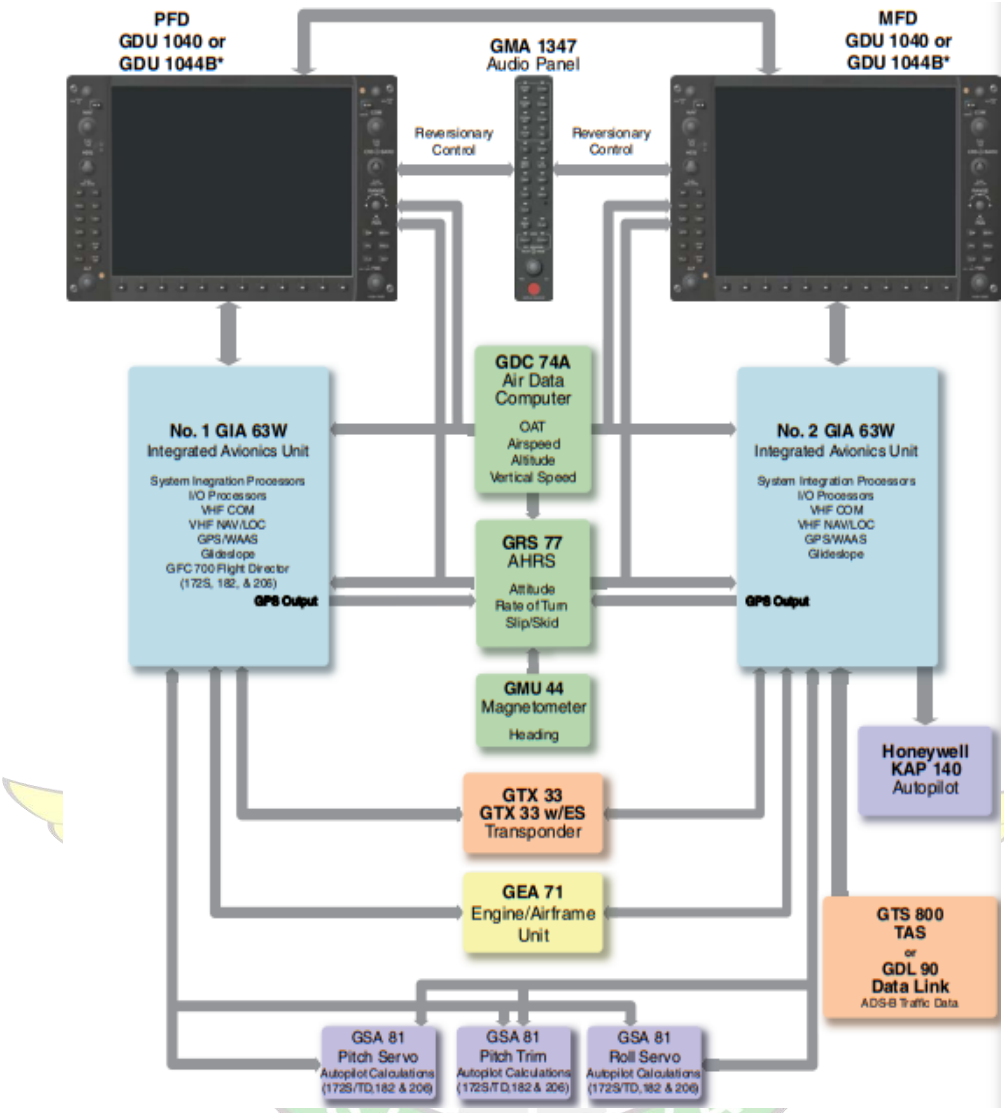
Garmin G1000 merupakan sebuah *integrated flight control system* pada pesawat Cessna yang disebut dengan *Electronic Flight Instrument System* atau umumnya dikenal dengan *glass cockpit*. Garmin G1000 dapat menyajikan berbagai macam informasi mengenai penerbangan seperti posisi, navigasi, komunikasi, dan informasi identifikasi kepada pilot melalui tampilan layar yang besar. Sistem ini terdiri dari Line Replaceable Units (LRU):

• GDU 1040 *Primary Flight Display* (PFD)
• GDU 1040 *Multi Function Display* (MFD)
• GDU (*Garmin Display Unit*)
• GIA (*Garmin Integrated Avionics*)
• GDC (*Garmin Data Computer*)
• GEA (*Garmin Engine Airframe*)
• GRS (*Garmin Reference System*)
• GMU (*Garmin Magnetometer Unit*)
• GMA (*Garmin Multifunction Audio*)
• GTX (*Garmin Transponder*)
• GDL (*Garmin Data Link*)

Pada gambar 3.7 menunjukan skematik sistem G1000 pada pesawat Cessna. Seluruh LRU memiliki *modular design* guna mempermudah *troubleshoot* serta perawatan pada sistem G1000.

3.5.1 *GEA* 71

GEA 71 adalah salah satu dari *LRU* yang berbasis mikroprosesor yang berfungsi untuk menerima dan memproses sinyal dari sensor *engine* dan *airframe*. *GEA* 71 berkomunikasi langsung dengan kedua *GIA* menggunakan RS-485 *digital.interface*, salah satu contoh sensor *engine* yang menggunakan *GEA* 71 adalah *CHT* (*cylinder heat temperature*) dan *EGT* (*exhaust gas temperature*) keduanya menggunakan modul *temperature* sensor dan *thermocouple*. Pengaturan perangkat lunak dan konfigurasi diterima melalui *digital interface* RS-232 dengan *GIA*, berikut bentuk komponen GEA 71 pada gambar 3.8.

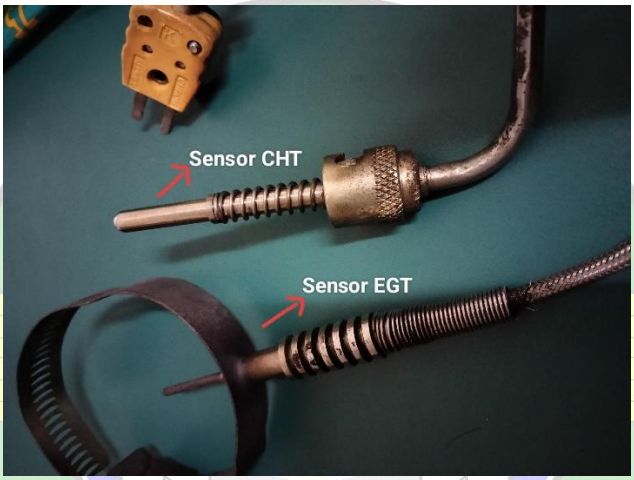


Gambar 3. 7 Skematik G1000 (surmber garmin1000)

Gambar 3. 8 GEA 71 (sumber : Garmin1000 Nav III LMM)

3.6 *CHT* Dan *EGT*

CHT dan *EGT* berfungsi untuk mengukur *temperature* pada *intake* dan *exhaust* pada *cylinder*, temperatur gas diukur dengan menggunakan *thermocouple* yang dipasang di *intake* dan *exhaust* dan disajikan pada pengukur dek penerbangan dalam derajat *Fahrenheit* atau derajat *Celcius*. Setiap *cylinde*r memiliki *thermocouple* untuk mengetahui perbedaan *temperature* di setiap *cylinder*, data *temperature* yang diperoleh tersebut kemudian diterima dan diproses oleh *GEA* 71 lalu di kirim melalui *GIA* 63 sebagai penghubung semua LRU setelah itu data tersebut dikirim ke *GDU* sebagai monitor *display*.



Gambar 3. 9 Sensor *CHT* dan *EGT*

3.7 *Maintenance* Pada Pesawat Cessna 172S Skyhawk

Keselamatan pesawat terbang dimulai di ground oleh karena itu *maintenance* pada pesawat merupakan salah satu unsur penting dalam suatu perusahaan di bidang penerbangan sebagaimana Akademi Penerbang Indonesia Banyuwangi. Berdasarkan *Civil Aviation Safety Regulation* (*CASR*) *part* 43 *tentang Maintenance, Preventive Maintenance, Rebuilding and Alteration*. Maintenance adalah proses memastikan bahwa sebuah pesawat aman dan layak untuk terbang, melalui inspeksi rutin, perbaikan, dan penggantian komponen. Hal ini dikarenakan setiap part atau komponen pesawat memiliki *lifetime* tertentu, sehingga harus dimonitor secara rutin contoh seperti *replace oil filter* setiap 50 jam sekali sesuai *aircraft maintenance manual*. *Maintenance* dilakukan oleh seorang engineer yang memiliki *AMEL* (*Aircraft Maintenance Engineer License*) sesuai dengan peraturan

keselamatan penerbangan sipil *part 65* yaitu *Licensing of Aircraft Maintenance Engineer*

Gambar 3. 10 *Maintenance main wheel* pesawat Cessna 172S Skyhawk

3.8 Persyaratan *Inspection*

Inspeksi dilakukan sebagaimana diatur dalam *part* 135 atau 91 *section* 91.409(e), dilakukan inspeksi sesuai dengan petunjuk dan prosedur yang ditetapkan dalam program inspeksi untuk pesawat yang sedang diinspeksi. Setiap orang yang melakukan inspeksi tahunan atau *100 hours inspection* harus menggunakan *checklist* saat melakukan inspeksi.

2. Inspection Requirements

A. As required by U.S. Federal Aviation Regulations, all civil aircraft of U.S. registry must undergo a complete inspection (annual) each twelve calendar months. In addition to the required annual inspection, aircraft operated commercially (for hire) must have a complete inspection every 100 hours of operation.

B. Compliance with the regulations is accomplished using one of three methods:

(1) **Traditional (Annual/100 Hour) inspection program** which utilizes 14 CFR 43, Appendix D (scope and detail) to inspect the airplane. In addition, Cessna recommends certain components or items be inspected at 50 hour intervals. These inspection items are listed in Inspection Time Intervals, Section 5-10-01.

(2) **Progressive Care inspection program** which allows the work load to be divided into smaller operations that can be accomplished in a shorter time period. This method is detailed in Progressive Care Program, Section 5-12-00. If the Progressive Care inspection program will be used in lieu of the Traditional (Annual/100 Hour) inspection program, the local FAA FSDO must approve the program before it is adopted in accordance with 14 CFR 91. 409(d). International operators must gain approval from their local airworthiness authority to utilize the Progressive Care inspection program.

(3) **PhaseCard inspection program** which is geared toward high-utilization flight operations (approximately 600 or more flight hours per year). This system utilizes 50-hour intervals (Phase 1 and Phase 2) to inspect high-usage systems and components. At 12 months or 600 flight hours, whichever occurs first, the airplane undergoes a complete (Phase 3) inspection.

NOTE: The existing PhaseCard inspection programs can continue to be used. However, Textron Aviation will no longer revise or update the program.

Gambar 3. 11 *Inspection Requirements* (sumber AMM 5-00-00 Cessna 172S Skyhawk)

a. Traditional (*Annual/100 hour*) *Inspection* Program yang merekomendasikan item komponen tertentu diperiksa dengan interval 50 jam. Item inspeksi ini tercantum dalam *Inspection Time Intervals*.
b. *Progressive Care Inspection* Program yang memungkinkan beban kerja dibagi menjadi lebih kecil operasi yang dapat diselesaikan dalam waktu yang lebih singkat. Metode ini dirinci dalam Program Perawatan Progresif, Jika program pemeriksaan Perawatan Progresif akan digunakan sebagai pengganti program inspeksi Tradisional (Tahunan/100 Jam), Internasional operator harus mendapatkan persetujuan dari otoritas kelaikan udara setempat untuk menggunakan *Progressive Care Inspection* Program.
c. *PhaseCard Inspection* Program yang diarahkan untuk operasi penerbangan dengan pemanfaatan jam terbang tinggi (sekitar 600 jam terbang atau lebih per tahun). Sistem ini menggunakan interval 50 jam (Fase 1 dan Fase 2) untuk memeriksa sistem dan komponen yang sering digunakan. Pada 12 bulan atau 600 jam terbang, mana yang terjadi lebih dulu.

Selama kegiatan *OJT* perawatan pesawat yang dilaksanakan menggunakan Traditional *Inspection* Program yaitu sebagai berikut :

1. *50 hours Inspection*
2. *100 hours Inspection*
3. *Pre-flight Check*
4. *engine ground run*

3.8.1 50 *Hours Inspection*

Kegiatan perawatan setiap pesawat mencapai penggunaan 50 jam terbang disebut dengan *50 hours inspection* menunjukan kegiatan-kegitan yang harus dilakukan. Dalam giatnya perawatan pesawat ini sesuai dengan referensi dari AMM (*Aircraft Maintenance Manual*) Cessna 172S. Sebagai contoh dilakukan inspeksi 50 jam pada tanggal 04-april-2024 oleh pesawat Cessna 172S Skyhawk PK-APK ditunjukan pada lampiran 1.

3.8.2 100 *Hours Inspection*

Kegiatan perawatan pesawat setiap pesawat mencapai penggunaan 100 jam disebut dengan 100 hours inspection. Dalam giatnya perawatan pesawat ini didasari dengan referensi dari AMM (*Aircraft Maintenance Manual*) Cessna 172S dan dilakukan oleh engineer yang memiliki AMEL. Seperti contoh pekerjaan 100 hours inspection pada pesawat PK-BYL tanggal 7 mei 2024 pada tanggal ditunjukan pada lampiran 2.

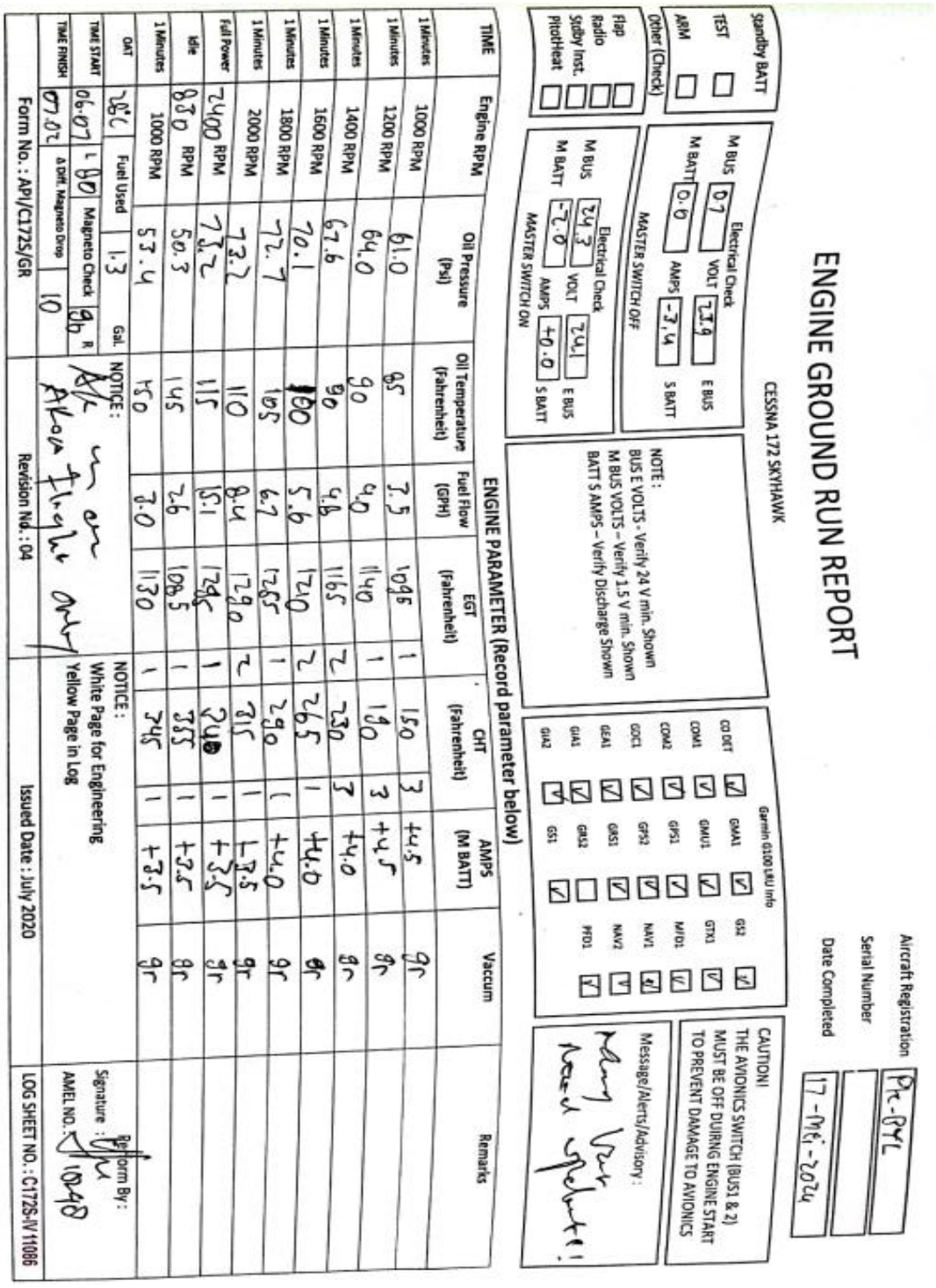
3.8.3 *Pre-Flight Check*

Pre-Flight merupakan kegiatan pemeriksaan pesawat sebelum dilakukan *ground run*, kegiatan ini guna untuk memastikan kondisi pesawat siap untuk terbang. Dalam pelaksanaannya kegiatan ini dilakukan oleh *engineer* serta di *double check* oleh taruna penerbang yang akan melaksanakan latihan terbang sesuai dengan referensi *Pilot Handbook*. Kegiatan ini dilakukan dengan melakukan *walk around* seperti gambar 3. 11 prosedur pre-flight check ditunjukan pada lampiran 3.

Gambar 3. 12 Dokumentasi *Pre-flight Check* PK-BYM

3.9 *Engine Ground Run*

Engine ground run dilakukan setelah engineer melakukan *pre-flight check* guna untuk memastikan *engine* dalam keadaan baik dan pesawat layak untuk terbang, *engine ground run* juga mengecek kedua *magneto* pada 1800 rpm guna mengetahui *drop magneto* dan *different magneto*.



ENGINE GROUND RUN REPORT

Aircraft Registration: PK-BYL
Serial Number:
Date Completed: 17-Mei-2024

CESSNA 172 SKYHAWK

Standby BATT — TEST ☐ — ARM ☐
Other (Check): Flap ☐ Radio ☐ Stdby Inst. ☐ PitotHeat ☐

Electrical Check — M BUS 0.7 — M BATT 0.0 — VOLT 13.9 — AMPS -3.4 — E BUS — S BATT
MASTER SWITCH OFF

Electrical Check — M BUS 24.3 — M BATT -2.0 — VOLT 24.1 — AMPS +0.0 — E BUS — S BATT
MASTER SWITCH ON

NOTE :
BUS E VOLTS - Verify 24 V min. Shown
M BUS VOLTS – Verify 1.5 V min. Shown
BATT S AMPS – Verify Discharge Shown

Garmin G100 LRU Info

CO DET ☑	GMA1 ☑	GIA1 ☑	GS2 ☑
COM1 ☑	GMU1 ☑	GIA2 ☑	GTX1 ☑
COM2 ☑	GPS1 ☑	GDC1 ☑	MFD1 ☑
GDC1 ☑	GPS2 ☑	GEA1 ☑	NAV1 ☑
GEA1 ☑	GRS1 ☑	GIA1 ☑	NAV2 ☑
GIA1 ☑	GRS2 ☐	GIA2 ☑	PFD1 ☒
GIA2 ☑	GS1 ☑		

CAUTION!
THE AVIONICS SWITCH (BUS1 & 2) MUST BE OFF DUIRNG ENGINE START TO PREVENT DAMAGE TO AVIONICS

Message/Alerts/Advisory :
Normal

ENGINE PARAMETER (Record parameter below)

TIME	Engine RPM	Oil Pressure (Psi)	Oil Temperature (Fahrenheit)	Fuel Flow (GPH)	EGT (Fahrenheit)		CHT (Fahrenheit)		AMPS (M BATT)	Vaccum	Remarks
1 Minutes	1000 RPM	61.0	85	7.5	1095	1	150	3	+4.5	9r	
1 Minutes	1200 RPM	64.0	90	9.0	1140	1	180	3	+4.5	9r	
1 Minutes	1400 RPM	67.6	90	9.8	1165	2	230	3	+4.0	9r	
1 Minutes	1600 RPM	70.1	100	5.6	1240	2	265	1	+4.0	9r	
1 Minutes	1800 RPM	72.7	105	6.7	1285	1	290	1	+4.0	9r	
1 Minutes	2000 RPM	73.2	110	8.4	1290	2	315	1	+3.5	9r	
Full Power	2400 RPM	73.2	115	15.1	1295	1	340	1	+3.5	9r	
Idle	830 RPM	50.3	145	2.6	1085	1	335	1	+3.5	8r	
1 Minutes	1000 RPM	53.4	150	3.0	1130	1	345	1	+3.5	9r	

OAT: 28°C — Fuel Used: 1.3 Gal. — TIME START: 06.07 — L 90 R — Magneto Check: 90 — TIME FINISH: 07.02 — Δ Diff. Magneto Drop: 10

NOTICE : Akan terbang ulang

NOTICE :
White Page for Engineering
Yellow Page in Log

Perform By :
Signature :
AMEL NO. 10948

Form No. : API/C172S/GR — Revision No. : 04 — Issued Date : July 2020 — LOG SHEET NO. : C172S-IV 11086

Gambar 3. 13 Contoh *engine ground run* PK_BYL

3.10 Fuel System

Fuel System adalah komponen yang berfungsi untuk mendistribusikan *fuel* dari *fuel tank* ke dalam masing – masing cylinder melalui *injection servo* sesuai dengan jumlah yang dibutuhkan dan waktu yang tepat agar *engine* dapat bekerja dengan baik dan dapat menghasilkan performa yang diinginkan. secara garis besar berikut komponen *aircraft fuel system* beserta fungsinya terdiri dari :

1. *Fuel Tank*

   Sesuai Namanya *fuel tank* berfungsi sebagai wadah *fuel* yang terletak di bagian kedua *wing* dekat dengan *flap*. Didalam *fuel tank* terdapat *screen, fuel quantity indicator, vent* dan *drain*. *Indicator fuel quantity* berfungsi untuk mengukur jumlah *fuel* pada *fuel tank*, pada pesawat Cessna 172S menggunakan *can bus type* sebagai *fuel quatity indicator*. *Screen* di dalam *fuel tank* berfungsi untuk menyaring *FOD*. *vent* berfungsi untuk masuknya udara agar *fuel tank* tidak kempot pada saat *fuel* menuju ke *engine*. *Drain* digunakan pada saat *preflight* yang berfungsi untuk memeriksa dan memastikan *fuel* tidak tercampur dengan air.
2. *Fuel selector*

   Fuel selector digunakan untuk pilot untuk memilih penggunakan pada kedua *fuel tank*. Pada *fuel selector* pilot bisa memilih *left*, *both*, dan *right*. Didalam *fuel selector* juga terdapat drain.
3. *Fuel Reservoir Tank*

   Komponen tersebut berfungsi sebagai wadah *fuel* setelah *fuel* melewati *fuel selector*. Selain itu *fuel reservoir tank* juga berfungsi sebagai wadah *return* dari *fuel control unit*.
4. *Auxiliary Pump*

   Auxiliary pump menggunakan *electrical* yang berfungi untuk *priming* pada saat menjelang *engine ground run test* serta digunakan pada saat *emergency* ketika *go around*.
5. *Fuel Shutoff Valve*

   Komponen tersebut berfungsi seperti kran air yang membuka dan menutup aliran *fuel*.

6. *Fuel Strainer*

   Fuel trainer berfungsi sebagai penyaring atau *filter*, komponen tersebut juga memiliki *drain* yang berfungsi memastikan *fuel* tidak terkontaminasi dengan air. Perbedaan dari *fuel trainer* dengan *screen* pada *fuel tank* adalah diameter, diameter *screen* lebih besar dari pada *fuel stainer*.

7. *Engine Driven Fuel Pump*

   Komponen tersebut berfungsi untuk memompa *fuel* dari *fuel trainer* menuju *fuel distribution valve* atau *manifold*, *engine driven fuel pump* digerakan oleh *engine*.

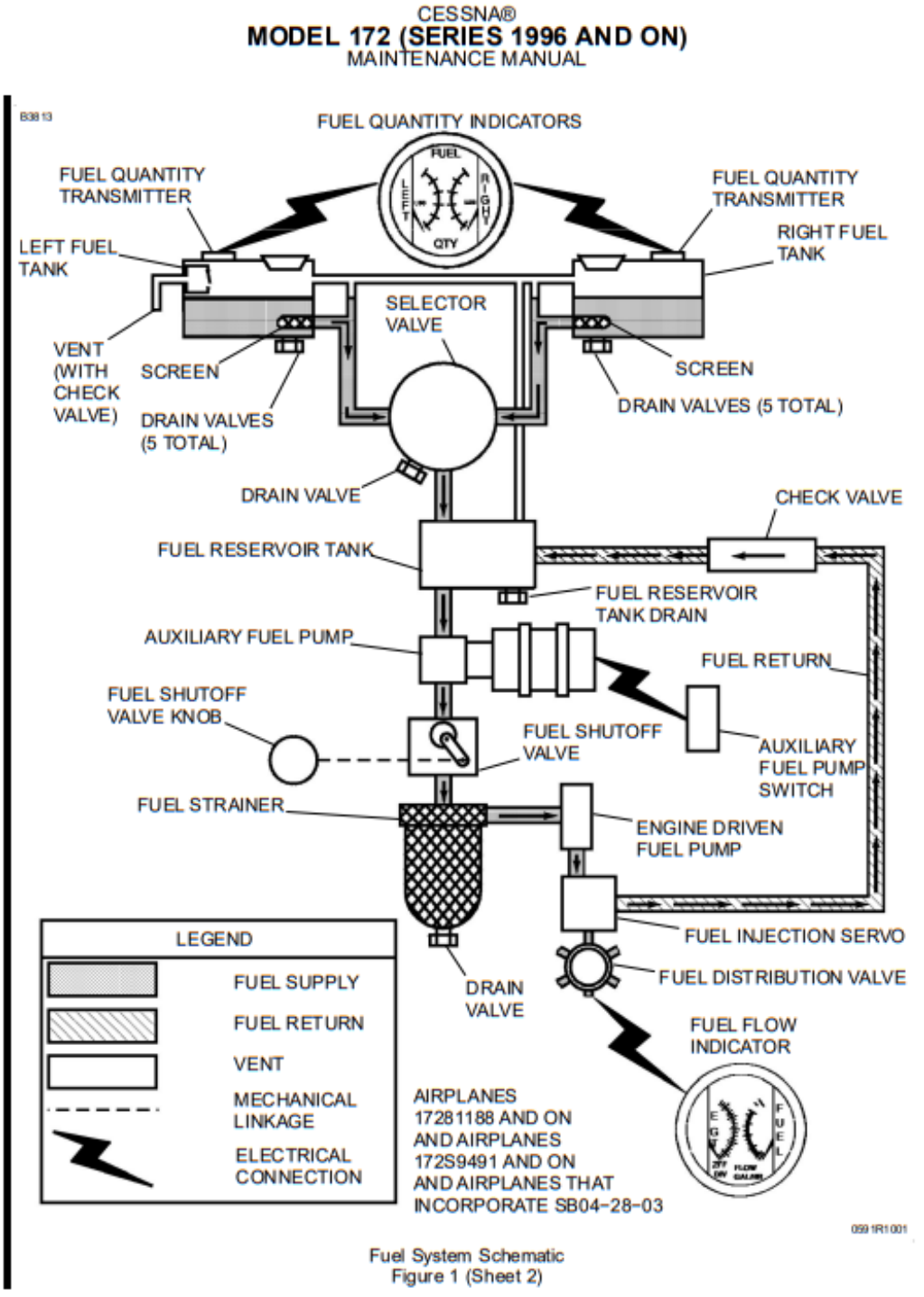
8. *Fuel Injection Servo*

   Fuel Injection Servo atau nama lainnya *fuel control unit* guna untuk mengatur komposisi *fuel* menuju *cylinder*. Contoh apabila engine membutuhkan 25 *fuel* sedangkan *output engine driven pump* 125 maka yang ada di *fuel injection servo* ada 100 *fuel* lalu dibagi ke 4 *cylinder*, sisanya dari *engine driven pump return* ke *reservoir*.

9. *Fuel distribution valve*

   Setelah aliran *fuel* melewati *fuel injection servo* kemudian aliran *fuel* menuju ke *fuel distribution valve* yang berfungsi untuk penghubung aliran *fuel* ke *cylinder*. Didalam *fuel distribution valve* terdapat *sensor fuel flow indicator* yang berfungsi untuk mengetahui jumlah aliran *fuel* menuju ke *cylinder*. Penjelasan fungsi semua komponen tersebut sesuai dengan gambar 3. 14 tentang *fuel system schematic*.

Cessna 172-S memiliki tipe *engine Lycoming* 10-360-L2A, yang mensyaratkan bahwa jenis *fuel* yang diperbolehkan untuk digunakan adalah AVGAS 100LL (berwarna biru) / AVGAS 100 (berwarna hijau).



Fuel System Schematic
Figure 1 (Sheet 2)

Gambar 3. 14 *Fuel System Schematic*

sumber: *AMM 28-20-00 page 3*

3.11 *Oil System*

Berikut sesuai dengan referensi *aircraft powerplant ninth edition chapter 4 lubricating system* fungsi lubrication pada pesawat *piston engine* diantaranya:

1. Guna untuk melumasi, dan mengurangi *friction* antara komponen yang bersentuhan secara langsung.
2. Sebagai pendingin komponen pada engine.
3. Sebagai *seal combustion chamber* pada *cylinder* dengan mengisi ruang antara dinding *cylinder* dengan *ring piston*, sehingga mencegah gas hasil pembakaran melewati *ring piston*.
4. Untuk membersihkan *engine* dengan membawa residu yang akan tersaring pada *oil filter*.
5. Mencegah *corrosion* dengan melindungi logam dari air dan oksigen.

Berikut penjelasan singkat fungsi dari komponen *lubrication system*:

1. *Oil sump*

   Oil sump berfungsi sebagai wadah *oil*, didalam *oil sump* terdapat *screen* yang berfungsi sebagai penyaring *FOD* pada *oil*.
2. *Oil pump*

   Oil pump berfungsi untuk memompa *oil* dari *oil sump* menuju ke *oil cooler bypass valve* atau *thermostat*. *Oil pump* digerakan oleh *engine* dengan *output pressure* 325 *psi*.
3. *Oil cooler bypass valve* atau *thermostat*

   Komponen tersebut berfungsi apabila *temperature* pada *oil* sangat tinggi sehingga *thermostat* menutup dan mengarahkan *oil* menuju ke *oil cooler*.
4. *Oil cooler*

   Oil cooler berfungsi sebagai pendingin *oil*.
5. *Pressure screen*

   Setelah *oil* melewati *oil cooler* kemudian *oil* melewati *pressure screen* atau *oil filter* yang berfungsi sebagai penyaring *FOD* pada *oil*.

6. *Oil relief valve*

   Setelah *Oil* melewati *pressure screen* kemudian *oil* melewati *relief valve* yang berfungsi sebagai pengatur *pressure oil* yang dihasilkan oleh *oil pump* sebelum *oil* menuju ke *engine* seperti pada gambar 3. 15 *oil system schematic*.

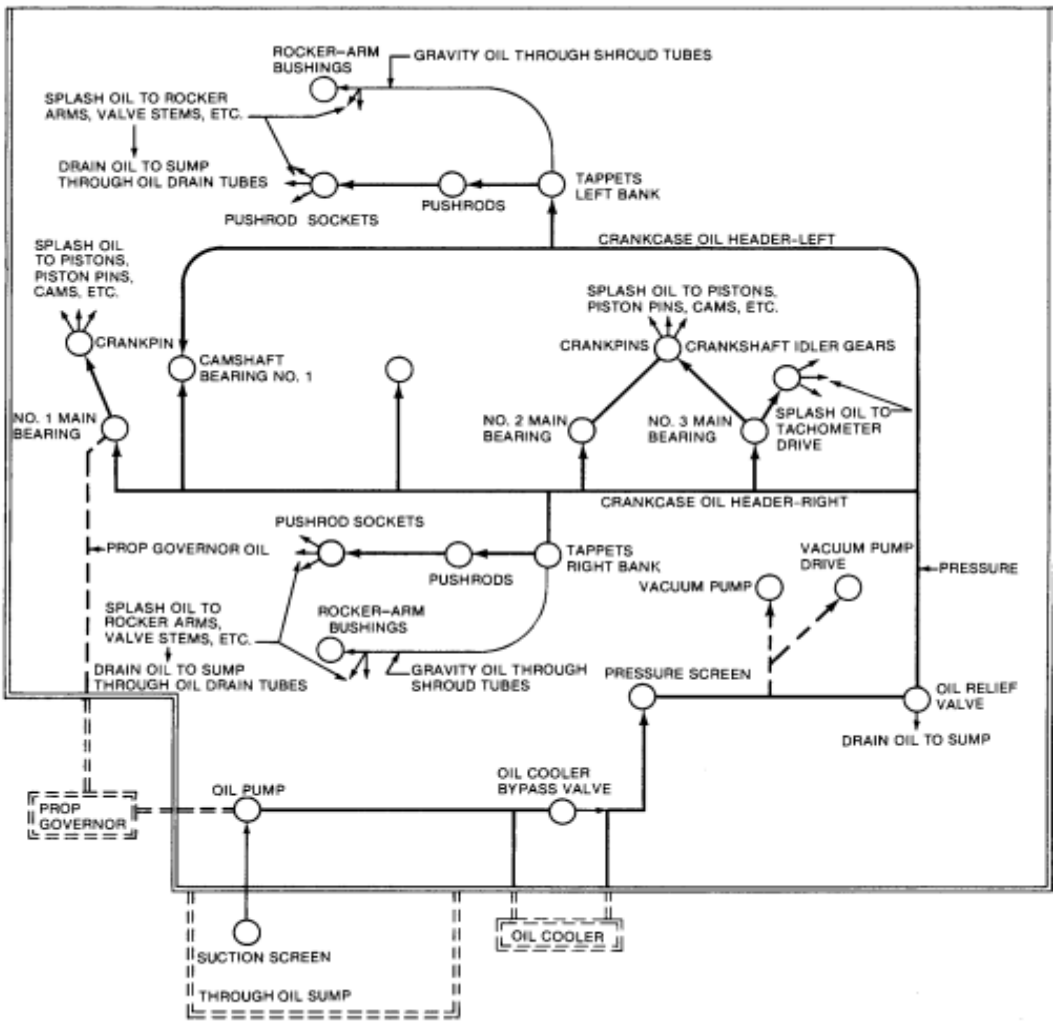


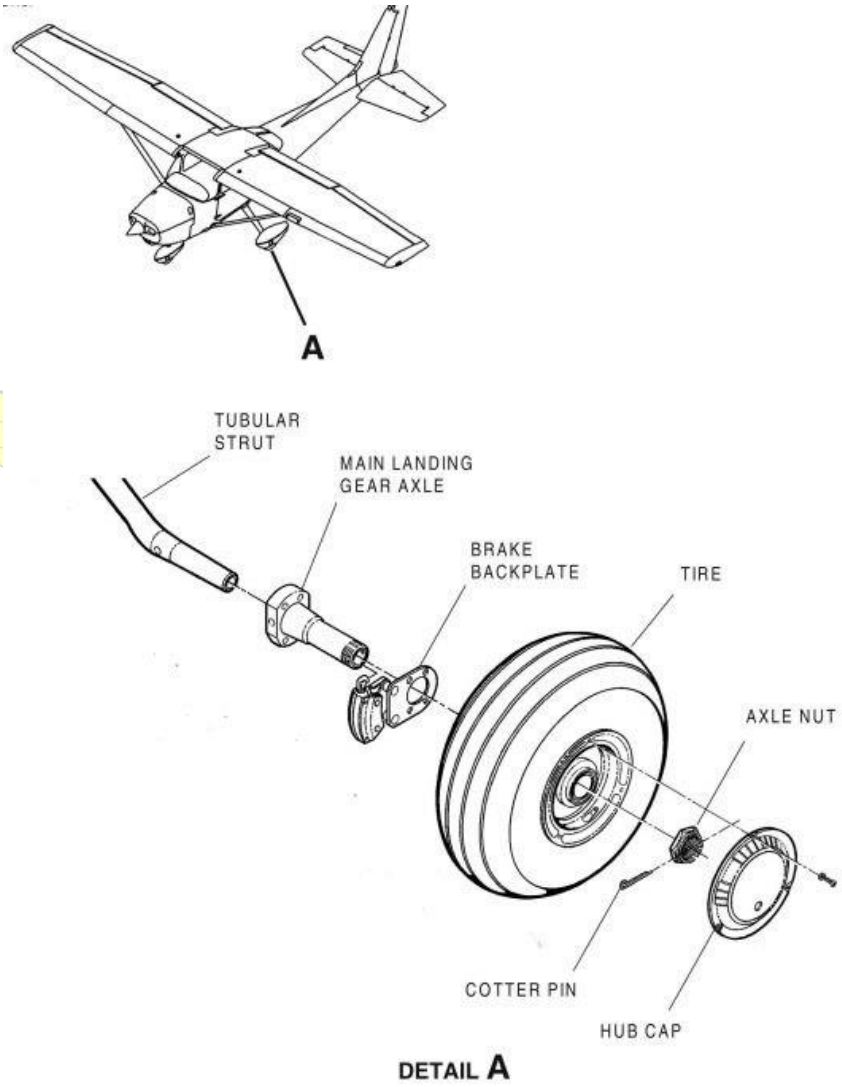
FIGURE 4-7 Lubrication for four-cylinder engines.

Gambar 3. 15 *Oil system schematic*

Sumber: *aircraft powerplant ninth edition chapter* 4

3.12 *Main Wheel Gear*

Main wheel gear adalah salah satu komponen pesawat yang berfungsi agar pesawat bisa bergerak di *ground*. Setiap *main wheel* dilengkapi dengan *brake* seperti pada gambar 3. 16 yang dioperasikan secara hidrolik dengan cara menginjak pedal yang terletak di *pedestal*. Selain itu *main wheel* juga dilengkapi dengan *parking brake lever* yang dioperasikan secara manual yang terletak di bawah *yoke* digunakan pada saat *engine ground run*.



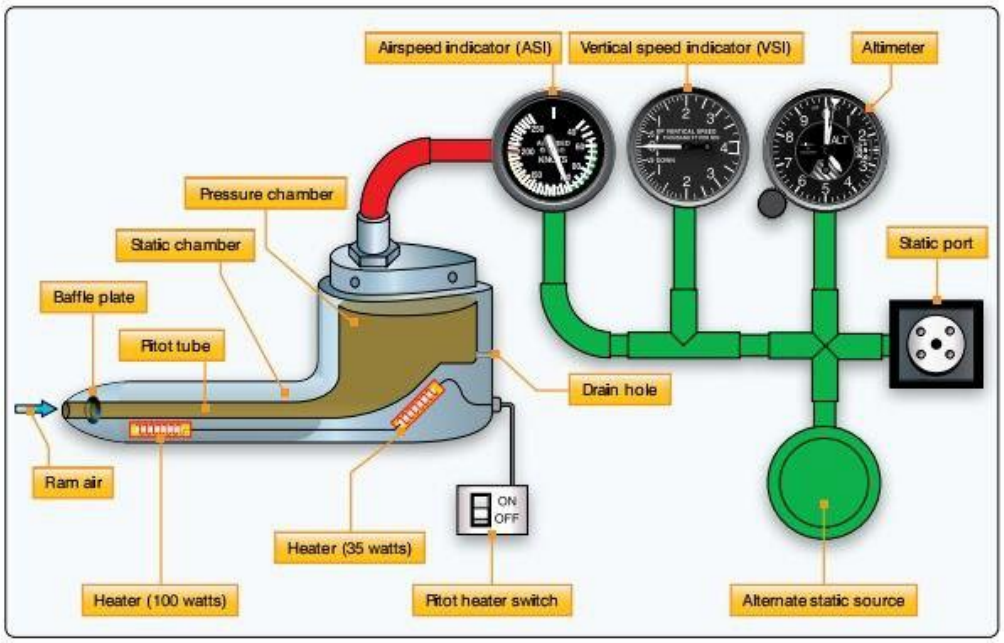
Gambar 3. 16 komponen dari *main wheel*

Sumber *AMM 32-40-00 page 202*

Wheel pada pesawat Cessna 172S Skyhawk sesuai dengan standard AMM harus bertekanan 42 psi guna untuk menopang berat dari pesawat, sesuai dengan AMM ata chapter 5 tentang *maintenance limit*, *main wheel* diinspeksi setiap 50 *hours*, akan tetapi setiap hari *engineer* menginspeksi pada saat *preflight* sesuai prosedur.

3.13 *Pitot System*

Pitot static adalah salah satu komponen yang ada pada pesawat terbang baik yang memiliki ukuran kecil maupun besar. *Pitot static system* berhubungan pada tiga *instrument* yaitu, *airspeed indicator*, *altimeter*, *vertical speed indicator*. *Airspeed indicator* berhubungan dengan *pitot pressure system* sedangkan *altimeter* berhubungan dengan *static pressure system.*



Gambar 3. 17 *Pitot-static system*

Pitot tube memiliki lubang yanga arah lubangnya tegak lurus dengan arah aliran udara, hal ini berfungsi untuk menerima *full force* dari *impact air pressure* saat pesawat melaju diudara. Pada *pitot tube* juga memiliki heater yang digunakan untuk mencegah terjadinya es pada area *pitot tube* yang dapat menutupi lubang pada *pitot tube*.

BAB IV
PELAKSANAAN *OJT*

4.1 Lingkup Pelaksanaan *OJT*

Pelaksanaan *OJT* dilaksanakan di API Banyuwangi khususnya di hanggar C serta menyesuaikan dengan kegiatan selama OJT sebagai berikut :

4.2 Waktu dan Tempat

On the Job Training (*OJT*) di Akademi Penerbang Indonesia Banyuwangi dilaksanakan dengan data sebagai berikut :

Peserta : Taruna D-III TPU 7B Politeknik Penerbangan Surabaya

Jumlah : 14 orang

Waktu : 1 April s/d 30 Juni 2024

Tempat : Hanggar A dan C Akademi Penerbang Indonesia Banyuwangi

4.3 Jadwal Kegiatan

Pelaksanaan *On The Job Training* (*OJT*) bagi taruna program studi D3 Teknik Pesawat Udara angkatan 7B yang berjumlah 14 orang secara intensif dimulai sejak tanggal 1 april 2024 sampai dengan 30 juni 2024 di Hanggar C Akademi Penerbang Indonesia Banyuwangi.

Pada table 4.1 jadwal kegiatan selama pelaksanaan *On The Job Training*. Dikarenakan jumlah peserta *On The Job Training* (OJT) 14 orang, maka dibagi menjadi 2 grup yaitu Grup A dibawah bimbingan mas Yogi, dan Grup B dibawah bimbingan mas Bagas dimana masing-masing grup terdiri dari 7 orang. Adapun waktu pelaksanaannya dibagi menjadi shift pagi mulai pukul 05.30-14.00 WIB dan shift siang mulai pukul 08.00 - 16.00 WIB yang dilaksanakan setiap hari Senin-Jumat, apabila ada terbang malam atau night flight maka shift siang masuk pada jam 11.00 - 19.00 WIB dan untuk hari sabtu menyesuaikan jika ada jadwal terbang maka pelaksanaannya hanya shift pagi jam 05.30-14.00 WIB, untuk hari minggu libur

Tabel 4. 1 Rekap Data Kegiatan OJT Bulan April 2024

Tanggal	Shift	Kegiatan
1-april-2024	Pagi	Pengenalan Tempat OJT
2-april-2024	Pagi	*Curve*
3-april-2024	Pagi	1. PK-BYM *Service Flaps Fail To Retract* 2. PK-APB, *Inspection* 50 *Hours*
4-april-2024	Pagi	1. PK-BYD *Replace Fuel Shutoff Valve Control Cable* 2. PK-APK, *Inspection* 50 *Hours*
5-april-2024	Pagi	1. PK-APE, *Inspection* 50 *Hours*
6-april-2024	Libur	Libur Idul Fitri
7-april-2024	Libur	Libur Idul Fitri
8-april-2024	Libur	Libur Idul Fitri
9-april-2024	Libur	Libur Idul Fitri
10-april-2024	Libur	Libur Idul Fitri
11-april-2024	Libur	Libur Idul Fitri
12-april-2024	Libur	Libur Idul Fitri
13-april-2024	Libur	Libur Idul Fitri
14-april-2024	Libur	Libur Idul Fitri
15-april-2024	Libur	Libur Idul Fitri
16-april-2024	Siang	*Curve*
17-april-2024	Siang	*Curve*
18-april-2024	Siang	*Curve*
19-april-2024	Siang	*Curve*
20-april-2024	Libur	*Weekend*
21-april-2024	Libur	*Weekend*
22-april-2024	Siang	1. PK-APE *Refueling*
23-april-2024	Siang	1. PK-ARY - *Replace Rockerbox Gasket Due To Oil Leak* - *Inspection* 100 *Hours*
24-april-2024	Siang	1. PK-ARX *Inspection* 100 *Hours* 2. PK-APF *Replace Magneto*
25-april-2024	Siang	
26-april-2024	Siang	1. PK-BYC *Fill and Bleed System Due To Lack Of Fluid In Master Cylinder Brake System*
27-april-2024	Libur	*Weekend*
28-april-2024	Libur	*Weekend*
29-april-2024	Pagi	1. PK-BYM *Preflight* dan *Engine Ground Run*
30-april-2024	Pagi	2. PK-APD *Inspection* 100 *Hours*

Tabel 4. 2 Rekap Data Kegiatan OJT Bulan Mei 2024

Tanggal	Shift	Kegiatan
1-Mei -2024	Libur	Hari Buruh
2-Mei -2024	Pagi	1. PK-APB *Preflight* dan E*ngine Ground Run*
3-Mei -2024	Pagi	1. PK-APP *Inspection* 100 *Hours*
4-Mei -2024	Libur	*Weekend*
5-Mei -2024	Libur	*Weekend*
6-Mei -2024	Siang	1. Pk-BYD Refueling, Refill Oil
7-Mei -2024	Siang	1. PK-BYS *Inspection* 100 H*ours*
8-Mei -2024	Siang	1. PK-BYL *Replace Plenum Cap* dan *Replace Horizon Gyro* 2. PK-BYJ *Replace Vacuum Pump*
9-Mei-2024	Libur	Libur Kenaikan Isa Al masih
10-Mei-2024	Libur	Libur Kenaikan Isa Al masih
11-Mei-2024	Libur	*Weekend*
12-Mei-2024	Libur	*Weekend*
13-Mei-2024	Pagi	1. PK-BYL *Pitot tube servicing* 2. PK-APA *Replace antenna*
14-Mei-2024	Pagi	Sakit
15-Mei-2024	Pagi	1. PK-APF *Replace main wheel*
16-Mei-2024	Pagi	1. PK-APB *Preflight* dan *Engine Ground Run*
17-Mei-2024	Pagi	1. PK-BYL *Engine External Magneto Timing* 2. PK-APD *Inspection* 50 *hours*
18-Mei-2024	Libur	*Weekend*
19-Mei-2024	Libur	*Weekend*
20-Mei-2024	Siang	1. PK-BYR *Refueling* dan *Refill Oil*
21-Mei-2024	Siang	1. PK-ARX - *Cleaning Oil Temperature* - *Servicing Magneto Timing* - *Clean Spark Plug*
22-Mei-2024	Siang	1. PK-APD *Refueling* dan *Refill Oil*
23-Mei-2024	Libur	Libur Hari Raya Waisak
24-Mei-2024	Libur	Libur Hari Raya Waisak
25-Mei-2024	Libur	*Weekend*
26-Mei-2024	Libur	*Weekend*
27-Mei-2024	Pagi	1. PK-APA *Inspection* 100 *Hours* 2. PK-APF *Inspection* 50 *Hours*
28-Mei-2024	Pagi	1. PK-BYS *Inspection* 50 H*ours* 2. PK-BYR *Inspection* 50 H*ours*
29-Mei-2024	Pagi	1. PK-APC *Preflight* dan *Engine Ground Run*
30-Mei-2024	Pagi	1. PK-BYJ *Inspection* 50 H*ours*
31-Mei-2024	Pagi	1. PK-BYC *Inspection* 50 H*ours*

Tabel 4. 3 Rekap Data Kegiatan OJT Bulan Juni 2024

Tanggal	Shift	Kegiatan
1-Juni-2024	Libur	Hari Lahir Pancasila
2-Juni-2024	Libur	Weekend
3-Juni-2024	Siang	1. PK-BYL *Inspection* 100 *Hours*
4-Juni-2024	Siang	1. PK-BYD *Servicing Seat Adjustable Height Broken* 2. PK-APC *Replace CHT* dan *EGT IN Cylinder* 2
5-Juni-2024	Siang	1. PK-BYL *Refueling, Refill Oil*
6-Juni-2024	Siang	1. PK-BYC *Servicing Spring Seat Broken*
7-Juni-2024	Siang	1. PK-BYD *Inspection* 100 *Hours*
8-Juni-2024	Libur	Weekend
9-Juni-2024	Libur	Weekend
10-Juni-2024	Pagi	1. PK-ARX *Replace Right Magneto In Left Engine Due To Drop Exceed 150*
11-Juni-2024	Pagi	1. PK-APD *Preflight* dan *Engine Ground Run*
12-Juni-2024	Pagi	1. PK-APD *Inspection* 100 *Hours*
13-Juni-2024	Pagi	1. PK-ARX *Servicing High Oil Temperature*
14-Juni-2024	Pagi	1. PK-APF *Inspection* 100 Hours
15-Juni-2024	Libur	Weekend
16-Juni-2024	Libur	Weekend
17-Juni-2024	Libur	Libur Idul Adha
18-Juni-2024	Libur	Libur Idul Adha
19-Juni-2024	Siang	1. PK-APC *Refueling, Refill Oil*
20-Juni-2024	Siang	1. PK-APO - *Servicing light indicator up And Down Landing Gear* - *Servicing Low Vacuum* 2. PK-BYR *Inspection 100 Hours*
21-Juni-2024	Siang	1. PK-BYM *Refueling, Refill Oil*
22-Juni-2024	Libur	Weekend
23-Juni-2024	Libur	Weekend
24-Juni-2024	Pagi	1. PK-APF Replace Left Main Wheel 2. PK-BYP *Inspection* 50 *Hours*
25-Juni-2024	Pagi	1. PK-BYS Replace Left Main Wheel 2. PK-APP Fill Bleed System Due To Lack Of Fluid 3. PK-APL *Inspection* 50 Hours
26-Juni-2024	Pagi	1. PK-BYC Engine External Magneto Timing
27-Juni-2024	Pagi	1. PK-APD *Preflight* dan E*ngine Ground Run*
28-Juni-2024	Pagi	Pengambilan Nilai Oleh Instruktur OJT

Dari banyaknya *daily activity report* selama OJT di API Banyuwangi seperti*: line maintenance*, *aircraft structure* (*heavy maintenance*), dan *engine* kemudian penulis merekap kegiatan tersebut mulai dari bulan april sampai juni. Pada kegiatan *line maintenance* penulis memperoleh 46 hari secara efektif di API Banyuwangi, penulis melakukan kegiatan *line maintenance* yang terdiri dari: *preflight, ground run, refueling, refill oil*, kegiatan tersebut dilakukan dalam pengawasan *engineer*. Selain itu ada salah satu kegiatan *line maintenance* pada tanggal 03-april-2024 dilakukan *servicing flaps* karena *flaps fail to retract* pada pesawat PK-BYM di *apron*, servicing tersebut dilakukan oleh *engineer* bedasarkan referensi AMM.

Pada kegiatan *aircraft structure* (*heavy maintenance*) penulis memperoleh 18 hari secara efektif di API Banyuwangi, penulis melakukan kegiatan *aircraft structure* (*heavy maintenance*) yang terdiri dari beberapa *trouble* baik *engineer* menemukan *trouble* pada *preflight* dan *engine ground run* atau *engineer* mendapatkan laporan dari pilot tersebut seperti pada tanggal 25-06-2024 penulis melakukan *replace left main wheel* pada pesawat PK-BYS yang dilakukan dalam pengawasan *engineer*, kegiatan tersebut dilakukan ketika *engineer* menemukan *wheel spot* yang kemungkinan disebabkan oleh penggunaan jam terbang atau *hard landing*.

kegiatan *engine* di dalam *daily activity report* penulis memperoleh 20 hari secara efektif di API Banyuwangi, kegiatan *engine* di dalam *daily activity* adalah *schedule maintenance* atau inspeksi, kegiatan tersebut dilakukan bedasarkan *maintenance limit* di *ata chapter* 5 seperti pada tanggal 27-05-2024 dilakukan *inspection* 100 *hours* pada pesawat APA, kegiatan inspeksi yang dilakukan oleh penulis tersebut meliputi *flight control cable inspection, engine oil change, clean air filter, clean spark plug* dll. Kegiatan tersebut dilakukan dalam pengawasan *engineer* dan sesuai dengan AMM.

Bedasarkan semua kegiatan penulis selama OJT di API banyuwangi diperoleh 51 hari OJT secara efektif. Hal tersebut dikarenakan banyaknya libur selama OJT di API Banyuwangi seperti libur hari raya, hari buruh, dll.

Tabel 4. 4 Kegiatan selama *OJT* di API Banyuwangi

NO	JAM	KEGIATAN
1	05.15	Persiapan kerja (*shift* pagi)
2	05.30 - 06.45	*Prepare* pesawat, *Pre-flight check, Ground Run, Refueling*
3	06.45 - 07.30	*Break* dan *briefing*
4	07-30 -11.00	Waktu kerja
5	11.00 - 13.00	Ishoma
6	13.00 - 15.00	Waktu kerja (shift siang)
7	15.00 - 16.00	Ishoma
8	16.00 - 17.15	Closing, refueling
9	17.15 - 18.15	Ishoma
10	18.15 - 19.00	Persiapan pulang

4.4 *Troubleshoot*

Taruna *OJT* yang terlibat secara aktif dalam *inspection* dan *maintenance* serta *troubleshoot* pesawat Cessna 172S Skyhawk selama program *OJT* di API banyuwangi. penulis tidak hanya memperoleh pengetahuan teoritis, tetapi juga menemukan studi kasus praktis yang di ambil dari kegiatan selama *OJT*, studi kasus memungkinkan penulis sebagai penunjang untuk mengembangkan laporan *OJT* selama di API Banyuwangi serta menambah pemahaman tentang *maintenance* pesawat. secara garis besar kegiatan *OJT* ini mengajarkan penulis tentang tahapan-tahapan *maintenance* pesawat udara, Adapun urutan *maintenance* sebagai berikut :

1. Identifikasi Masalah

   Ada beberapa factor dilakukannya *maintenance* diantaranya seperti mendapatkan laporan taruna penerbang mengenai *trouble* pada pesawat atau engineer sendiri yang mecari atau menemukan *trouble* pada pesawat pada saat baik *inspection* atau *engine ground run*. Fungsi dari identifikasi adalah untuk mengetahui berbagai masalah atau kebutuhan pada pesawat untuk mempermudah dalam menyusun maintenance program.

2. *Disassembly*

   Disassembly adalah kebalikan daripada proses *assembly* dimana *disassembly* merupakan kegiatan melepas komponen pada *engine* maupun bagian pesawat yang ada di suatu system pesawat udara. Penting untuk persiapan sebelum melaksanakan proses *disassembly* seperti pengadaan wadah tempat menyimpan, bagian bagian komponen atau alat kerja harus ditata secara teratur pada *plate* saat dipindahkan serta di beri label. Hal ini akan mempermudah *inspection* dan mencegah dari kerusakan atau kehilangan *parts* kecil seperti *nut* dan *bolt*.

3. *Inspection*

   Pemeriksaan atau *visual inspection* dilakukan guna untuk mencari *defect* serta mengecek semua *parts* atau komponen pesawat memastikan apakah masih layak digunakan atau masih sesuai standard. Proses *inspection* sesuai FAA di bagi menjadi tiga kategori yaitu : *Visual inspection, Structural inspection,* dan *dimension inspection*. *Inspection* sudah ditentukan berdasarkan *Maintenance Manual* Cessna 172S Skyhawk.

4. *Repair* atau *replacement*

   Repair dan replacement adalah kegiatan memperbaiki atau mengganti suatu bagian atau part-part pada pesawat yang mengalami penurunan performance yang dilakukan dalam interval waktu tertentu secara berkala. Komponen yang tidak dapat di perbaiki harus di *replace* seperti aus pada *wheel* dikarenakan terjadi *friction* pada saat pesawat landing Tujuan dari *Repair* dan *Replace* untuk mengembalikan performa engine dan struktur lainnya agar mendekati spesifikasi sesuai standard FAA serta layak untuk terbang.

5. *Re-assembly/installation*

   Reassembly adalah tahap dimana komponen yang sudah dimaintenance baik repair atau replace akan dipasang kembali seperti kondisi semula. Langkah *installation* semua bagian pesawat sudah tercantum pada Aircraft Maintenance Manual.

6. *Functional Test*

   Functional Test adalah tahapan untuk mengetahui dari hasil proses *maintenance* yang telah dilaksanakan, untuk memastikan komponen dapat bekerja normal dan sesuai dengan fungsinya, Pada *functional test* juga di lakukan *engine groun run*

7. *Return to Service*

   Return to Service merupakan langkah penting untuk memverifikasi bahwa semua pekerjaan yang dilakukan telah sesuai dengan dokumentasi dan catatan pesawat, serta memeriksa apakah pesawat telah menjalani pemeliharaan sesuai prosedur. Jika semua syarat terpenuhi, pesawat dianggap telah kembali ke kondisi yang memungkinkannya untuk dioperasikan kembali, dan statusnya diubah menjadi RTS (*Return To Service*). Dengan demikian, pesawat siap untuk digunakan kembali setelah melalui proses ini.

Ke tujuh point tersebut diimplementasikan oleh penulis selama pelaksanaan OJT. Berikut akan disajikan studi kasus yang memenuhi point point diatas dan servicing yang telah dikerjakan :

1. *Replace Vacuum Due To Low Vacuum.*
2. *Flaps Fail To Retract.*
3. *Magneto Drop Exceeds* 150.
4. *Replace Right Magneto In Left Engine Seneca V Due To Drop Exceed 150*
5. *Replace CHT And EGT due to defect burn.*
6. *Replace Fuel Shutoff Valve Control Cable*
7. *Replace Rockerbox Gasket Due To Oil Leak*
8. *Replace Left Main Wheel*
9. *Pitot Tube Servicing*
10. *Servicing Seat Adjustable Height Broken*

4.5 Penyelesaian *Troubleshoot*

4.5.1 *Replace Vacuum Due To Low Vacuum*

1. Identifikasi masalah

pada saat *in flight* dengan pesawat PK-BYC Pada tanggal 08-05-2024 terjadi *low vacuum* pada rpm 2600 sehingga *engineer* memutuskan untuk *troubleshoot* pada *vacuum pump* seperti pada gambar 4. 1.

CESSNA AIRCRAFT COMPANY
MODEL 172
MAINTENANCE MANUAL

VACUUM SYSTEM - TROUBLESHOOTING

1. **Troubleshooting**

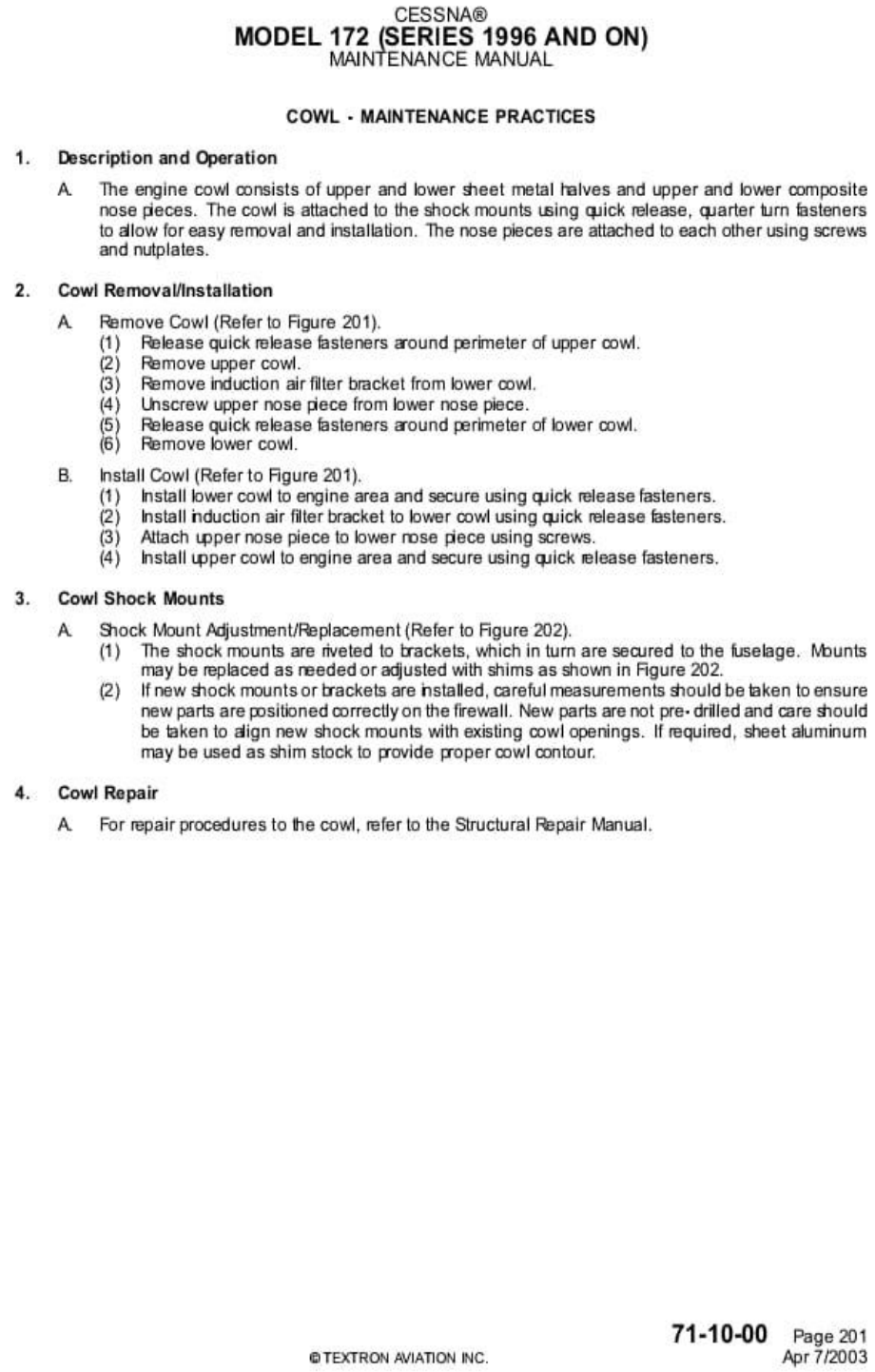
TROUBLE	PROBABLE CAUSE	REMEDY
OIL IN DISCHARGE.	Damaged engine driven seal.	Replace gasket.
HIGH SUCTION.	Vacuum regulator filter clogged.	Check filter for obstructions.
LOW SUCTION.	Vacuum regulator leaking.	Replace vacuum regulator.
	Vacuum pump failure.	Substitute known good pump and check pump suction. Replace vacuum pump as required.
LOW PRESSURE.	Vacuum regulator leaking.	Replace safety valve.
	Vacuum pump failure.	Substitute known good pump and check pump pressure. Replace vacuum pump as required.

Gambar 4. 1 *Troubleshoot Vacumm* Pump referensi AMM 37-10-00

Gambar 4. 2 *Low vacuum* pada Garmin 1000

2. *Removal*

Pertama kali yang dilakukan tahap *removal* adalah melepas *cowl engine* sesuai dengan referensi AMM *chapter* 71 menggunakan *tool phillip screw driver* seperti pada gambar 4.3



CESSNA®
MODEL 172 (SERIES 1996 AND ON)
MAINTENANCE MANUAL

COWL - MAINTENANCE PRACTICES

1. Description and Operation

A. The engine cowl consists of upper and lower sheet metal halves and upper and lower composite nose pieces. The cowl is attached to the shock mounts using quick release, quarter turn fasteners to allow for easy removal and installation. The nose pieces are attached to each other using screws and nutplates.

2. Cowl Removal/Installation

A. Remove Cowl (Refer to Figure 201).
(1) Release quick release fasteners around perimeter of upper cowl.
(2) Remove upper cowl.
(3) Remove induction air filter bracket from lower cowl.
(4) Unscrew upper nose piece from lower nose piece.
(5) Release quick release fasteners around perimeter of lower cowl.
(6) Remove lower cowl.

B. Install Cowl (Refer to Figure 201).
(1) Install lower cowl to engine area and secure using quick release fasteners.
(2) Install induction air filter bracket to lower cowl using quick release fasteners.
(3) Attach upper nose piece to lower nose piece using screws.
(4) Install upper cowl to engine area and secure using quick release fasteners.

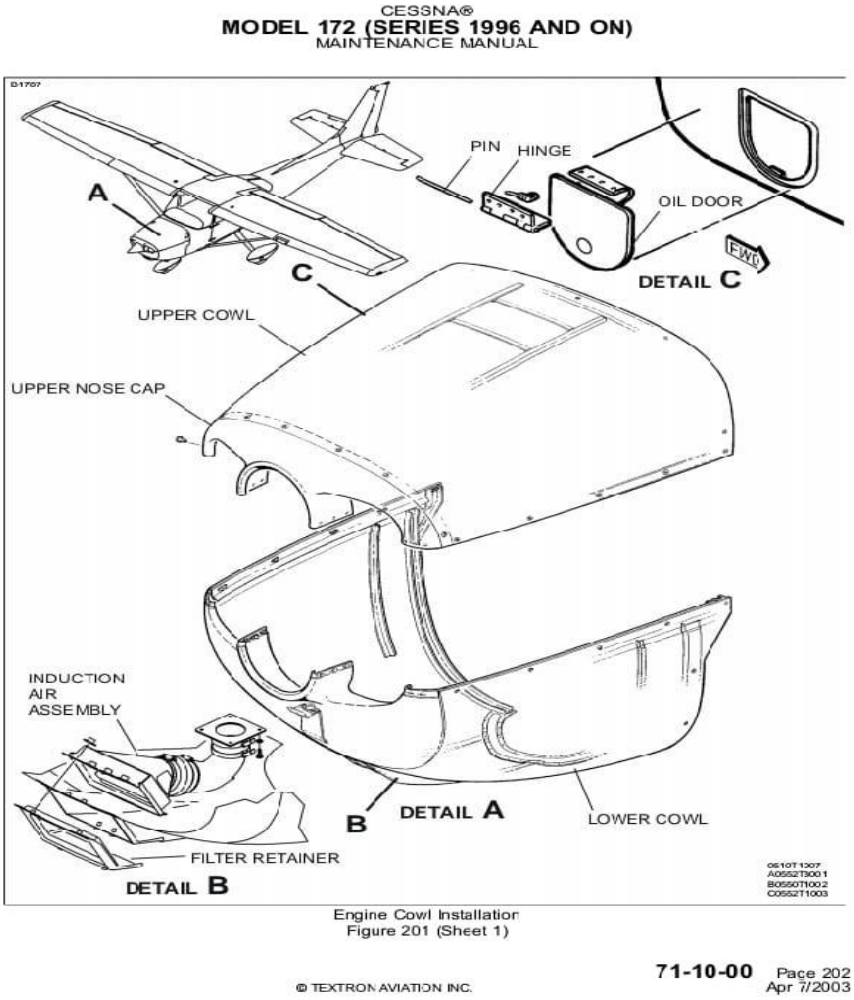
3. Cowl Shock Mounts

A. Shock Mount Adjustment/Replacement (Refer to Figure 202).
(1) The shock mounts are riveted to brackets, which in turn are secured to the fuselage. Mounts may be replaced as needed or adjusted with shims as shown in Figure 202.
(2) If new shock mounts or brackets are installed, careful measurements should be taken to ensure new parts are positioned correctly on the firewall. New parts are not pre-drilled and care should be taken to align new shock mounts with existing cowl openings. If required, sheet aluminum may be used as shim stock to provide proper cowl contour.

4. Cowl Repair

A. For repair procedures to the cowl, refer to the Structural Repair Manual.

Gambar 4. 3 *AMM 71-10-00*



Gambar 4. 4 *Cowl Engine* sumber AMM 71-10-00

Setelah melepas *engine cowl* selanjutnya melepas komponen *vacuum pump* sesuai dengan *AMM 37-10-00 page 201* seperti pada lampiran 7 guna untuk di inspeksi

3. Inspeksi

   Inspection dilakukan untuk mengetahui permasalahan yang ada di *vacuum pump.* Pada saat inspeksi ditemukan bahwa *brush* yang ada di dalam vacuum pump sudah aus yang disebabkan karena *friction*, bahkan ditemukan salah 1 brush mengalami patah seperti pada gambar 4. 5 dan gambar 4. 6.

Gambar 4. 5 Komponen *vacuum pump*

Gambar 4. 6 *Brush* yang mengalami patah

4. Replace

   Setelah mengetahui permasalahan pada *vacuum pump* yakni terjadi aus dan patah pada *brush* maka engineer memutuskan untuk dilakukan tindakan *replace* pada *vacuum pump*.

5. *Installation*

   Setelah dilakukan replace kemudian dilakukan *installation* dengan menutup engine cowl menggunakan screwdriver philip

6. *Functional Test*

   Setelah dilakukan *installation* kemudian dilakukan *ground run* guna untuk mengecek dan memastikan bahwa indikator *vacuum* menunjukan normal pada 1200 rpm yaitu pada *green arc*.

7. *Return To Service*

   Setelah indikator *vacuum* normal kemudian *engineer* merilis pesawat tersebut agar pesawat bisa digunakan oleh taruna penerbang.

4.5.2 *Clean Switch Flap Due To Flaps Fail To Retract*

1. Identifikasi masalah

   Pada tanggal 03 april 2024 dilakukan *troubleshoot* setelah mendapat adanya laporan dari taruna Jason prodi penerbang ke *engineer* terjadi *lag* atau macet pada *flap* di pesawat PK-BYM. Bedasarkan AMM kemungkinan *trouble* tersebut disebabkan karena *defective* atau *disconnected flaps up operating switch* seperti pada gambar 4. 7.

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TROUBLE	PROBABLE CAUSE	REMEDY
FLAPS FAIL TO RETRACT	Defective or disconnected flaps UP operating switch.	Check continuity of switch. Connect or replace switch.
FLAPS FAIL TO EXTEND	Defective or disconnected flaps DOWN operating switch.	Check continuity of switch. Connect or replace switch.

Gambar 4. 7 AMM *troubleshooting flap control system Cessna 172 Skyhawk*

2. *Servicing*

   Setelah diidentifikasi masalah engineer melakukan *servicing* dengan memberikan contact cleaner guna untuk membersikan komponen elektronik khususnya pada *switch* seperti pada gambar 4. 8.

Gambar 4. 8 *Servicing* pada *switch flaps*

3. *Operational check*

   Setelah dilakukan *cleaner* pada *switch flap* kemudian dilakukan *operational check* sesuai *AMM 27-50-00 page 209 sepert* pada *flaps* dari *full up position* sampai *full down position* guna memastikan apakah sudah normal atau belum seperti pada gambar 4. 9.

Gambar 4. 9 *Lever flaps*

4. *Return to service*

   Setelah *flaps* normal kemudian engineer melakukan rilis pada pesawat tersebut.

4.5.3 *Engine Timing Due To Magneto Drop Exceed 175*

1. Identifikasi masalah

   Pada tanggal 17 mei 2024 *engineer* perlu melakukan *preflight* dan *engine ground run* pada pesawat PK-BYL sebelum di gunakan oleh taruna penerbang guna memastikan baik *engine* dan *airframe* dalam keadaan layak untuk terbang. Pada saat *ground run* di 1800 rpm guna untuk mengecek *magneto drop* terjadi magneto drop melebihi 150 rpm pada *magneto* kanan serta di *double check* juga sama hasilnya sehingga *engineer* memutuskan untuk dilakukan *troubleshoot* seperti pada gambar 4. 10.

ENGINE WILL NOT IDLE OR RUN PROPERLY.	Spark plugs defective, improperly gapped or fouled by moisture or deposits.	Clean, regap and test plugs. Replace if defective.
	Defective ignition harness.	If no defects are found by a visual inspection, check with a harness tester. Replace defective parts.

TROUBLE	PROBABLE CAUSE	REMEDY
	Defective magneto.	Refer to Ignition System - Maintenance Practices.
	Impulse coupling pawls remain engaged.	Listen for loud clicks as impulse coupling operates. Remove magneto and determine cause. Replace defective magneto.
	Spark plugs loose.	Check and install properly.

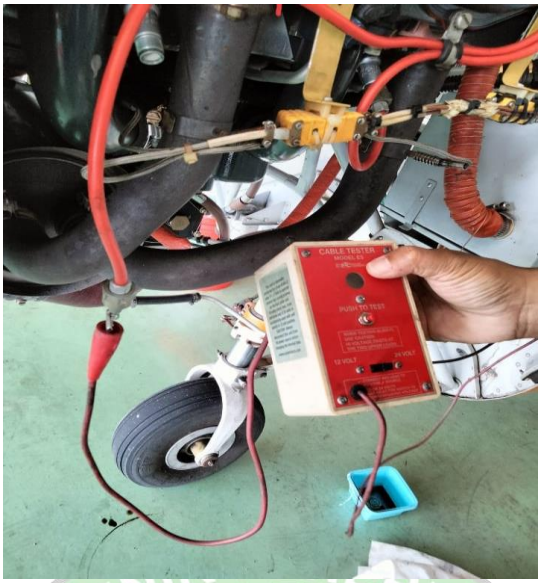
Gambar 4. 10 *Troubleshoot ignition system* (sumber *AMM Cessna 172 Skyhawk*)

2. *Removal*

   yang pertama dilakukan adalah membuka *cowling engine* sesuai dengan referensi ata *chapter 71* guna untuk mempermudah *troubleshoot* pada komponen *engine*.

3. *Servicing*

   Lahkah pertama adalah mengecek *spark plug* pada setiap *cylinder* dengan cara membersihkan karbon hasil pembakaran agar tidak menutup gap-nya. Kemudian melakukan pengecekan *ignition hardness* dengan menggunakan *harness tester* guna mengetahui apakah *hardness* masih bisa digunakan atau tidak seperti pada gambar 4. 11.



Gambar 4. 11 *hardness tester*

Setelah mengecek hardness dan hasilnya masih bisa digunakan kemudian mengecek *engine timing* melalui *magneto* sesuai dengan referensi AMM *ata chapter* 74 tentang *engine external timing adjustment*.

Tabel 4. 5 *Engine External Timing Adjustment* sumber AMM 74-10-00

No	*Engine External Timing Adjustment*
1	Pastikan *ignition* pada posisi *off*
2	Lepas *engine cowl* sesuai dengan referensi AMM *chapter* 71
3	Lepas 1 *spark plug* pada *cylinder* pertama
4	Putar *propeller* dan pastikan *cylinder* pertama pada 25 derajat sebelum TDC (*top dead center*) pada *compression stroke*
5	Hubungkan *magneto timing lights* diantara *engine ground* dan *P lead* terminal pada *magneto*
6	Longgarkan *mount clamp* pada *magneto* sehingga magneto bisa diputar pada *accessory case*.
7	Putar *ignition switch* diposisi *both*
8	Putar *magneto* berlawanan arah jarum jam sampai *timing lights* menyala, menunjukan bahwa *contact breaker poins* terbuka.
9	Ketika *magneto* telah selesai diatur kemudian kencangkan *nut* dengan *torsi* 17 foot pound (23 N-m.).

3. Magneto-to-Engine External Timing Adjustment

A. Adjust the Magneto-to-Engine Timing (Refer to Figure 201).
(1) Make sure the ignition is in the OFF position.
(2) Remove the engine cowl. Refer to Chapter 71, Engine Cowl - Maintenance Practices.
(3) Remove a minimum of one spark plug from each cylinder.

(4) Turn the propeller in the normal direction of movement until each impulse coupling releases as the number one cylinder moves near TDC (Top Dead Center) on the compression stroke.

NOTE: You will hear a click sound from the impulse couplings when they release.

(5) Turn the propeller in the opposite direction of normal movement to approximately 30 degrees BTDC (Before Top Dead Center) on the number one cylinder compression stroke.
(6) Make sure that cylinder number one is at 25 degrees BTDC (Before Top Dead Center) on the compression stroke.
(7) Connect a standard aircraft magneto timing light between a acceptable engine ground and the P lead terminal of the magneto.

NOTE: Most standard aircraft magneto timing lights show open points with a Light On condition and/or a signal that you can hear.

(8) Loosen the mount clamps that attach the magneto to the accessory case so that the magneto will turn on the accessory case.
(9) Turn the ignition switch to the BOTH position.
(a) Look at the magneto from the aft side of the engine.
1 If the timing light is luminated, turn the magneto frame clockwise until the timing light shuts off.
2 Turn the magneto frame counter-clockwise until the timing light comes on, which shows that the contact breaker points are open.

CAUTION: Do not torque the nuts more than 17 foot-pounds (23 N-m.) or the mounting flange can crack.

(10) With the magneto set in position, first tighten each nut to 8 foot-pounds (10 N-m).
(11) Tighten each nut from one side to another, to a torque of 17 foot-pounds (23 N-m).
(12) Complete a check of the magneto timing to make sure it has not changed. Refer to Magneto-to-Engine Timing Check.

Gambar 4. 12 AMM *Engine External Timing*
(sumber *AMM Cessna 172 Skyhawk 74-10-00*)

Gambar 4. 13 *Engine External Timing* pesawat PK-BYL

4. *Installation*

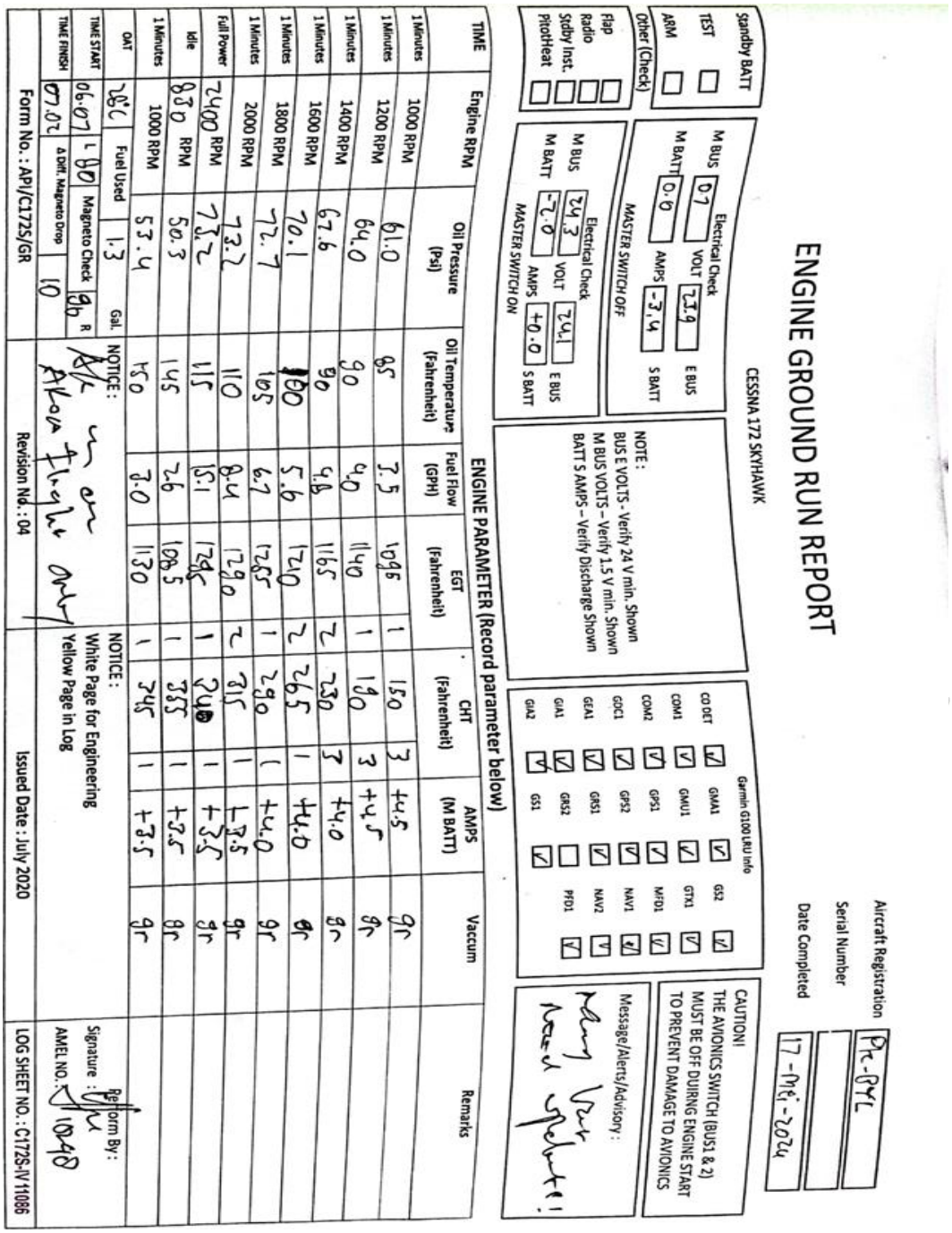
   Setelah *engineer* melakukan *servicing* setelah itu dilakukan *installation* dengan memasang *spark plug* dan menutup *engine cowl.*

5. *Testing ground run*

   Setelah melakukan *reassembly* kemudian dilakukan *ground run* guna untuk mengecek *magneto drop* di 1800 rpm. Hasil engine ground run seperti pada gambar 4.14

6. *Return to service*

   Setelah selesai *ground run* dan pesawat telah layak untuk dioperasikan kemudian *engineer* merilis pesawat tersebut sperti pada gambar 4.14.



Gambar 4. 14 *Ground run* 17 mei 2024 PK-BYL

4.5.4 *Replace Magneto Seneca V Due To Drop Exceeds 150*

1. Identifikasi masalah

   Pada tanggal 10 juni 2024 dilakukan *replace magneto* pada Seneca V PK-ARX dikarenakan *engineer* menemukan *troubleshoot* pada saat *engine ground run*, yaitu *magneto* kanan engine kiri drop melebihi 150 rpm

sehingga perlu di lakukan *troubleshoot* serta sebelumnya mendapatkan laporan *engine vibrate* oleh pilot.

2. *Removal*

   Removal dilakukan dengan melepas *engine cowling* terlebih dahulu setelah itu melepas semua *spark plug* dan kedua *magneto* pada *engine* sesuai dengan AMM guna untuk dilakukan inspeksi.

3. Inspeksi

   Langkah inspeksi dilakukan untuk mengetahui apakah terdapat *defect* pada komponen serta memastikan komponen tersebut masih layak digunakan, pada saat melepas *spark plug* ditemukan *gap* pada *spark plug* hampir tertutup oleh karbon seperti pada gambar 4. 15., itulah salah satu penyebab *magneto drop* melebihi limitnya. *Spark plug* tersebut di bersihkan dan diberi *Loctite LB 8150*

Gambar 4. 15 *Spark plug* penuh dengan *carbon*

Gambar 4. 16 Hasil *spark plug* yang telah dibersihkan

Setelah melakukan inspeksi pada *spark plug* dan membersikannya kemudian dilakukan inspeksi pada *magneto*, pada saat melakukan inspeksi pada *magneto* kanan *engine* kiri ditemukan banyak *defect* di dalamnya diantaranya : banyak karbon, *cam* dan *rasio small gear* timing aus, *magneto casing* distributor *burn*, *bolt corrosion*. Seperti pada gambar 4. 17 dan gambar 4. 18.

Gambar 4. 17 *Magneto casing distributor burn*

Gambar 4. 18 *Rasio small gear timing*

4. *Servicing*

   Setelah mengetahui *defect* pada *magneto* melalui tindakan inspeksi kemudian *engineer* memutuskan untuk melakukan *replace* pada *magneto* kanan *engine* kiri, *engineer* melakukan tindakan *replace* dikarenakan komponen *magneto* kanan *engine* kiri sudah tidak layak untuk digunakan.

5. *Installation*

   Setelah dilakukan *servicing* kemudian dilakukan *installation* dengan memasang *spark plug* pada setiap *engine* dan memasang *magneto* kanan *engine* kiri serta memasang *engine cowl*, semua itu dilakukan sesuai dengan AMM.

6. *Functional test*

   Setelah dilakukan *reassembly* kemudian melakukan *engine ground run* guna memastikan engine sudah layak digunakan seperti pada gambar 4. 19.

Gambar 4. 19 *Functional test*

7. *Return to service*

   Setelah engineer melakukan *engine ground run* kemudian engineer merilis pesawat tersebut untuk digunakan.

4.5.5 *Replace CHT And EGT due to Defect Burn*

1. Identifikasi masalah

   Pada tanggal 04 juni 2024 saat *engineer* melakukan *engine ground run* PK-APC ditemukan *trouble* pada indikator *CHT* dan *EGT cylinder* 2, *CHT* dan *EGT* tersebut tidak terbaca oleh sensor kemudian *engineer* memutuskan untuk melakukan *troubleshoot*.

2. *Removal*

   Sebelum melakukan *troubleshoot* terlebih dahulu *engineer* membuka *engine cowl* guna akan dilakukan inspeksi pada sensor *CHT* dan *EGT* terlebih dahulu sebelum memasuki *troubleshoot* pada garmin *GEA* 71

3. Inspeksi

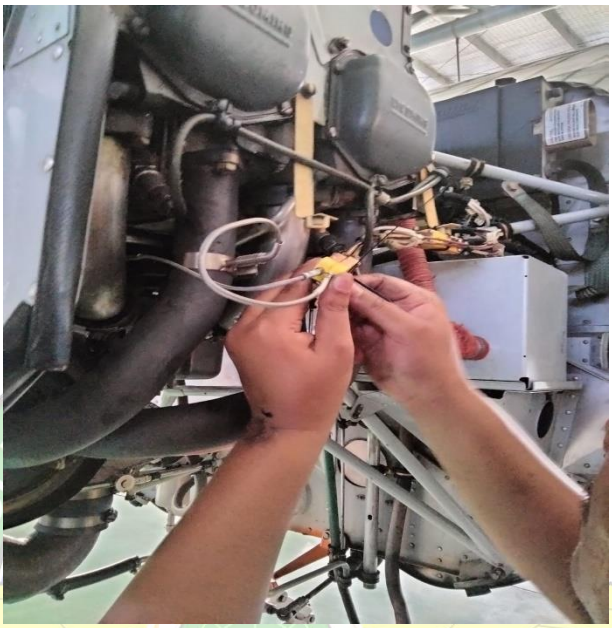
   Inspeksi dilakukan oleh engineer guna memeriksa sensor *CHT* dan *EGT* dengan cara melepas sensor tersebut sesuai dengan *AMM 77-20-00 page 201-204* seperti pada lampiran 8, setelah melepas sensor tersebut *engineer* melakukan inspeksi dan ditemukan *defect burn* pada sensor akibat kabel tis terputus sehingga *wire CHT* dan *EGT* yang menghubungkan ke *GEA* 71 menempel pada *intake* dan *exhaust*. Seperti pada gambar 4. 21.

Gambar 4. 20 Inspeksi sensor *CHT* dan *EGT*

Gambar 4. 21 *Defect burn* pada *wire* yang menghubungkan sensor ke *GEA* 71

4. *Replace*

   Setelah dilakukan inspeksi kemudian *engineer* memutuskan *replace* sensor *CHT* dan *EGT* dikarenakan *wire* yang menghubungkan sensor ke *GEA* 71 mengalami *burn*



Gambar 4. 22 memasang sensor *EGT* dan *CHT*

5. *Installation*

   Dilakukan *installation* setelah selesai mengganti komponen sensor *CHT* dan *EGT* dengan menutup *cowling* pada *engine*.

6. *Functional test*

   Kemudian *engineer* melakukan *engine ground run* guna memastikan sensor *CHT* dan *EGT* telah berfungsi dan terbaca pada indikator *engine parameter*

7. *Return to service*

   Setelah sensor *CHT* dan *EGT* telah terbaca oleh garmin kemudian *engineer* merilis pesawat tersebut siap dan layak untuk terbang

4.5.6 *Replace Fuel Shutoff Valve Control Cable*

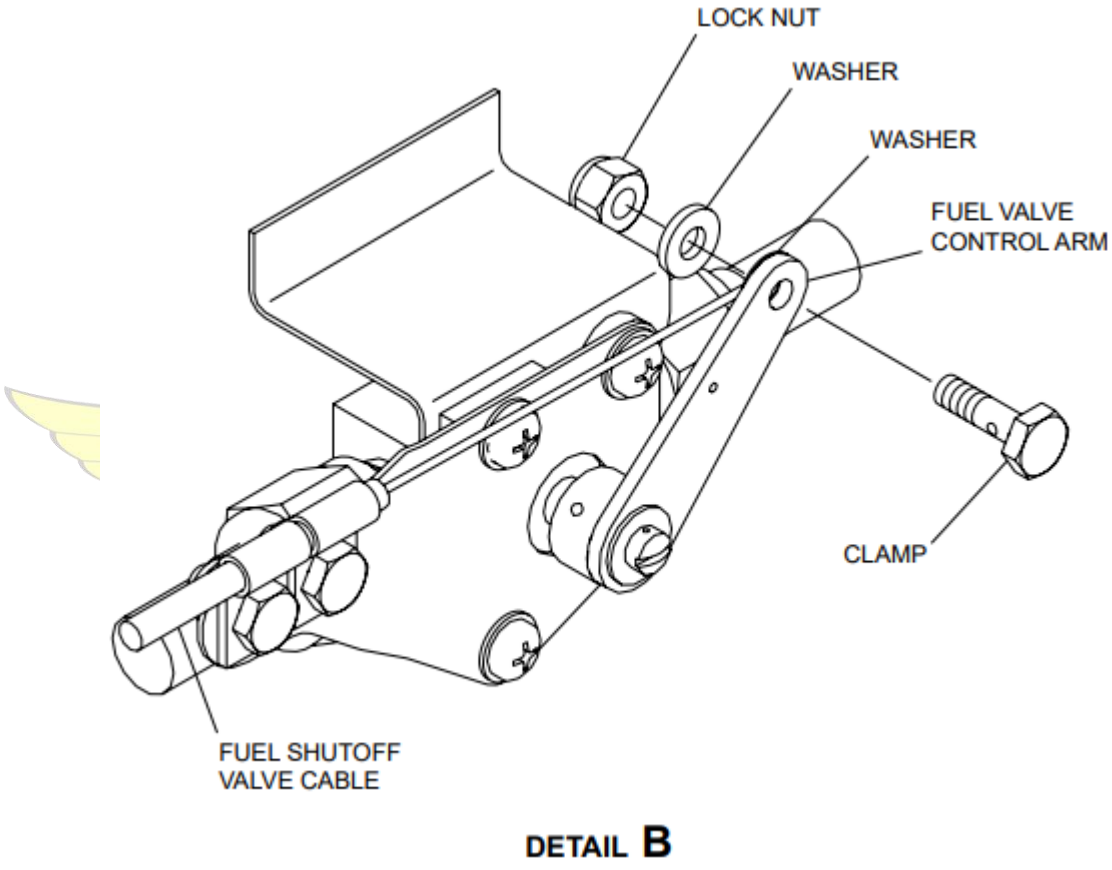
1. Identifikasi masalah

   Pada tanggal 4 april 2024 *engineer* mendapat laporan dari pilot bahwa *fuel shutoff valve control cable* terputus pada pesawat PK-BYD. Kemudian

engineer memutuskan untuk membawa pesawat tersebut ke hanggar c guna untuk dilakukan *maintenance.*

2. *Removal*

   Dilakukan *removal* guna untuk melepas karpet (*footwell carpet*) kaki dari *copilot rudder pedal* lalu lepaskan *screw* dari pelindung pedal menggunakan *screwdriver philip* dan lepaskan *lock nut* pada gambar 4. 23 menggunakan *wrench* 7/16 sesuai AMM 28-20-00 page 215 seperti pada lampiran 9.



Gambar 4. 23 *Fuel shutoff control cable*
Sumber AMM Cessna 172S Skyhawk

3. *Inspection*

   Setelah *screw* dan *lock nut* terlepas selanjutnya dilakukan inspeksi pada gambar 4.24 ternyata *shutoff valve cable* nya putus dikarenakan pilot terlalu kencang saat menarik.

Gambar 4. 24 *Fuel shutoff valve control cable* terputus

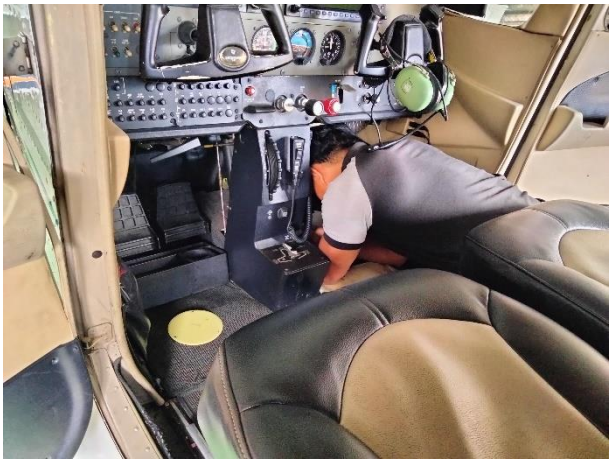
4. *Replace*

   Pada gambar 4.25 setelah dilakukan inspection kemudian engineer memutuskan untuk melakukan *replace* pada *fuel shutoff valve control cable* dengan yang baru sesuai dengan part number yaitu S1533-9

Gambar 4. 25 *Replace pada fuel shutoff valve control cable* sesuai *part Number* S1533-9

5. *Installation*

   Setelah dilakukan *replace* pada *fuel shutoff valve control cable* dengan yang baru kemudian pada gambar 4. 26 *engineer* melakukan *installation* pada komponen sesuai dengan AMM ata chapter 28-20-00 page 215, pasang *lock nut* lalu kencangkan hingga minimum 15 inch/pouds dan pastikan *control arm* bergerak dengan lancar . Setelah itu kencangkan *screw* dan pasang kembali *copilot's rudder pedal shields.*



Gambar 4. 26 *Installation fuel shutoff valve control cable* sesuai AMMCessna 172S Skyhawk.

6. *Functional Test*

   Setelah dilakukannya *installation* pada *shutoff valve cable*, selanjutnya melakukan *functional test* pada *shutoff valve* dengan cara *pull* and *push fuel shutoff control cable knob* untuk memastikan sambungan kabel bergerak dengan lancar .

7. *Return* to *Service*

   Setelah melakukan *functional test* dan memeriksa bahwa *shutoff valve* tidak terdapat masalah dan berfungsi dengan baik, maka pesawat Cessna 172 S PK - BYD dapat dikatakan layak terbang dan kembali beroperasi.

4.5.7 *Replace Rockerbox Gasket Due To Oil Leak*

1. Identifikasi masalah

   Pada tanggal 22 april 2024 sore, setelah melaksanakan pengantaran direktur terdapat *trouble* pada pesawat Seneca Piper V (PK-ARY) yang dilaporkan oleh pilot kepada *engineer*. Dikarenakan sudah menjelang malam sehingga engineer memutuskan untuk dilakukan *troubleshoot* besok pada tanggal 23 april 2023. Perintah kerja atau *work order* ditunjukan pada lampiran 8.

PIPER AIRCRAFT, INC.
PA-34-220T, SENECA IV–V
MAINTENANCE MANUAL

CHART 2 (Sheet 5 of 6)
TROUBLESHOOTING ENGINE

Trouble	Cause	Remedy
Low oil pressure on engine gauge.	Insufficient oil in oil sump, oil dilution or using improper grade of oil for prevailing ambient temperature.	Add oil or change oil to proper viscosity.
	High oil temperature.	Defective oil temperature control valve in oil cooler; restriction in oil cooler. Replace valve or overhaul oil cooler.
	Leaking, damaged or loose oil line connections - restricted screens and filter.	Check for restricted lines and loose connections, and for partial plugged oil filter and screens. Clean parts, tighten connections, and replace defective parts.
	Leaking oil seal in turbocharger.	Check for oil in turbocharger exhaust outlet. Replace turbocharger.
	Defective check valve in turbocharger oil supply line.	Disassemble and clean valve or replace.
High oil temperature.	Low oil supply.	Fill to proper level with specified oil.
	Oil cooler air passages clogged.	Clean thoroughly.
	Defective oil temperature control valve, or valve held open by debris.	Remove valve and clean valve and seat. If condition persists, replace Oil Temperature Control Valve.
	Oil cooler core plugged.	Replace or overhaul oil cooler.
	Oil viscosity too high.	Drain and refill with correct oil see Continental Maintenance Manual, Servicing Oil.
	Prolonged ground operation.	Limit ground operation to a minimum. See aircraft POH.
	Malfunctioning gauge.	Replace gauge.
Poor engine idle cutoff.	Engine getting fuel.	Check fuel control for being in full "IDLE CUTOFF" position. Check auxiliary pump for being "OFF." Check for leaking fuel manifold valve. Replace defective components.

Gambar 4. 27 *Troubleshoot oil leak in Seneca V*

sumber AMM Seneca V

2. *Removal*

   Sebelum melakukan inspeksi terlebih dahulu *engineer* melakukan *removal* yaitu melepas *cowling engine* seperti pada gambar 4. 28.

Gambar 4. 28 *Disassembly engine cowling*

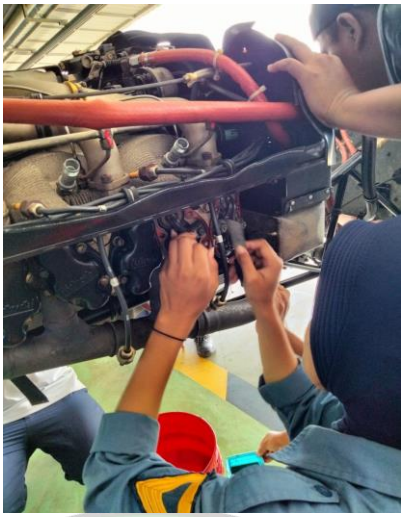
3. *Inspection*

   Setelah dilakukan *removal* kemudian *engineer* menginspeksi semua komponen secara visual dan ditemukan bahwa *oil leak* terletak *di rockerbox* pada gambar 4.29 sehingga *engineer* membuka *srew* pada *head* bagian *rockerbox* menggunakan *flat screwdriver*.

Gambar 4. 29 *Rockerbox gasket*

4. *Replace*

   Pada gambar 4. 30 Setelah diketahui apa penyebab *oil leak* kemudian dilakukan tindakan *replace* pada *gasket* tersebut.



Gambar 4. 30 *Replace rockerbox gasket*

5. *Installation*

   Setelah melakukan *replace* kemudian *engineer* melakukan *installation* yang ditunjukan pada gambar 4. 31 dengan memasang *head rockerbox* kembali

Gambar 4. 31 *Installation pada head rockerbox*

6. *Functional Test*

   Setelah memasang kembali *head rockerbox* kemudian dilakukan *functional test* guna untuk memastikan apakah *oil* sudah tidak *leak* lagi dengan cara *engine ground run* seperti pada gambar 4. 32.

Gambar 4. 32 *Engine ground run Seneca V*

7. *Return to Service*

   Setelah dilakukan pengecekan pada *functional test* dan hasil yang diperoleh adalah *oil* tidak *leak* dan telah *ground run* dengan hasil tidak ada bekas *oil leak*, maka pesawat tersebut dinyatakan *return to service*.

4.5.8 *Replace Left Main Wheel*

1. Identifikasi masalah

   Pada tanggal 25 juni 2024 *engineer* menemukan *defect* pada saat inspeksi preflight secara visual pagi hari, ditemukan bahwa *left main wheel* pada pesawat PK-BYS mengalami *spot* atau aus seperti pada gambar 4. 33, sehingga *engineer* memutuskan untuk membawa pesawat tersebut ke hanggar c untuk dilakukan *replace* pada *left main wheel*.

Gambar 4. 33 *Left main wheel spot*

2. *Removal*

   Dilakukan removal sesuai AMM ata chapter 32-40-00 seperti pada lampiran 10 di mulai dengan memberi *jack* pada *strut left main wheel* pesawat setelah itu melepas *cotter pin* dengan *cutting plier*, lalu lepas *nut* menggunakan *special tool* seperti pada gambar 4. 34, lalu melepas *bolt* yang terpasang pada *back plate assembly* dan *pressure plate assembly* lalu melepas backing plate lalu menarik *wheel* dari *axle* lalu membuka *tire* seperti pada gambar 4. 35.

Gambar 4. 34 *Tool* yang digunakan untuk *melepas left main wheel*

Gambar 4. 35 *Removal left main wheel* PK-BYS

3. *Replace*

   Setelah *removal* kemudian langkah selanjutnya memberi *mont talkum talc* pada *main wheel* yang berfungsi menyerap kadar air didalam *wheel* seperti

pada gambar 4. 36. setelah itu dilakukan pemasangan *main wheel* dengan yang baru seperti pada gambar 4. 36. Kemudian diberi tekanan 42 *psi*

Gambar 4. 36 Memberi *mont talkum talc* pada *wheel*

Gambar 4. 37 Setelah dilakukan *replace* pada *main wheel*

4. *Functional Test*

   Dilakukan oleh *engineer* dengan cara *double check* oleh *engineer* lain guna untuk memastikan *left main wheel* tersebut sudah sesuai dengan standard FAA.

5. *Return to Service*

   Setelah selesai *functional test* dan *left main wheel* bekerja dengan baik kemudian *engineer* merilis pesawat tersebut dan layak untuk digunakan.

4.5.9 *Pitot Tube Servicing*

1. Identifikasi masalah

   Pada tanggal 13 mei 2024 pada saat setelah *ground run* di *apron* dengan menggunakan pesawat PK-BYL, *engineer* mencoba mengetes *pitot* dengan mengarahkan peserta *OJT* untuk meniup *pitot* tersebut dan hasilnya *airspeed indicator* tidak bekerja baik dari monitor *garmin* atau *standby instrument*. Sehingga *engineer* memutuskan membawa pesawat tersebut ke dalam hanggar guna untuk dilakukan *maintenance*.

2. *Removal*

   Setelah pesawat dimasukan di hanggar kemudian *engineer* melakukan *removal* dengan cara melepas *pitot* menggunakan *screwdriver* philip sesuai dengan *AMM ata chapter 34-11-00 page 201* seperti pada gambar 4.38.

Gambar 4. 38 *Removal pitot tube*

3. *Servicing*

   Servicing dilakukan dengan cara membersihkan pitot tube dengan menggunakan *compressor* seperti pada gambar 4. 39, kemudian *engineer* memastikan *pitot line* terhubung ke *standby instrument airspeed indicator* dan *GDC* (*Garmin Data Computer*) seperti pada gambar 4. 40. Setelah dilakukan *cleaning* pada *pitot tube* ditemukan batu kecil seperti pada gambar 4. 41 yang menyebabkan tertutupnya *pitot* sehingga *pitot* tidak terbaca pada *standby instrument airspeed indicator* dan monitor *garmin*.

Gambar 4. 39 Membersihkan *pitot* menggunakan *compressor*

Gambar 4. 40 *Engineer* memastikan *pitot line* terhubung dengan *airspeed standby instrument*

Gambar 4. 41 Ditemukan batu kecil ketika selesai membersihkan *pitot* dengan *compressor*

4. *Installation*

   Setelah dilakukan *servicing* pada *pitot* kemudian *engineer* melakukan *installation* pada *pitot* dan memasang kembali *standby instrument* seperti pada gambar 4. 42.

Gambar 4. 42 *Installation pitot tube*

5. *Functional Test*

   Selanjutnya *engineer* melakukan *functional test* dengan mengarahkan peserta *OJT* meniup *pitot tube* tersebut dan hasilnya *pitot* bekerja dengan baik dengan melihat *standby instrument airspeed indicator* dan monitor *garmin* seperti pada gambar 4. 43

Gambar 4. 43 *Functional test* pada *pitot tube*

6. *Return to Service*

   Setelah *engineer* melakukan *functional test* dan hasil yang diperoleh adalah *standby instrument airspeed indicator* tersebut telah beroperasi dengan hasil penunjukan pada jarum *standby instrument airspeed indicator* bergerak, maka pesawat Cessna 172- S PK-BYL dinyatakan *return to service* dan dapat dioperasikan kembali.

4.6 *Inspection schedule maintenance*

Inspeksi *schedule maintenance* dilakukan bedasarkan jam terbang pada pesawat tersebut, inspeksi dibagi menjadi dua diantaranya: *50 hours inspection* dan *100 hours inspection*, berikut contoh kegiatan penulis saat *inspection schedule maintenance* selama di API Banyuwangi.

4.6.1 *50 Hours Inspection*

Pada tanggal 04 april 2024 dilakukan *schedule maintenance* yaitu *50 hours inspection* dengan pesawat PK-APK. Setelah mendapatkan perintah kerja / *task card* tersebut seperti pada lampiran 1 kemudian *engineer* dan peserta *OJT* menyiapkan *general tool box*. Ada beberapa kegiatan *50 hours inspection* yang dilakukan penulis dibawah pengawasan *engineer* diantaranya adalah: *flight control cable inspection, engine oil change, cleaning air filter dan, cleaning spark plug.*

1. *Removal*

   Pertama kali yang dilakukan adalah *removal* dengan melepas *fastener* pada *engine cowl* sesuai dengan referensi AMM *chapter* 71 menggunakan *tool phillip screw driver* serta membuka *panel flight control cable*.

2. *Inspection*

   Penulis melakukan inspeksi bersama seluruh *engineer shift* pagi. beberapa komponen yang diinspeksi seperti *flight control cable* dan *spark plug*. penulis menginspeksi *flight control cable* dengan majun guna memastikan apakah ada *wire* pada *flight control cable* terputus serta memastikan pergerakan *flight control* sesuai operation sesuai dengan referensi *AMM 05-20-01 page 5-6* seperti pada gambar 4. 44.

Gambar 4. 44 *Inspection flight control rudder cable*

3. *Servicing*

   Setelah melakukan inspeksi pada *flight control cable* dan *spark plug* kemudian dilakukan *servicing*, ada beberapa *servicing* yang dilakukan penulis diantaranya adalah: memberikan *lubricant pada pulley flight control* seperti pada gambar 4. 45, kemudian *engine oil change*, *clean spark plug*, *clean air filter*. *Engine oil change* adalah pergantian oil pada pesawat dengan cara membuka drain pada oil sump menggunakan wrench 3/4 seperti pada gambar 4. 46. *Engine oil change* dilakukan sesuai dengan AMM 12-14-02 page 301-303. Setelah *engine oil change* kemudian *refill oil* yang baru dengan *SAE J1966* dilakukan kemudian penulis melakukan *cleaning* pada *air filter* dengan *compressor* sesuai dengan referensi ata *chapter 12-*

15-00 page 301-303. Setelah itu penulis melakukan *cleaning* pada *spark plug* yang ditunjukan pada gambar 4. 47

Gambar 4. 45 *Lubrication* pada *pulley flight control*

Gambar 4. 46 *Engine oil change*

Gambar 4. 47 *Cleaning spark plug*

4. *installation*

   Setelah melakukan *servicing* kemudian penulis dan *engineer* melakukan *installation* dengan memasang *spark plug*, memasang *drain oil sump*, menutup semua *panel flight control cable*, dan memasang *air filter* serta memasang *spark plug* kembali.

5. *Functional test*

   Setelah *installation* dilakukan kemudian *engineer* dan penulis melakukan *functional test* dengan cara *engine ground run* seperti pada gambar 4. 48.

Gambar 4. 48 *Engine ground run after inspection 50* PK-APK.

6. *Return to Service*

   Setelah dilakukan *functional test* selanjutnya tahap akhir yaitu return to service, pada form RTS engineer mengatakan bahwa pesawat registrasi PK-APK telah dilakukan maintenance dan di inspeksi sesuai dengan approved maintenance program dan memenuhi persyaratan casr serta dinyatakan layak terbang seperti yang ditunjukan pada lampiran 1 halaman 96.

4.6.2 *100 Hours Inspection*

pada tanggal 7 mei 2024 dilakukan *schedule maintenance* yaitu 100 *hours inspection* pada pesawat PK-BYS. Kegiatan tersebut dilakukan setelah mendapatkan perintah kerja atau *task card* tersebut dari *engineering*. Kemudian *engineer* menyiapkan *general tool box* bersama peserta *OJT*. Kegiatan 100 *hours inspection* tidak jauh berbeda dari 50 *hours inspection*. Ada beberapa tambahan

pekerjaan yang harus dilakukan di dalam task card 100 *hours inspection* diantaranya: *inspection landing gear*, *fuel strainer* dan lain sebagainya.

1. *Removal*

   Pertama yang dilakukan adalah membuka *engine cowling* dengan *screwdriver philip* sesuai *AMM chapter 71*. Kemudian melepas *fuel strainer* dengan menggunakan *wrench 7/16* sesuai *AMM 28-20-00 page 220* seperti pada gambar4. 48. Setelah itu juga melepas *main wheel* dengan menggunakan beberapa tool seperti wrench 7/16 sesuai dengan *AMM 32-40-00 page 203* seperti pada gambar 4. 49.

Gambar 4. 49 *Removal fuel strainer*

Gambar 4. 50 *Removal main wheel*

2. *Inspection*

   Setelah melakukan *removal* kemudian melakukan inspeksi sesuai dengan 100 *hours inspection task card*. Dengan adanya inspeksi kita bisa memastikan apakah komponen tersebut masih layak atau tidak. Seperti pada gambar 4. 51 dan gambar 4. 52

Gambar 4. 51 *Inspection fuel strainer*

Gambar 4. 52 *Inspection main wheel*

3. *Servicing*

   Servicing dilakukan setelah tahap *inspection* yaitu memberi *lubrication* pada dan *main wheel* seperti pada gambar 4. 52

4. *Installation*

   Kemudian melakukan tahap ke empat yaitu *installation* yaitu memasang semua komponen yang sudah diinspeksi dan di *servicing* seperti pada gambar 4. 53.

Gambar 4. 53 *Intallation main wheel*

5. *Functional Test*

   Setelah melakukan *installation* kemudian *engineer* melakukan *functional test* dengan *engine ground run* guna untuk mengecek apakah *engine* sudah beroperasi dengan baik atau belum seperti pada gambar 4. 54

Gambar 4. 54 *Functional test*

6. *Return to Service*

   Setelah dilakukan *functional test* selanjutnya tahap akhir yaitu return to service, pada form RTS engineer mengatakan bahwa pesawat registrasi PK-BYS telah dilakukan maintenance dan di inspeksi sesuai dengan approved maintenance program dan memenuhi persyaratan CASR serta dinyatakan layak terbang seperti yang ditunjukan pada lampiran 2 halaman 126.

BAB V
PENUTUP

5.1 Kesimpulan

Kesimpulan adalah suatu pernyataan berdasarkan laporan yang telah dibuat oleh penulis berisi informasi atau data yang telah dikumpulkan. Kesimpulan bertujuan untuk memberikan pemahaman akhir tentang topik atau masalah yang telah diperoleh selama *OJT*. Menurut pedoman penulisan laporan *OJT* terbaru, kesimpulan dibagi menjadi dua bagian, kesimpulan tentang pelaksanaan *OJT* secara keseluruhan dan studi kasus yang disajikan. Kesimpulan yang dibahas dijelaskan pada sub bab 5.1.1 dan 5.1.2

5.1.1 Kesimpulan Terhadap Permasalahan *On The Job Training*

1. Berdasarkan uraian pada bab 4, dapat disimpulkan bahwa *troubleshoot* pada *vacuum pump* terjadi diakibatkan oleh aus-nya *brush* bahkan ada yang patah di dalam komponen *vacuum pump*. Ausnya *brush* disebabkan oleh umur penggunaan dan patahnya *brush* disebabkan karena acceleration terlalu mendadak pada saat starting serta pesawat melakukan *emergency go-around*, dari permasalahan tersebut engineer memutuskan untuk *replace*
2. Berdasarkan uraian pada bab 4,dengan judul *clean switch flap due to flaps fail to retract* dapat disimpulkan bahwa *troubleshoot* pada *flaps fail to retract*, diakibatkan *switch* yang menyambungkan *motor* ke *flap* kotor sehingga bisa menyebabkan *flaps* gagal untuk *retract* atau tidak merespon.
3. Bedasarkan uraian pada bab 4, dapat disimpulkan bahwa *troubleshoot* pada *magneto drop exceed* 150 disebabkan oleh *vibrate* pada *engine* ketika running sehingga menyebabkan gesernya *magneto* yang dapat merubah *timing engine* serta *drop* pada *magneto* lebih tinggi. Dari permasalahan tersebut *engineer* melakukan *engine timing external* sesuai dengan AMM 74-10-00
4. Bedasarkan uraian bab 4, dapat disimpulkan bahwa *troubleshoot* pada *magneto drop exceed* 150 Piper Seneca V disebabkan oleh *gap spark plug* yang hampir tertutupi oleh karbon dan terdapat *defect burn* pada *magneto*

kanan *engine* kiri yang disebabkan oleh filter yang kotor sehingga masuknya kotoran dan terbakar pada saat breaker poin terbuka.

5. Bedasarkan uraian bab 4 dapat disimpulkan bahwa *troubleshoot* pada sensor *CHT* dan *EGT engine* 2*burn* disebabkan oleh *vibrate* pada *engine* sehingga kabel tis sebagai penyangga sensor terputus dan *wire* yang menghubungkan sensor ke *GEA* 71 menempel pada *intake* dan *exhaust*
6. Bedasarkan uraian bab 4 dapat disimpulkan bahwa *servicing fuel shutoff valve control cable* pada pesawat PK-BYD tanggal 4 april 2024 disebabkan oleh pilot taruna yang menarik komponen tersebut terlalu kencang sehingga komponen tersebut putus.
7. Bedasarkan uraian bab 4 dapat disimpulkan bahwa *troubleshoot oil leak* disebabkan oleh *gasket* pada *rockerbox* telah aus sehingga menyebabkan *oil leak* pada pesawat PK-ARY tanggal 22 april 2024.
8. Bedasarkan uraian bab 4 dapat disimpulkan bahwa *servicing left main wheel* pada pesawat PK-BYS tanggal 25 juni 2024 disebabkan *hard landing* dan umur penggunaan pada komponen tersebut sehingga komponen tersebut mengalami *spot* atau aus.
9. Bedasarkan uraian bab 4 dapat disimpulkan bahwa *servicing pitot tube* pada pesawat PK-BYL tanggal 13 mei 2024 disebabkan oleh kotoran yang masuk ke *pitot tube* sehingga menyumbat dan tidak terbaca pada *airspeed stand by instrument* dan *display garmin*.

5.1.2 Kesimpulan Terhadap Pelaksanaan OJT

Berdasarkan kegiatan *On The Job Training* yang telah dilaksanakan dari tanggal 01 april 2024 sampai dengan 30 juni 2024, maka dapat diambil kesimpulan bahwa kegiatan *On The Job* sangatlah diperlukan untuk menunjang akademik sehingga dapat memberi manfaat dalam hal :

1. Kemampuan kerja

   Penulis dapat mengaplikasikan ilmu yang telah di pelajari di tempat pendidikan baik teori di kelas maupun praktek di hanggar
2. Disiplin dan tanggun jawab

Dengan adanya kegiatan ini penulis dapat menambah kedisiplinan, baik disiplin waktu untuk mematuhi aturan yang berlaku, maupun bertanggung jawab dari setiap tindakan maupun keputusan yang diambil.

3. Relasi

   Relasi dunia kerja atau penerbangan sangat lah penting, melalui kegiatan *OJT* tersebut penulis dapat menambah relasi dan memperoleh informasi terkait dunia kerja sehingga penulis dapat mempersiapkan diri lebih awal untuk rekrutmen pekerjaan yang akan dating.

5.2 Saran

5.2.1 Saran Terhadap Permasalahan On The Job Training

Pada saat inspeksi peserta OJT diharapkan mampu membaca serta memahami *taskcard* yang dibuat oleh *engineering* agar mempermudah untuk melakukan inspeksi atau *maintenance* pada pesawat. Jika mendapat *trouble* pada pesawat baik engineer yang menemukan sendiri atau medapatkan laporan *trouble* dari taruna penerbang selalu lakukan *troubleshoot* dan *maintenance* sesuai dengan referensi AMM serta memperhatikan *safety*.

Apabila melakukan *troubleshoot* pada komponen pesawat selain memahami *task card* dan memperhatikan *safety* juga harus memahami prinsip kerja pada komponen tersebut, kemudian lakukan inspeksi pada komponen dengan teliti guna untuk menemukan *defect* yang terjadi pada komponen seperti, *dent*, *crack, burning*, dll

5.2.2 Saran Terhadap Pelaksanaan On The Job Training

Adapun saran dari penulis untuk instansi Politeknik Penerbangan Surabaya dan kepada lokasi *OJT* hanggar API Banyuwangi.yakni sebagai berikut :

1. Kepada instansi Politeknik Penerbangan Surabaya agar dapat memberikan penambahan waktu *OJT* kepada para peserta *OJT* di hanggar API Banyuwangi karna dalam waktu 3 bulan masih dirasa kurang untuk menggali wawasan serta dengan kegiatan *OJT* penulis bisa berlatih hidup mandiri dan membiasakan hidup di perantauan.

2. Kepada taruna yang akan melaksanakan *OJT* di Banyuwangi diharapkan selalu mengutamakan keselamatan selama *OJT* selain itu gunakan waktu yang diberikan untuk lebih aktif dan inisiatif bertanya pada saat sedang *maintenance* atau senggang agar mendapatkan ilmu serta pengalaman yang bermanfaat untuk menunjang karir di masa yang akan datang.

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LAMPIRAN

Lampiran 1 *Task card* inspection 50 hours

KEMENTRIAN PERHUBUNGAN
BADAN PENGEMBANGAN SDM PERHUBUNGAN
AKADEMI PENERBANG INDONESIA BANYUWANGI
AMO 145D-1006

Aircraft Condition Assessment/ Pre maintenance Report

AIRCRAFT TYPE/SN :	CT4250/ A2541772	AIRCRAFT REG. :	PE-APK.
CUSTOMER :	API BWI	AIRFRAME HRS :	1952:32.
WORKORDER :			

This form is for use on projects following a receipt inspection of the aircraft. It is signed when completed by AMO-API representative and customer or customer representative

Forward Fuselage:

1. Spinner : Ok
2. Nose wheel well : Ok
3. Nose wheel tire : Ok
4. Windshield : Ok
5. Pitot/TAT probes : Ok
6. AOA Transducer : Ok
7. Static ports : Ok
8. Propeller : Ok
9. Antennas : Ok
10. Fuselage skin : Ok
11. Cabin windows : Ok

Aft Fuselage:

1. Engine cowlings : Ok
2. Engine Inlets : Ok
3. Antennas : Ok
4. Aft equipment Bay : Ok
5. Tail cone : Ok

Wings:

1. Landing /Taxi Lights : Ok
2. Leading Edge : Ok
3. Wing Tips : Ok
4. Static Wicks : Ok
5. Fuel Vents : Ok
6. Flaps/Ailerons : Ok
7. Fuel Cap/Panel : Ok
8. Main Wheel Strut : Ok
9. Main Wheel tire : Ok
10. Wing Skin : Ok

Empenage:

1. Vertical Stabilizer : Ok
2. Rudder : Ok
3. Horizontal Stabilizer : Ok
4. Elevators : Ok
5. Static Wicks : Ok
6. Tabs : Ok

Hidden Damage : N/A

Inspected by : Yoga ar-y
Date : 09/12/23

Signature
AMEL Number : 1040

FORM NO: 145D-1006-007 (November, 2022)

AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-1006

WORK ORDER

ORDER NUMBER	:				
A/C Type	: C172SP	A/C Serial	: 17281772	A/C Reg	: PK-APK-
A/C Total flying hours	: 1952:22				
Place	: API Bwi	Date completed	: 4/9/24		

Description of work :	ARC	V	Resolved		Additional Work Required
1. 50 Hours Inspection Check Cessna 172 Skyhawk.					
2.					
3.					
4.					
5.					

Mechanic	Engineer	Inspector
1. Ichael S.	1. Yoan an.y	1. S. Aji
2. Pandhita R.	2. Erpan F	2. Tayur H.
3. Hendrik F.S	3. Dimas	3. Yoji A.
4.		
5. Eko. P		
6.		
7.		
8.		
9.		
10.		

Tool & Equipment

Description	Qty	Validity
General tools	1	

AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

50 HOURS INSPECTION SHEET CESSNA 172 SKYHAWK

Due at	:		
Interval	:	A, L	
Insp. Operation	:	1, 13	
Type Inspection	:	Routine/Schedule	
Form No.	:	141-014-172S50	

Aircraft Registration	:	PK-APK	Aircraft Hours	:	1952:32
Aircraft Serial Number	:	172S11292	Engine Hours	:	1952:32
Date	:	4/9/2024	Propeller Hours	:	1694:50
Reference	:	Cessna 172S MM 5-12-01 Rev. 27 5-12-13 Rev. 27	Manual Revision	:	Rev. 27 15 Jan 2024

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
PRELIMINARY				
000000	Record anomalies into log book or equivalent document for corrective action.	000		
000000	Check aircraft compliance with airworthiness directives, service bulletins and service letters.	000		
000000	Check expiry date of life-limited parts : - Airframe - Equipment and hoses	000		
ATA 21 – AIR CONDITIONING				
214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	211		
214003	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	211		Inspection Operation 1
ATA 23 – COMMUNICATIONS				
231001	Communication Antennas and Cables - Inspect for security of attachment, connection, and condition.	210		Inspection Operation 3
235001	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.	211		Inspection Operation 1
235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, NAV/COM - Maintenance Practices.	222, 223		
ATA 24 – ELECTRICAL POWER				
242001	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120		
243003	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	210		Inspection Operation 1
246001	Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.	222		Inspection Operation 1

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 24 – ELECTRICAL POWER (Cont...)				
246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	222		
ATA 25 – EQUIPMENT/FURNISHINGS				
251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	211		
251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	211		
256001	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with CASR Part 91.207.	310		
ATA 26 – FIRE PROTECTION				
262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date.	230		
ATA 27 – FLIGHT CONTROLS				
271001	Aileron Controls - Check freedom of movement and proper operation through full travel.	120, 520, 620		
271002	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.	120, 520, 620		Inspection Operation 3
271003	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	520, 620		
271004	Ailerons and Hinges - Check condition, security, and operation.	520, 620		
271005	Control Wheel Lock - Check general condition and operation.	222		
271006	Control Yoke - Inspect pulleys, cables, bearings, and turnbuckles for condition and security.	222, 223		

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 27 – FLIGHT CONTROLS (Cont...)				
272001	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.	340		Inspection Operation 3
272002	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, nuts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	340		
272003	Rudder, Tips, Hinges, Stops, Clips and Cable Attachment - Check condition, security, and operation.	340		
272004	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.	230		Inspection Operation 1
272005	Rudder Control - Check freedom of movement and proper operation through full travel. Check rudder stops for damage and security.	340		
273001	Elevator Control - Check freedom of movement and proper operation through full travel.	222, 223		
273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	222, 223		
273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	320, 330		
273101	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	224, 240, 310		
273102	Elevator Trim Control and Indicator - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	224, 240, 310		Inspection Operation 1
273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	224		

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 27 – FLIGHT CONTROLS (Cont...)				
273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	320		
273106	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	240		Inspection Operation 1
275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	510, 610		
275002	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	221		Inspection Operation 1
275003	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	510, 610		Inspection Operation 3
275004	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	510, 610		Inspection Operation 3
275005	Flap Motor, Actuator, and Limit Switches - Check wiring and terminals for condition and security. Check actuator for condition and security.	610		Inspection Operation 3
275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12, Flight Controls - Servicing.	610		
ATA 28 – FUEL				
282001	Fuel System - Inspect plumbing and components for mounting and security.	510, 610		
282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	510, 610		
282003	Fuel Selector Valve - Check controls for detent in each position, security of attachment, and for proper placarding.	224		
282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	510, 610		Check quick drains for proper shut off.
282005	Fuel Reservoir - Using quick drain, ensure no contamination exists.	510, 610		
282006	Fuel Selector - Using quick drain, ensure no contamination exists.	224		

AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 28 – FUEL (Cont...)				
282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	510, 610		
ATA 31 – INDICATING/RECORDING SYSTEMS				
311001	Instruments - Check general condition and markings for legibility.	220		
311003	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	220		Inspection Operation 1
ATA 33 – LIGHTS				
331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	220, 211, 221		
334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	340, 520, 620		
ATA 34 – NAVIGATION				
341101	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	210		Inspection Operation 3
341103	Pitot Tube and Stall Warning System - Examine for condition and obstructions and make sure the anti-ice heat operates correctly. Apply vacuum to stall warning horn scoop assembly and make sure horn is audible.	510		
342101	Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.	225		Inspection Operation 1
345001	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, GPS, Transponder, and Compass System) - Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.	225		Inspection Operation 1
345002	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.	225		Inspection Operation 1
345003	Navigation Indicators, Controls, and Components - Inspect for condition and security.	220, 225		Inspection Operation 1
345004	Navigation Antennas and Cables - Inspect for security of attachment, connection, and condition.	310		Inspection Operation 1
ATA 52 – DOORS				
521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		Inspection Operation 1

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 52 – DOORS (Cont..)				
531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	210		
531003	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.	211		Inspection Operation 1
ATA 55 – STABILIZERS				
551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	320, 330		
551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	320, 330		
553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	340		
553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	340		
ATA 56 – WINDOWS				
561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		
ATA 57 – WINGS				
571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	510, 520, 610, 620		
571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	510, 610		
571003	Wing Access Plates - Check for damage and security of installation.	510, 520, 610, 620		Inspection Operation 3
571004	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.	510, 520, 610, 620		Inspection Operation 3

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 57 – WINGS (Cont...)				
571005	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	510, 520, 610, 620		Inspection Operation 3
ATA 61 – PROPELLERS				
611001	Spinner - Check general condition and attachment.	110		
611003	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110		
611005	Propeller Mounting - Check for security of installation.	110		
ATA 71 – POWERPLANTS				
711001	Cowling - Inspect for cracks, dents, other damage and security of fasteners.	120		New Revision Model 172 MM
712002	Do a check of the engine mount and the oil filler tube for evidence of contact. Refer to SB99-71-02.	120		New Revision Model 172 MM
716001	Alternate Induction Air System - Check for obstructions, operation, and security.	120		
716002	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	120		
716003	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.	120		
716004	Induction Air Filter - Remove and clean. Inspect for damage and service.	120		
722001	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120		
722003	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120		
723003	Engine Baffles and Seals - Check condition and security of attachment.	120		
ATA 76 – ENGINE CONTROLS				
761001	Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check to make sure the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel.	120, 225		The maximum linear freeplay is 0.050 inch.

AKADEMI PENERBANG INDONESIA
BANYUWANGI

MAINTENANCE PROGRAM
CESSNA 172 SKYHAWK

APPENDIX

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 78 – EXHAUST				
781001	Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120		
ATA 79 – OIL				
791001	Engine Oil – Drain oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug and on engine suction screen. Replace filter, and refill with recommended grade aviation oil	120		They are complete every 50 hours or 4 (four) months, whichever occurs first.
792001	Oil Cooler - Check for obstructions, leaks, and security of attachment.	120		
ATA 80 – STARTING				
801002	Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120		
FINAL STEP				
000000	Perform a test run-up. Record parameters (at engine shutdown).	000		
000000	After the test run-up, remove upper and lower engine cowlings and check for leaks (oil, fuel, air, exhaust gases). If everything is normal, reinstall the engine cowlings and check that they are correctly locked.	000		
000000	Record this inspection in the aircraft maintenance files (airframe, engine and propeller log books).	000		
	End of 50 Hours Inspection Sheet			

Component Replacement Record

No.	Description	S/N OFF	S/N ON	Sign

Inspection Result :

Corrective Action :

AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

Return to Service

I hereby certify that aircraft PK - ..KPL..... has been maintained and inspected in accordance with the Cessna 172S Approved Maintenance Program and met requirements with applicable of Civil Aviation Safety Regulation and is determined to be airworthy condition.

Issued at : Ad Bwi ..... Date : 04/04/29

Amel No. : 1029 ..... Signature : .....

Lampiran 2 Task card inspection 100 hours

AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-1006

WORK ORDER

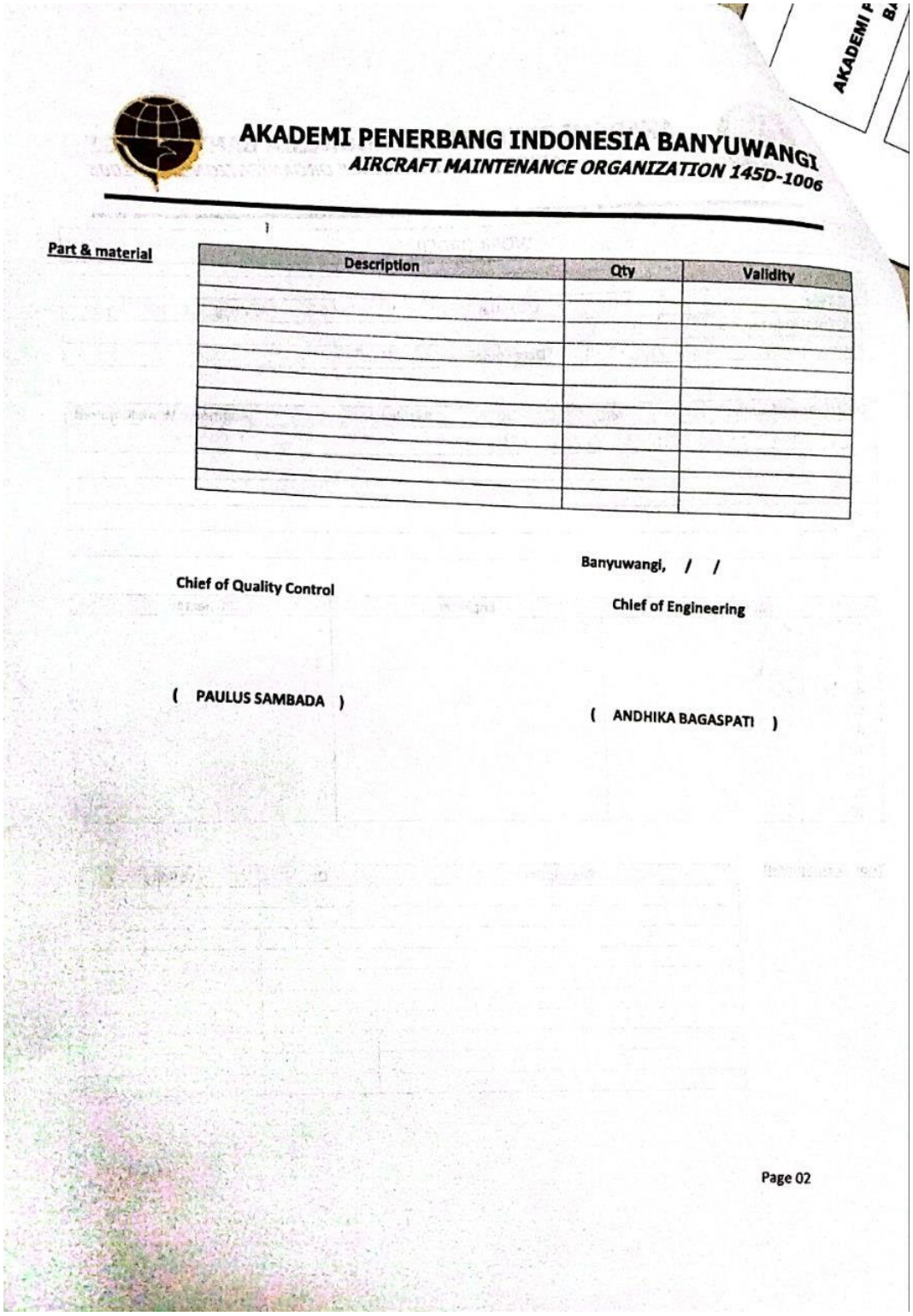
ORDER NUMBER	:				
A/C Type	: C172S	A/C Serial	: 172S11709	A/C Reg	: pk- BYS
A/C Total flying hours	: 1097:15				
Place	: API BWI	Date completed	: 7 Mei 2024		

Description of work :	ARC	Resolved	Additional Work Required
1. Temporary Storage Return to service Cessna 172 Skyhawk			
2.			
3.			
4.			
5.			

Mechanic	Engineer	Inspector
1. Eko P.	1. Erfan	1. Yosi A.
2. Fadzilah	2. Maredha	2. Fayar A.
3. Hendrik	3. Dimas	
4. Ichsan	4. Azi S.	
5.	5. Yoren	
6.		
7.		
8.		
9.		
10.		

Tool & Equipment

Description	Qty	Validity



AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-1006

Part & material

Description	Qty	Validity

Banyuwangi, / /

Chief of Quality Control

(PAULUS SAMBADA)

Chief of Engineering

(ANDHIKA BAGASPATI)

Page 02

AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

TEMPORARY STORAGE RETURN TO SERVICE CESSNA 172 SKYHAWKS	141-014-172S-TRTS

Aircraft Registration : PK - BYS
Aircraft Serial Number : 172S11709
Date :
Reference : Cessna 172S MM 10-30-00 Rev. 27

Aircraft Hours : 1097:15
Engine Hours : 1097:15
Propeller Hours : 1097:15
Manual Revision : Rev. 27 15 Jan 2024

Temporary storage is defined as airplane in a nonoperational status for a maximum of 90 days. After temporary storage, use the following procedures to return the airplane to service:

ITEM CODE NUMBER	TASK	ENGINEER SIGN	REMARKS
1	Remove airplane from blocks and check tires for proper inflation. Check for proper nose gear strut inflation.		
2	Check battery and install.		
3	Check that oil sump has proper grade and quantity of engine oil.		
4	Service induction air filter and remove warning placard from propeller.		
5	Remove materials used to cover openings.		
6	Remove spark plugs from engine.		
7	While spark plugs are removed, rotate propeller several revolutions to clear excess oil from cylinders.		
8	Clean, gap and install spark plugs. Torque spark plugs to the proper value and connect spark plug leads.		
9	Check fuel strainer. Remove and clean filter screen if necessary. Check fuel tanks and fuel lines for moisture and sediment. Drain enough fuel to eliminate any moisture and sediment.		
10	Perform a thorough preflight inspection, then start and warm up engine.		

"End of Temporary Storage Return To Service"

Component Replacement Record

No.	Description	S/N OFF	S/N ON	Sign

AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

Inspection Result :

OK

Corrective Action :

N/A

Return to Service

I hereby certify that aircraft PK - ..... has been maintained and inspected in accordance with the Cessna 172S Approved Maintenance Program and met requirements with applicable of Civil Aviation Safety Regulation and is determined to be airworthy condition.

Issued at : API BWX ..... Date : .....

Amel No. : 10246 ..... Signature : .....

KEMENTRIAN PERHUBUNGAN
BADAN PENGEMBANGAN SDM PERHUBUNGAN
AKADEMI PENERBANG INDONESIA BANYUWANGI
AMO 145D-1006

Aircraft Condition Assessment/ Pre maintenance Report

AIRCRAFT TYPE/SN :		AIRCRAFT REG. :	
CUSTOMER :		AIRFRAME HRS :	
WORKORDER :			

This form is for use on projects following a receipt inspection of the aircraft. It is signed when completed by AMO-API representative and customer or customer representative

Forward Fuselage:

1. Spinner : OK
2. Nose wheel well : OK
3. Nose wheel tire : OK
4. Windshield : OK
5. Pitot/TAT probes : OK
6. AOA Transducer : OK
7. Static ports : OK
8. Propeller : OK
9. Antennas : OK
10. Fuselage skin : OK
11. Cabin windows : OK

Aft Fuselage:

1. Engine cowlings : OK
2. Engine Inlets : OK
3. Antennas : OK
4. Aft equipment Bay : OK
5. Tail cone : OK

Wings:

1. Landing /Taxi Lights : OK
2. Leading Edge : OK
3. Wing Tips : OK
4. Static Wicks : OK
5. Fuel Vents : OK
6. Flaps/Ailerons : OK
7. Fuel Cap/Panel : OK
8. Main Wheel Strut : OK
9. Main Wheel tire : OK
10. Wing Skin : OK

Empenage:

1. Vertical Stabilizer : OK
2. Rudder : OK
3. Horizontal Stabilizer : OK
4. Elevators : OK
5. Static Wicks : OK
6. Tabs : OK

Hidden Damage : N/A

Inspected by : M404106 - P
Date : 07/05/2024

Signature : [signature]
AMEL Number : 10216

FORM NO: 145D-1006-007 (November, 2022)

AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-1006

WORK ORDER

ORDER NUMBER	:						
A/C Type	:	C172S	A/C Serial	:	172S11709	A/C Reg	: PK-BYS
A/C Total flying hours	:	1097:15					
Place	:	Agi BWI	Date completed	:	7 Mei 2024		

Description of work :	☐ ARC	☐ Resolved	☐ Additional Work Required
1. 100 Hours Inspection Sheet Cessna 172 Skyhawk			
2.			
3.			
4.			
5.			

Mechanic	Engineer	Inspector
1. Eko P.	1. Erfan	1. Yogi
2. Fadzila	2. Macdha	2. fajar M.
3. Ickbal	3. Dimas	
4. Hendrik	4. Yoseva	
5.	5. Agi S.	
6.		
7.		
8.		
9.		
10.		

Tool & Equipment

Description	Qty	Validity

AKADEMI PENERBANG INDONESIA BANYUWA
AIRCRAFT MAINTENANCE ORGANIZATION 145D-10

AKADEMI PENE BANYU

100 HOUR C

Part & material

Description	Qty	Validity

Banyuwangi, / /

Chief of Quality Control

(PAULUS SAMBADA)

Chief of Engineering

(ANDHIKA BAGASPATI)

AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

100 HOURS INSPECTION SHEET CESSNA 172 SKYHAWK

Due at	:		
Interval	:	A, B, L, U, V	
Insp. Operation	:	1, 2, 13, 22, 23	
Type Inspection	:	Routine/Schedule	
Form No.	:	141-014-172S100	

Aircraft Registration	:	PK-BYS	Aircraft Hours	:	1079:13
Aircraft Serial Number	:	172S11705	Engine Hours	:	1875:15
Date	:	7 Mei 2024	Propeller Hours	:	1079:15
Reference	:	Cessna 172S MM	Manual Revision	:	Rev. 27
					15 Jan 2024

5-12-01 Rev. 27 5-12-13 Rev. 27
5-12-02 Rev. 27 5-12-22 Rev. 27
5-12-03 Rev. 27 5-12-23 Rev. 27

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
PRELIMINARY				
000000	Record anomalies into log book or equivalent document for corrective action.	000		
000000	Check aircraft compliance with airworthiness directives, service bulletins and service letters.	000		
000000	Check expiry date of life-limited parts : - Airframe - Equipment and hoses	000		
ATA 21 – AIR CONDITIONING				
212002	Primary Flight Display (PFD) Fan adn Multi-Function Flight Display (MFD) Fan, Deck Skin Fan, and Remote Avionics Cooling Fan – Operational check. Refer to Chapter 21, Avionics Cooling – Maintenance Practices.	220, 225		Every 1 Year
214001	Cold and Hot Air Hoses - Check condition, routing, and security.	120		
214002	Heater Components, Inlets, and Outlets - Inspect all lines, ducts, clamps, seals, and gaskets for condition, restriction, and security.	211		
214003	Cabin Heat and Ventilation Controls - Check freedom of movement through full travel. Check friction locks for proper operation.	211		Inspection Operation 1
ATA 23 – COMMUNICATIONS				
231001	Communication Antennas and Cables - Inspect for security of attachment, connection, and condition.	210		Inspection Operation 3
235001	Microphones, Headsets, and Jacks - Inspect for cleanliness, security, and evidence of damage.	211		Inspection Operation 1
235002	Microphone Push-To-Talk Switch - Clean the pilot's and copilot's microphone switches. Refer to Chapter 23, NAV/COM - Maintenance Practices.	222, 223		
ATA 24 – ELECTRICAL POWER				
242001	Alternator, Mounting Bracket, and Electrical Connections - Check condition and security. Check alternator belts for condition and proper adjustment. Check belt tension.	120		

AKADEMI PENERBANG INDONESIA
BANYUWANGI

MAINTENANCE PROG
CESSNA 172 SKYHAW

APPENDIX

AKADEMI PE
BA

ITEM CODE NUMBER
TA 26 – FIR

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 24 – ELECTRICAL (Cont...)				
243001	Main Battery - Examine the general condition and security. Complete the applicable main battery servicing procedure. Refer to Chapter 12, Battery - Servicing.	120		New Revision Model 172 MM
243002	Main Battery Box and Cables - Clean and remove any corrosion. Examine the cables for routing, support, and security of the connections. Refer to Chapter 12, Main Battery Servicing	120		New Revision Model 172 MM
243003	General Airplane and System Wiring - Inspect for proper routing, chafing, broken or loose terminals, general condition, broken or inadequate clamps, and sharp bends in wiring.	210		Inspection Operation 1
243004	External Power Receptacle and Power Cables - Inspect for condition and security.	120		
246001	Switch and Circuit Breaker Panel, Terminal Blocks, and Junction Boxes - Inspect wiring and terminals for condition and security.	222		Inspection Operation 1
246002	Power Junction Box - Check operation and condition. Check availability and condition of spare fuse (if applicable).	222		
ATA 25 – EQUIPMENT/FURNISHINGS				
251001	Seats - Examine the seats to make sure they are serviceable and installed correctly. Make sure the seat stops and adjustment mechanism operate correctly. Examine the seat recline control and attaching hardware to make sure the hardware and lock are not damaged and are correctly installed. Lubricate the threads of the Seat Crank Handle Assembly with MIL-PRF-81322 general purpose grease.	211		
251002	Seat Tracks and Stops - Inspect seat tracks for condition and security of installation. Check seat track stops for damage and correct location. Inspect seat rails for cracks.	230		
251101	Restraint System, front and rear - Check belts for thinning, fraying, cutting, broken stitches, or ultra-violet deterioration. Check system hardware for security of installation.	211		
256001	Emergency Locator Transmitter - Inspect for security of attachment and check operation by verifying transmitter output. Check cumulative time and useful life of batteries in accordance with CASR Part 91.207.	310		

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
TA 26 – FIRE PROTECTION				
262001	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition, security of installation, and servicing date. (Applicable to Halon and Non-Halon Fire Extinguishers)	230		
ATA 27 – FLIGHT CONTROLS				
271001	Aileron Controls - Check freedom of movement and proper operation through full travel.	120, 520, 620		
271002	Ailerons and Cables - Check operation and security of stops. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety. Check travel If cable tension requires adjustment or if stops are damaged. Check fairleads and rub strips for condition.	120, 520, 620		Inspection Operation 3
271003	Aileron Structure, Control Rods, Hinges, Balance Weights, Bellcranks, Linkage, Bolts, Pulleys, and Pulley Brackets - Check condition, operation, and security of attachment.	520, 620		
271004	Ailerons and Hinges - Check condition, security, and operation.	520, 620		
271005	Control Wheel Lock - Check general condition and operation.	222		
271006	Control Yoke - Inspect pulleys, cables, bearings, and turnbuckles for condition and security.	222, 223		
272001	Rudder - Check internal surfaces for corrosion, condition of fasteners, and balance weight attachment.	340		Inspection Operation 3
272002	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, nuts, hinge bearings, hinge attach fittings, and bonding jumper for evidence of damage and wear, failed fasteners, and security. Inspect balance weight for looseness and the supporting structure for damage.	340		
272003	Rudder, Tips, Hinges, Stops, Clips and Cable Attachment - Check condition, security, and operation.	340		
272004	Rudder Pedals and Linkage - Check for general condition, proper rigging, and operation. Check for security of attachment.	230		Inspection Operation 1
272005	Rudder Control - Check freedom of movement and proper operation through full travel. Check rudder stops for damage and security.	340		
273001	Elevator Control - Check freedom of movement and proper operation through full travel.	222, 223		
273002	Elevator Control System - Inspect pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition, security, and operation. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	222, 223		

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 27 – FLIGHT (Cont...)				
273003	Elevator, Hinges, Stops, and Cable Attachment - Check condition, security, and operation.	320, 330		
273101	Elevator Trim System - Check cables, push-pull rods, bellcranks, pulleys, turnbuckles, fairleads, rub strips, etc. for proper routing, condition, and security.	224, 240, 310		
273102	Elevator Trim Control and Indicator - Check freedom of movement and proper operation through full travel. Check pulleys, cables, sprockets, bearings, chains, and turnbuckles for condition and security. Check cables for tension, routing, fraying, corrosion, and turnbuckle safety.	224, 240, 310		Inspection Operation 1
273103	Elevator Trim Tab and Hinges - Check condition, security, and operation.	224		
273104	Elevator Trim Tab Actuator - Examine the free play limits. Refer to Chapter 27, Elevator Trim Control - Maintenance Practices, Trim Tab Free Play Inspection. If the free play is more than the permitted limits, lubricate the actuator and examine the free play limits again. If the free play is still more than the permitted limits, replace the actuator.	320		
273106	Elevator Trim Tab Stop Blocks - Inspect for damage and security.	240		Inspection Operation 1
275001	Flaps - Check tracks, rollers, and control rods for security of attachment. Check rod end bearings for corrosion. Check operation.	510, 610		
275002	Wing Flap Control - Check operation through full travel and observe Flap Position indicator for proper indication.	221		Inspection Operation 1
275003	Flap Structure, Linkage, Bellcranks, Pulleys, and Pulley Brackets - Check for condition, operation and security.	510, 610		Inspection Operation 3
275004	Flaps and Cables - Check cables for proper tension, routing, fraying, corrosion, and turnbuckle safety. Check travel if cable tension requires adjustment.	510, 610		Inspection Operation 3
275005	Flap Motor, Actuator, and Limit Switches - Check wiring and terminals for condition and security. Check actuator for condition and security.	610		Inspection Operation 3
275006	Flap Actuator Threads - Clean and lubricate. Refer to Chapter 12, Flight Controls - Servicing.	610		
ATA 28 – FUEL				
282001	Fuel System - Inspect plumbing and components for mounting and security.	510, 610		
282002	Fuel Tank Vent Lines and Vent Valves - Check vents for obstruction and proper positioning. Check valves for operation.	510, 610		
282003	Fuel Selector Valve - Check controls for detent in each position, security of attachment, and for proper placarding.	224		

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 28 – FUEL (Cont...)				
282004	Integral Fuel Bays - Check for evidence of leakage and condition of fuel caps, adapters, and placards. Using quick drains, ensure no contamination exists. Check quick drains for proper shut off.	510, 610		Check quick drains for proper shut off.
282005	Fuel Reservoir - Using quick drain, ensure no contamination exists.	510, 610		
282006	Fuel Selector - Using quick drain, ensure no contamination exists.	224		
282007	Fuel Strainer, Drain Valve, and Controls - Check freedom of movement, security, and proper operation. Disassemble, flush, and clean screen and bowl.	510, 610		
282010	Auxiliary (Electric) Fuel Pump - Check pump and fittings for condition, operation, security.	120		
ATA 31 – INDICATING/RECORDING SYSTEMS				
311001	Instruments - Check general condition and markings for legibility.	220		
311003	Instrument Lines, Fittings, Ducting, and Instrument Panel Wiring - Check for proper routing, support, and security of attachment.	220		Inspection Operation 1
ATA 32 – LANDING GEAR				
321001	Main Landing Gear Wheel Fairings, Strut Fairings, and Cuffs - Check for cracks, dents, condition of paint, and correct scraper clearance.	721, 722		
321002	Main Gear Spring Assemblies - Examine for cracks, dents, corrosion, condition of paint or other damage. Examine for chips, scratches, or other damage that lets corrosion get to the steel spring. Examine the axles for condition and security.	721, 722		
321003	Main Landing Gear Attachment Structure - Check for damage, cracks, loose rivets, bolts and nuts and security of attachment.	721, 722		
322001	Nose Gear - Inspect torque links, steering rods, and boots for condition and security of attachment. Check strut for evidence of leakage and proper extension. Check strut barrel for corrosion, pitting, and cleanliness. Check shimmy damper and/or bungees for operation, leakage, and attach points for wear and security.	720		
322002	Nose Landing Gear Wheel Fairings - Check for cracks, dents, and condition of paint.	720		

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 32 – LANDING (Cont...)				
322004	Nose Gear Attachment Structure - Inspect for cracks, corrosion, or other damage and security of attachment.	720		
324001	Brakes - Test toe brakes and parking brake for proper operation.	230		
324002	Brakes, Master Cylinders, and Parking Brake - Check master cylinders and parking brake mechanism for condition and security. Check fluid level and test operation of toe and parking brake. Refer to Chapter 12, Hydraulic Brakes - Servicing.	224, 230		Inspection Operation 4
324004	Tires - Check tread wear and general condition. Check for proper inflation.	720, 721, 722		
324005	Wheels, Brake Discs, and Linings - Inspect for wear, cracks, warps, dents, or other damage. Check wheel through-bolts and nuts for looseness.	721, 722		
324006	Wheel Bearings - Clean, inspect and lube.	720, 721, 722		Inspection Operation 4
325001	Nose Gear Steering Mechanism - Check for wear, security, and proper rigging.	720		Inspection Operation 4
ATA 33 – LIGHTS				
331001	Instrument and Cabin Lights - Check operation, condition of lens, and security of attachment.	220, 211, 221		
334001	Navigation, Beacon, Strobe, and Landing Lights - Check operation, condition of lens, and security of attachment.	340, 520, 620		
ATA 34 – NAVIGATION				
341101	Static System - Inspect for security of installation, cleanliness, and evidence of damage.	210		Inspection Operation 3
341103	Pitot Tube and Stall Warning System - Examine for condition and obstructions and make sure the anti-ice heat operates correctly. Apply vacuum to stall warning horn scoop assembly and make sure horn is audible.	510		
342101	Magnetic Compass - Inspect for security of installation, cleanliness, and evidence of damage.	225		Inspection Operation 1
345001	Instrument Panel Mounted Avionics Units (Including Audio Panel, VHF Nav/Com(s), ADF, GPS, Transponder, and Compass System) - Inspect for deterioration, cracks, and security of instrument panel mounts. Inspect for security of electrical connections, condition, and security of wire routing.	225		Inspection Operation 1

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ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 34 – NAVIGATION (Cont...)				
345002	Avionics Operating Controls - Inspect for security and proper operation of controls and switches and ensure that all digital segments will illuminate properly.	225		Inspection Operation 1
345003	Navigation Indicators, Controls, and Components - Inspect for condition and security.	220, 225		Inspection Operation 1
345004	Navigation Antennas and Cables - Inspect for security of attachment, connection, and condition.	310		Inspection Operation 1
ATA 37 – VACUUM				
371001	Vacuum System - Inspect for condition and security.	120		
371002	Vacuum Pumps - Check for condition and security. Check vacuum system breather line for obstructions, condition, and security.	120		
371003	Vacuum System Hoses - Inspect for hardness, deterioration, looseness, or collapsed hoses.	120		
371004	Gyro Filter - Inspect for damage, deterioration and contamination. Clean or replace if required.	120		
ATA 52 – DOORS				
521001	Doors - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		Inspection Operation 1
531001	Fuselage Surface - Inspect for skin damage, loose rivets, condition of paint, and check pitot-static ports and drain holes for obstruction. Inspect covers and fairings for security.	210		
531002	Firewall Structure - Inspect for wrinkles, damage, cracks, sheared rivets, etc. Check cowl shock mounts for condition and security.	120		
531003	Internal Fuselage Structure - Inspect bulkheads, doorposts, stringers, doublers, and skins for corrosion, cracks, buckles, and loose rivets, bolts and nuts.	211		Inspection Operation 1
ATA 55 – STABILIZERS				
551001	Horizontal Stabilizer and Tailcone structure - Inspect bulkheads, spars, ribs, and skins, for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect horizontal stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tips.	320, 330		
551002	Horizontal Stabilizer and Tips - Inspect externally for skin damage and condition of paint.	320, 330		
553001	Vertical Stabilizer Fin - Inspect bulkheads, spars, ribs, and skins for cracks, wrinkles, loose rivets, corrosion, or other damage. Inspect vertical stabilizer attach bolts for looseness. Retorque as necessary. Check security of inspection covers, fairings, and tip.	340		
553002	Vertical Stabilizer Fin and Tailcone - Inspect externally for skin damage and condition of paint.	340		

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 56 – WINDOWS				
561001	Windows and Windshield - Inspect general condition. Check latches, hinges, and seals for condition, operation, and security of attachment.	210		
ATA 57 – WINGS				
571001	Wing Surfaces and Tips - Inspect for skin damage, loose rivets, and condition of paint.	510, 520, 610, 620		
571002	Wing Struts and Strut Fairings - Check for dents, cracks, loose screws and rivets, and condition of paint.	510, 610		
571003	Wing Access Plates - Check for damage and security of installation.	510, 520, 610, 620		Inspection Operation 3
571004	Wing Spar and Wing Strut Fittings - Check for evidence of wear. Check attach bolts for indications of looseness and retorque as required.	510, 520, 610, 620		Inspection Operation 3
571005	Wing Structure - Inspect spars, ribs, skins, and stringers for cracks, wrinkles, loose rivets, corrosion, or other damage.	510, 520, 610, 620		Inspection Operation 3
ATA 61 – PROPELLERS				
611001	Spinner - Check general condition and attachment.	110		
611002	Spinner, spinner bulkhead, and engine crankshaft expansion plug – remove spinner, wash, and inspect for cracks and fractures. While spinner is removed, check expansion plug and area for evidence of leakage, security of attachment, and general condition.	110		
611003	Propeller Blades - Inspect for cracks, dents, nicks, scratches, erosion, corrosion, or other damage.	110		
611004	Propeller Hub - Check general condition.	110		
611005	Propeller Mounting - Check for security of installation.	110		
611006	Propeller Mounting Bolts - Inspect mounting bolts and safety wire for signs of looseness. Retorque mounting bolts as required.	110		
ATA 71 – POWERPLANT				
711001	Cowling - Inspect for cracks, dents, other damage and security of fasteners.	120		New Revision Model 172 MM
712001	Engine Shock Mounts, Engine Mount Structure, and Ground Straps - Check condition, security, and alignment.	120		
712002	Do a check of the engine mount and the oil filler tube for evidence of contact. Refer to SB99-71-02.	120		New Revision Model 172 MM
716001	Alternate Induction Air System - Check for obstructions, operation, and security.	120		

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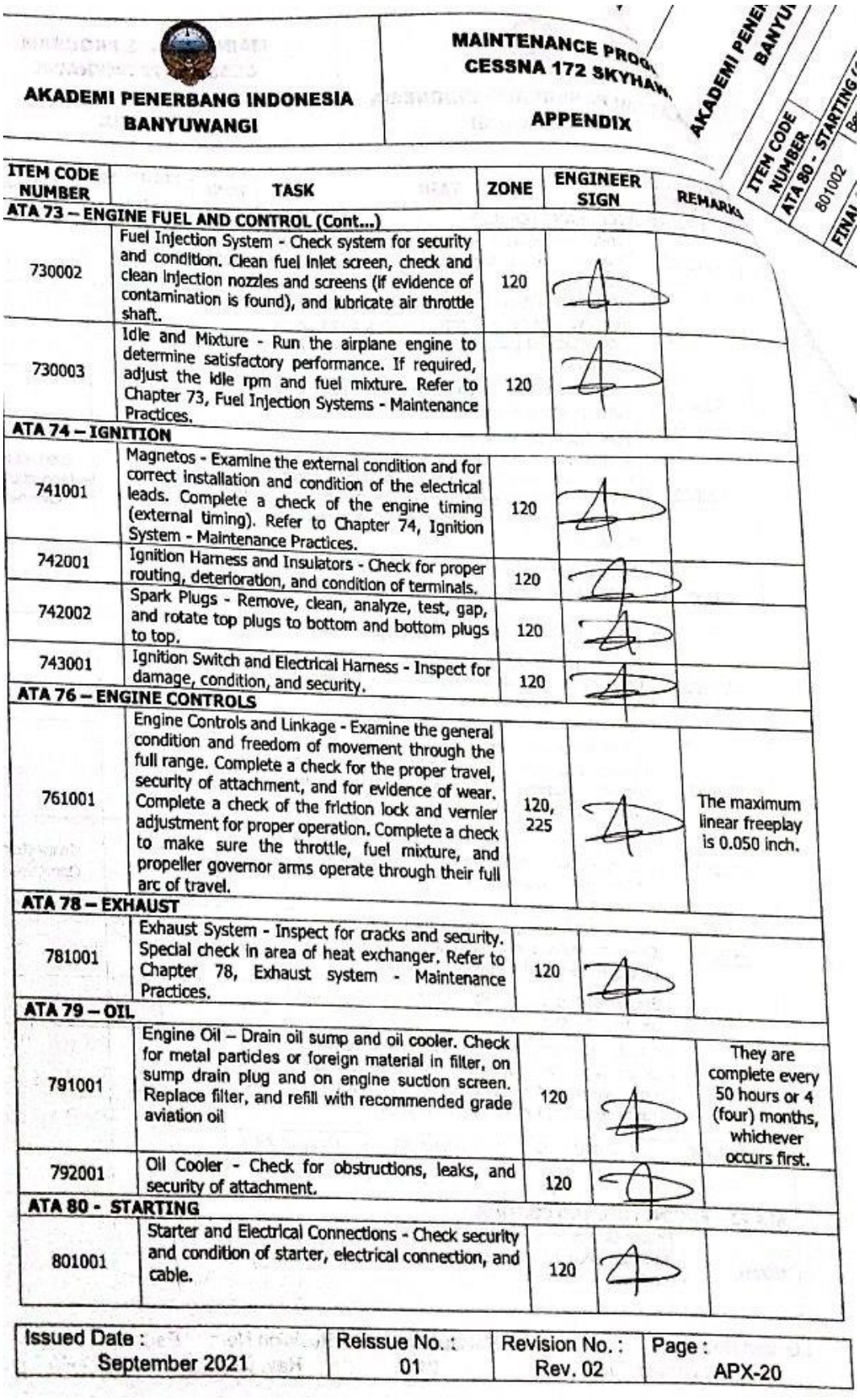
ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 71 – POWERPLANT (Cont...)				
716002	Induction System - Check security of clamps, tubes, and ducting. Inspect for evidence of leakage.	120		
716003	Induction Airbox, Valves, Doors, and Controls - Remove air filter and inspect hinges, doors, seals, and attaching parts for wear and security. Check operation.	120		
716004	Induction Air Filter - Remove and clean. Inspect for damage and service.	120		
720000	Fuel line (Stainless Steel Tube Assembly) and support clamp inspection and installation. Refer to Lycoming Service Bulletin Number 342E or Later. NOTE : Completed every annual, overhaul, and any time fuel lines or clamps are serviced, removed, or replaced.	120		Every Annual Inspection or Overhaul
722001	Engine - Inspect for evidence of oil and fuel leaks. Wash engine and check for security of accessories.	120		
722002	Crankcase, Oil Sump, and Accessory Section - Inspect for cracks and evidence of oil leakage. Check bolts and nuts for looseness and retorque as necessary. Check crankcase breather lines for obstructions, security, and general condition.	120		
722003	Hoses, Metal Lines, and Fittings - Inspect for signs of oil and fuel leaks. Check for abrasions, chafing, security, proper routing and support and for evidence of deterioration.	120		
723001	Engine Cylinders, Rocker Box Covers, and Pushrod Housings - Check for fin damage, cracks, oil leakage, security of attachment, and general condition.	120		Inspection Operation 4
723002	Engine Metal Lines, Hoses, Clamps, and Fittings - Check for leaks, condition, and security. Check for proper routing and support.	120		
723003	Engine Baffles and Seals - Check condition and security of attachment.	120		
723004	Cylinder Compression - Complete a differential compression test. If there is weak cylinder compression, refer to Chapter 71, Engine - Troubleshooting, for further procedures.	120		
Cylinder #1	Cylinder #2	Cylinder #3	Cylinder #4	
75	70	70	75	
ATA 73 – ENGINE FUEL AND CONTROL				
730001	Engine-Driven Fuel Pump - Check for evidence of leakage, security of attachment, and general condition.	120		



AKADEMI PENERBANG INDONESIA
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ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 73 – ENGINE FUEL AND CONTROL (Cont...)				
730002	Fuel Injection System - Check system for security and condition. Clean fuel inlet screen, check and clean injection nozzles and screens (if evidence of contamination is found), and lubricate air throttle shaft.	120		
730003	Idle and Mixture - Run the airplane engine to determine satisfactory performance. If required, adjust the idle rpm and fuel mixture. Refer to Chapter 73, Fuel Injection Systems - Maintenance Practices.	120		
ATA 74 – IGNITION				
741001	Magnetos - Examine the external condition and for correct installation and condition of the electrical leads. Complete a check of the engine timing (external timing). Refer to Chapter 74, Ignition System - Maintenance Practices.	120		
742001	Ignition Harness and Insulators - Check for proper routing, deterioration, and condition of terminals.	120		
742002	Spark Plugs - Remove, clean, analyze, test, gap, and rotate top plugs to bottom and bottom plugs to top.	120		
743001	Ignition Switch and Electrical Harness - Inspect for damage, condition, and security.	120		
ATA 76 – ENGINE CONTROLS				
761001	Engine Controls and Linkage - Examine the general condition and freedom of movement through the full range. Complete a check for the proper travel, security of attachment, and for evidence of wear. Complete a check of the friction lock and vernier adjustment for proper operation. Complete a check to make sure the throttle, fuel mixture, and propeller governor arms operate through their full arc of travel.	120, 225		The maximum linear freeplay is 0.050 inch.
ATA 78 – EXHAUST				
781001	Exhaust System - Inspect for cracks and security. Special check in area of heat exchanger. Refer to Chapter 78, Exhaust system - Maintenance Practices.	120		
ATA 79 – OIL				
791001	Engine Oil – Drain oil sump and oil cooler. Check for metal particles or foreign material in filter, on sump drain plug and on engine suction screen. Replace filter, and refill with recommended grade aviation oil	120		They are complete every 50 hours or 4 (four) months, whichever occurs first.
792001	Oil Cooler - Check for obstructions, leaks, and security of attachment.	120		
ATA 80 - STARTING				
801001	Starter and Electrical Connections - Check security and condition of starter, electrical connection, and cable.	120		

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ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
ATA 80 - STARTING (Cont...)				
801002	Bendix Drive Starter Assembly - Clean and lubricate starter drive assembly.	120		
FINAL STEP				
000000	Perform a test run-up. Record parameters (at engine shutdown).	000		
000000	After the test run-up, remove upper and lower engine cowlings and check for leaks (oil, fuel, air, exhaust gases). If everything is normal, reinstall the engine cowlings and check that they are correctly locked.	000		
000000	Record this inspection in the aircraft maintenance files (airframe, engine and propeller log books).	000		
End of 100 Hours Inspection Sheet				

Component Replacement Record

No.	Description	S/N OFF	S/N ON	Sign

Inspection Result :

Ok

Corrective Action :

N/A

Return to Service

I hereby certify that aircraft PK - ..... has been maintained and inspected in accordance with the Cessna 172S Approved Maintenance Program and met requirements with applicable of Civil Aviation Safety Regulation and is determined to be airworthy condition.

Issued at : Api Bwi ..... Date : 07/05/2024

Amel No. : 10246 ..... Signature : .....

AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-1006

WORK ORDER

ORDER NUMBER	:						
A/C Type	:	C172S	A/C Serial	:	172S11705	A/C Reg	: PK-BYS
A/C Total flying hours	:	1079:15					
Place	:	HPI BWI	Date completed	:	9 mei 2024		

Description of work :	☐ ARC	☐ Resolved	☐ Additional Work Required
1. 100 Hours Inspection Sheet Lycoming Engine IO-360-L2A			
2.			
3.			
4.			
5.			

Mechanic	Engineer	Inspector
1. Eko P.	1. Erfan	1. Yogi A.
2. fadzila	2. Yoiva	2. Fajar H.
3. Hendrik	3. Maedhan	
4. Ickbal	4. Dimas	
5.	5. Aji	
6.		
7.		
8.		
9.		
10.		

Tool & Equipment

Description	Qty	Validity

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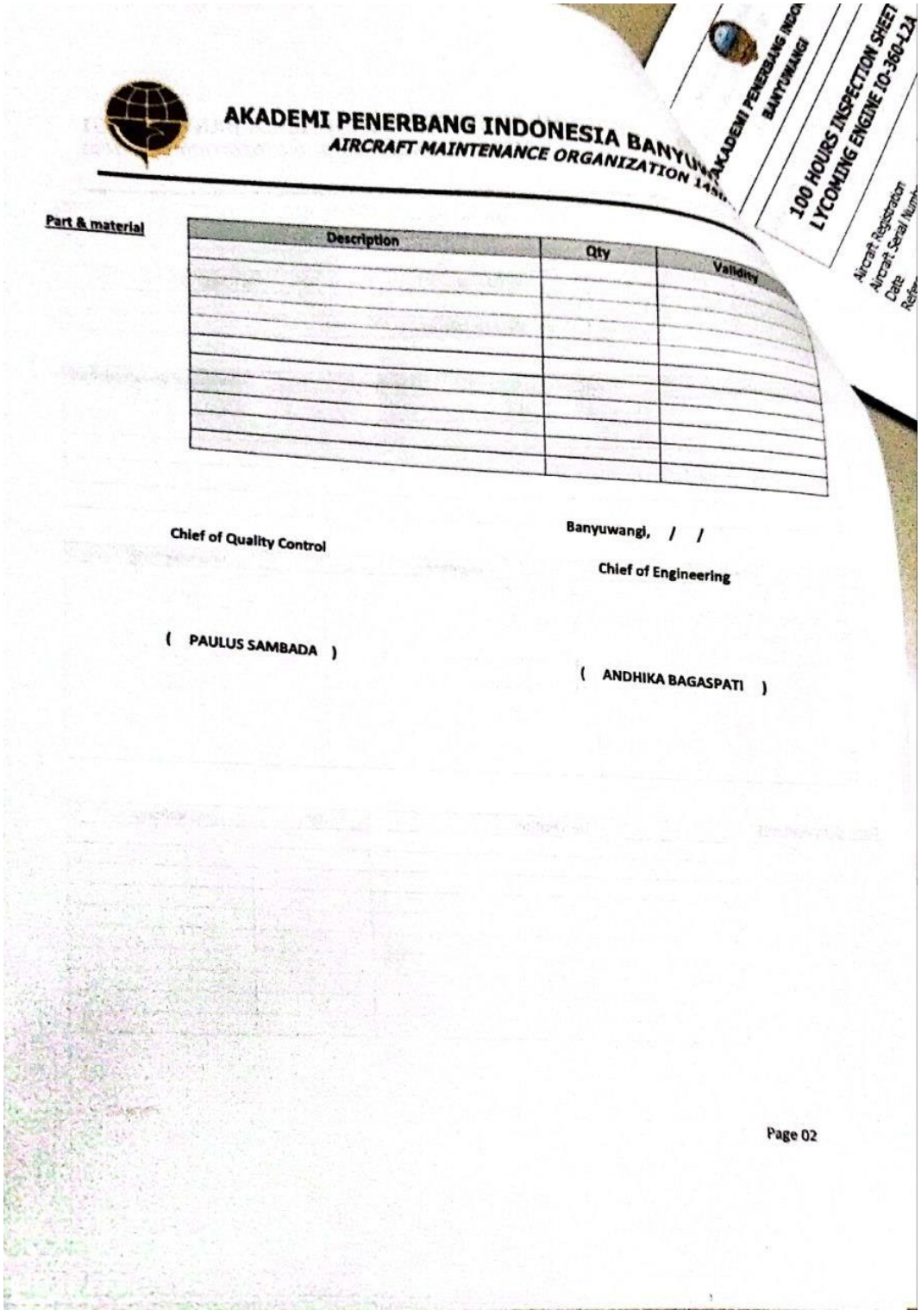

AKADEMI PENERBANG INDONESIA BANYU
AIRCRAFT MAINTENANCE ORGANIZATION

AKADEMI PENERBANG INDO
BANYUWANGI

100 HOURS INSPECTION SHEET
LYCOMING ENGINE IO-360-L2A

Aircraft Registration
Aircraft Serial Numb
Date
Refe

Part & material

Description	Qty	Validity

Banyuwangi, / /

Chief of Quality Control

(PAULUS SAMBADA)

Chief of Engineering

(ANDHIKA BAGASPATI)

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BANYUWANGI

MAINTENANCE PROGRAM
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APPENDIX

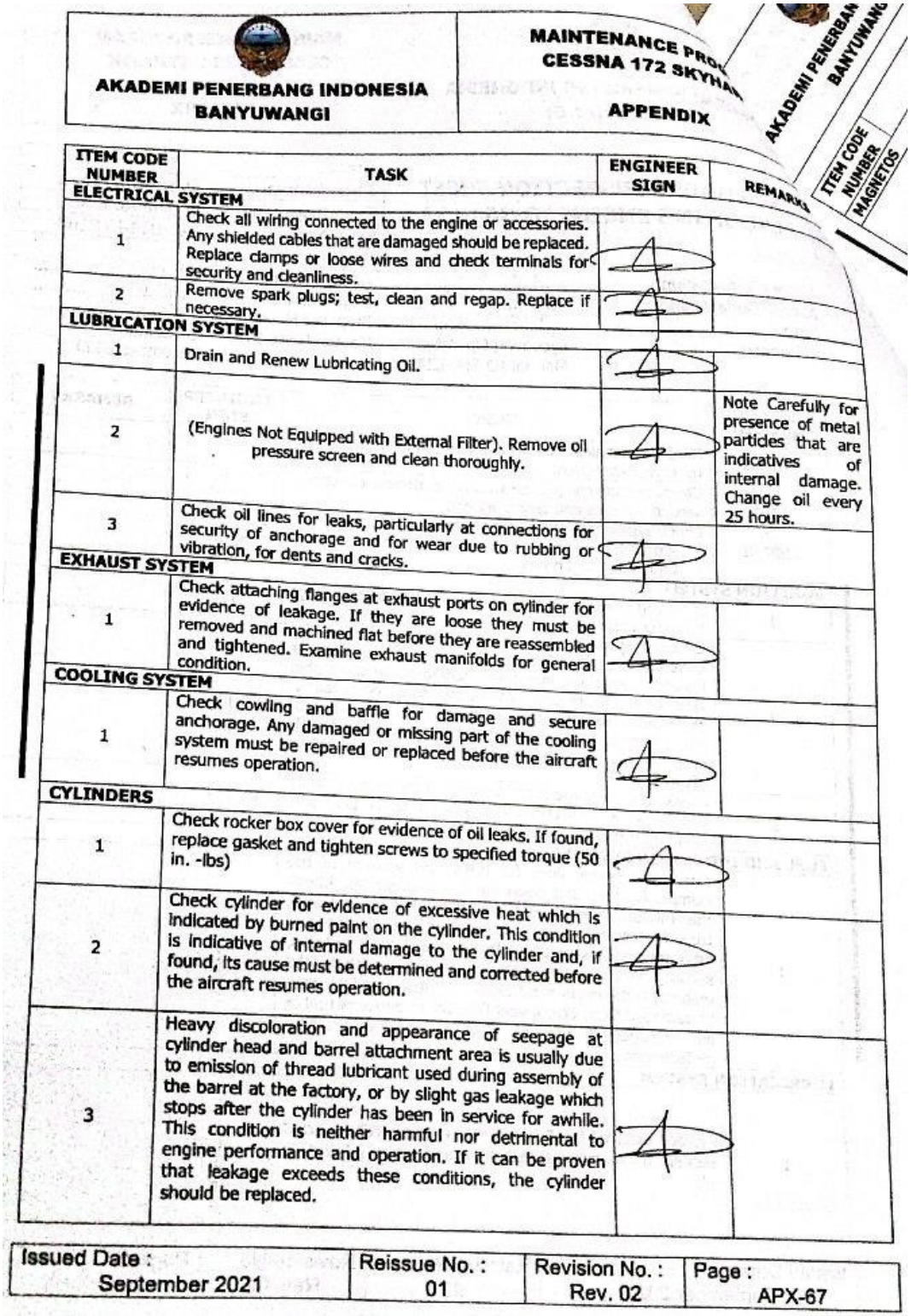
100 HOURS INSPECTION SHEET
LYCOMING ENGINE IO-360-L2A

Due at	:	
Insp. Interval	:	Every 100 Hours
Type Inspection	:	Engine Routine
Form No.	:	141-014-LYC100

Aircraft Registration : PK-BYS
Aircraft Serial Number : 172S11705
Date : 9 mei 2024
Reference : Lycoming Operator Manual IO-360-L2A

Aircraft Hours : 1097 : 15
Engine Hours : 1097 : 15
Propeller Hours : 1097 : 15
Manual Revision : 8th Edition December 2009

ITEM CODE NUMBER	TASK	ENGINEER SIGN	REMARKS
000000	Record anomalies into log book or equivalent document for corrective action.		
000000	Check aircraft compliance with airworthiness directives, service bulletins and service letters.		
000000	Check expiry date of life-limited parts : - Airframe - Equipment and hoses		
IGNITION SYSTEM			
1	If fouling of spark plugs is apparent, rotate bottom plugs to upper position.		
2	Examine spark plug leads of cable and ceramics for corrosion deposits. This condition is evidence of either leaking spark plugs, improper cleaning of the spark plug walls or connector ends. Where this condition is found, clean the cable ends, spark plug walls and ceramics with a dry, clean cloth or a clean cloth moistened with methyl-ethyl-ketone. All parts should be clean and dry before assembly.		
3	Check ignition harness for security of mounting clamps and be sure connections are tight at spark plug and magneto terminals.		
FUEL AND INDUCTION SYSTEM			
1	Check the primer lines for leaks and security of the clamps. Remove and clean the fuel inlet strains. Check the mixture control and throttle linkage for travel, freedom of movement, security of the clamps and lubricate if necessary. Check the air intake ducts for leaks, security filter damage; evidence of dust or other solid material in the ducts is indicative of inadequate filter care or damaged filter. Check vent lines for evidence of fuel or oil seepage; if present, fuel pump may require replacement.		
LUBRICATION SYSTEM			
1	Replace external full flow oil filter element (Check used element for metal particles) drain and renew lubricating oil.		



AKADEMI PENERBANG INDONESIA
BANYUWANGI

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ITEM CODE NUMBER	TASK	ENGINEER SIGN	REMARKS
ELECTRICAL SYSTEM			
1	Check all wiring connected to the engine or accessories. Any shielded cables that are damaged should be replaced. Replace clamps or loose wires and check terminals for security and cleanliness.		
2	Remove spark plugs; test, clean and regap. Replace if necessary.		
LUBRICATION SYSTEM			
1	Drain and Renew Lubricating Oil.		
2	(Engines Not Equipped with External Filter). Remove oil pressure screen and clean thoroughly.		Note Carefully for presence of metal particles that are indicatives of internal damage. Change oil every 25 hours.
3	Check oil lines for leaks, particularly at connections for security of anchorage and for wear due to rubbing or vibration, for dents and cracks.		
EXHAUST SYSTEM			
1	Check attaching flanges at exhaust ports on cylinder for evidence of leakage. If they are loose they must be removed and machined flat before they are reassembled and tightened. Examine exhaust manifolds for general condition.		
COOLING SYSTEM			
1	Check cowling and baffle for damage and secure anchorage. Any damaged or missing part of the cooling system must be repaired or replaced before the aircraft resumes operation.		
CYLINDERS			
1	Check rocker box cover for evidence of oil leaks. If found, replace gasket and tighten screws to specified torque (50 in. -lbs)		
2	Check cylinder for evidence of excessive heat which is indicated by burned paint on the cylinder. This condition is indicative of internal damage to the cylinder and, if found, its cause must be determined and corrected before the aircraft resumes operation.		
3	Heavy discoloration and appearance of seepage at cylinder head and barrel attachment area is usually due to emission of thread lubricant used during assembly of the barrel at the factory, or by slight gas leakage which stops after the cylinder has been in service for awhile. This condition is neither harmful nor detrimental to engine performance and operation. If it can be proven that leakage exceeds these conditions, the cylinder should be replaced.		

REMARKS

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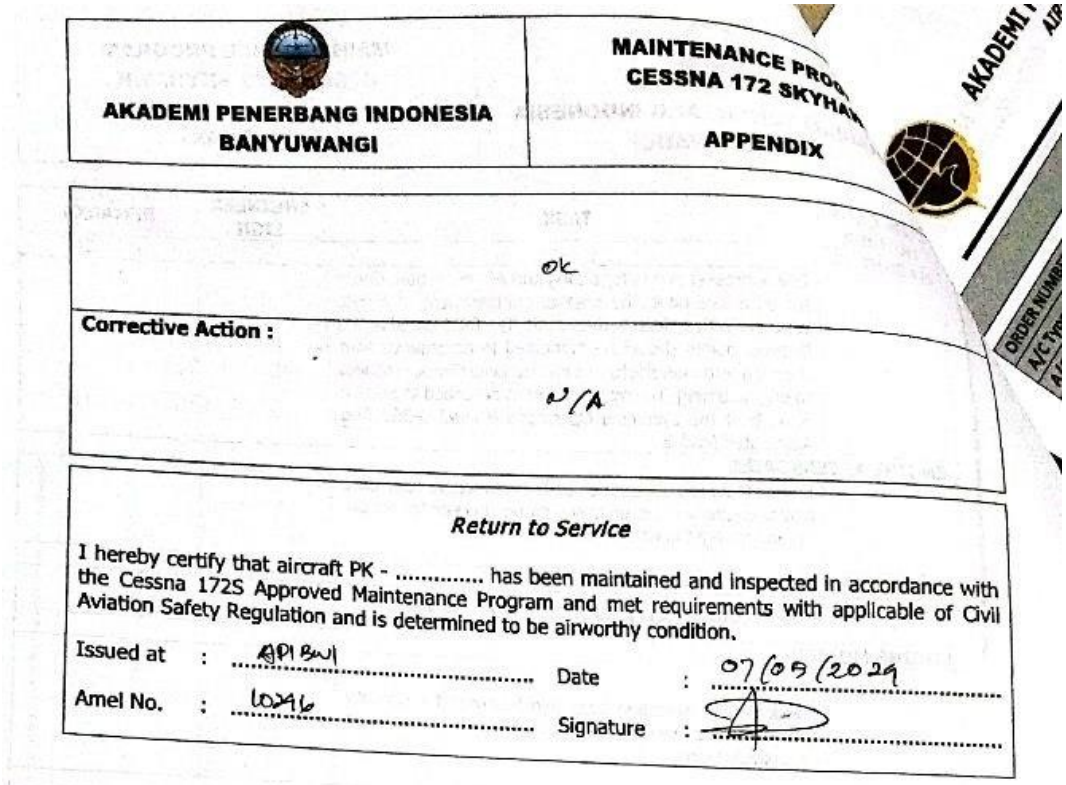
ITEM CODE NUMBER	TASK	ENGINEER SIGN	REMARKS
MAGNETOS			
1	Check breaker points for pitting and minimum gap. Check for excessive oil in the breaker compartment, if found, wipe dry with a clean lintless cloth. The felt located at the breaker points should be lubricated in accordance with the magneto manufacturer's instructions. Check magneto to engine timing. Timing procedure is described in Section 5, 1, b of the Lycoming Operator's Manual O-360 And Associated Models		
ENGINE ACCESSORIES			
1	Engine Mounted accessories such as pumps, temperature and pressure sensing units should be checked for secure mounting, tight connections.		
CYLINDERS			
1	Check cylinders visually for cracked or broken fins.		
ENGINE MOUNTS			
1	Check engine mounting bolts and bushings for security and excessive wear. Replace any bushings that are excessively worn.		
FUEL INJECTION NOZZLES AND FUEL LINES			
1	Check fuel injector nozzles for looseness, tighten to 60 in. -lbs torque. Check fuel line for dye stains at connection indicating leakage and security of line. Repair or replacement must be accomplished before the aircraft resumes operation.		
FINAL STEPS			
000000	Perform a test run-up. Record parameters (at engine shutdown).		
000000	After the test run-up, remove upper and lower engine cowlings and check for leaks (oil, fuel, air, exhaust gases). If everything is normal, reinstall the engine cowlings and check that they are correctly locked.		
000000	Record this inspection in the aircraft maintenance files (airframe, engine and propeller log books).		

Component Replacement Record

No.	Description	S/N OFF	S/N ON	Sign

Inspection Result :



AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROG... CESSNA 172 SKYHA... APPENDIX

OK

Corrective Action :

N/A

Return to Service

I hereby certify that aircraft PK - ..... has been maintained and inspected in accordance with the Cessna 172S Approved Maintenance Program and met requirements with applicable of Civil Aviation Safety Regulation and is determined to be airworthy condition.

Issued at : ABI Bwi ..... Date : 07/09/2024

Amel No. : 10246 ..... Signature : .....

AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-1006

WORK ORDER

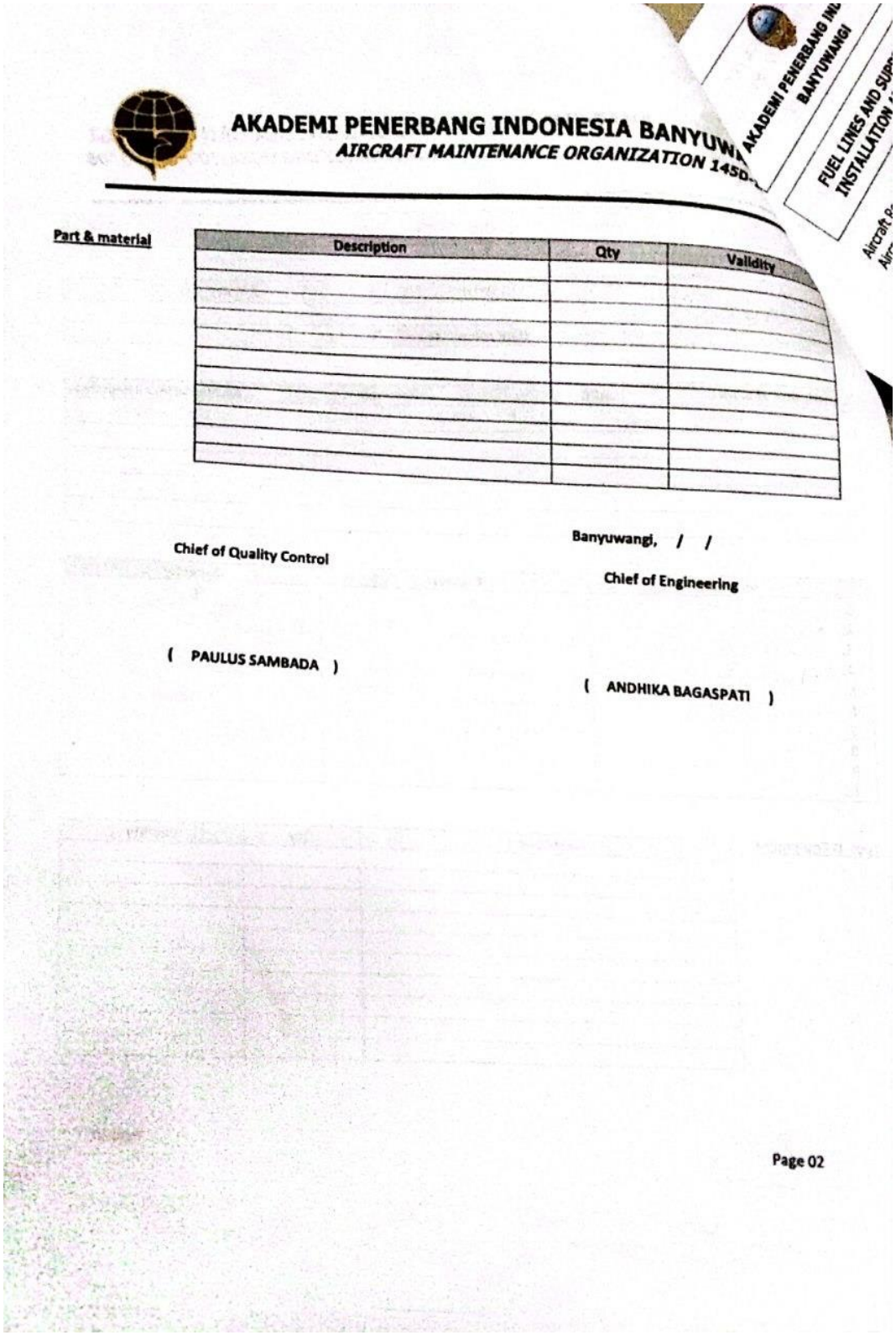
ORDER NUMBER	:				
A/C Type	: C172S	A/C Serial	: 172S11705	A/C Reg	: PK-BYS
A/C Total flying hours	: 1097:15				
Place	: ABH BWI	Date completed	: 7 mei 2024		

Description of work :	☐ ARC	☐ Resolved	☐ Additional Work Required
1. fuel liner and support camp installation and inspection			
2.			
3.			
4.			
5.			

Mechanic	Engineer	Inspector
1. Eko P.	1. Erfan	1. Yogi A.
2. fauzila	2. Macdha	2. Fayar H.
3. Ickbal	3. Dimas	
4. Hendrik	4. Yoga	
5.	5. Agi S.	
6.		
7.		
8.		
9.		
10.		

Tool & Equipment

Description	Qty	Validity



AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-

AKADEMI PENERBANG IND
BANYUWANGI

FUEL LINES AND SUP
INSTALLATION

Part & material

Description	Qty	Validity

Banyuwangi, / /

Chief of Quality Control

(PAULUS SAMBADA)

Chief of Engineering

(ANDHIKA BAGASPATI)

Page 02

AKADEMI PENERBANG INDONESIA
BANYUWANGI

MAINTENANCE PROGRAM
CESSNA 172 SKYHAWK

APPENDIX

FUEL LINES AND SUPPORT CLAMP INSTALLATION AND INSPECTION

Repetitive Airworthiness Directive

Type Inspection : Mandatory
Form No. : 141-014-RAD_01

Aircraft Registration : PK-BYS
Aircraft Serial Number : 17311705
Date : 2 Mei 2024

Aircraft Hours : 1092 : 15
Engine Hours : 1047 : 40
Propeller Hours : 1052 : 15

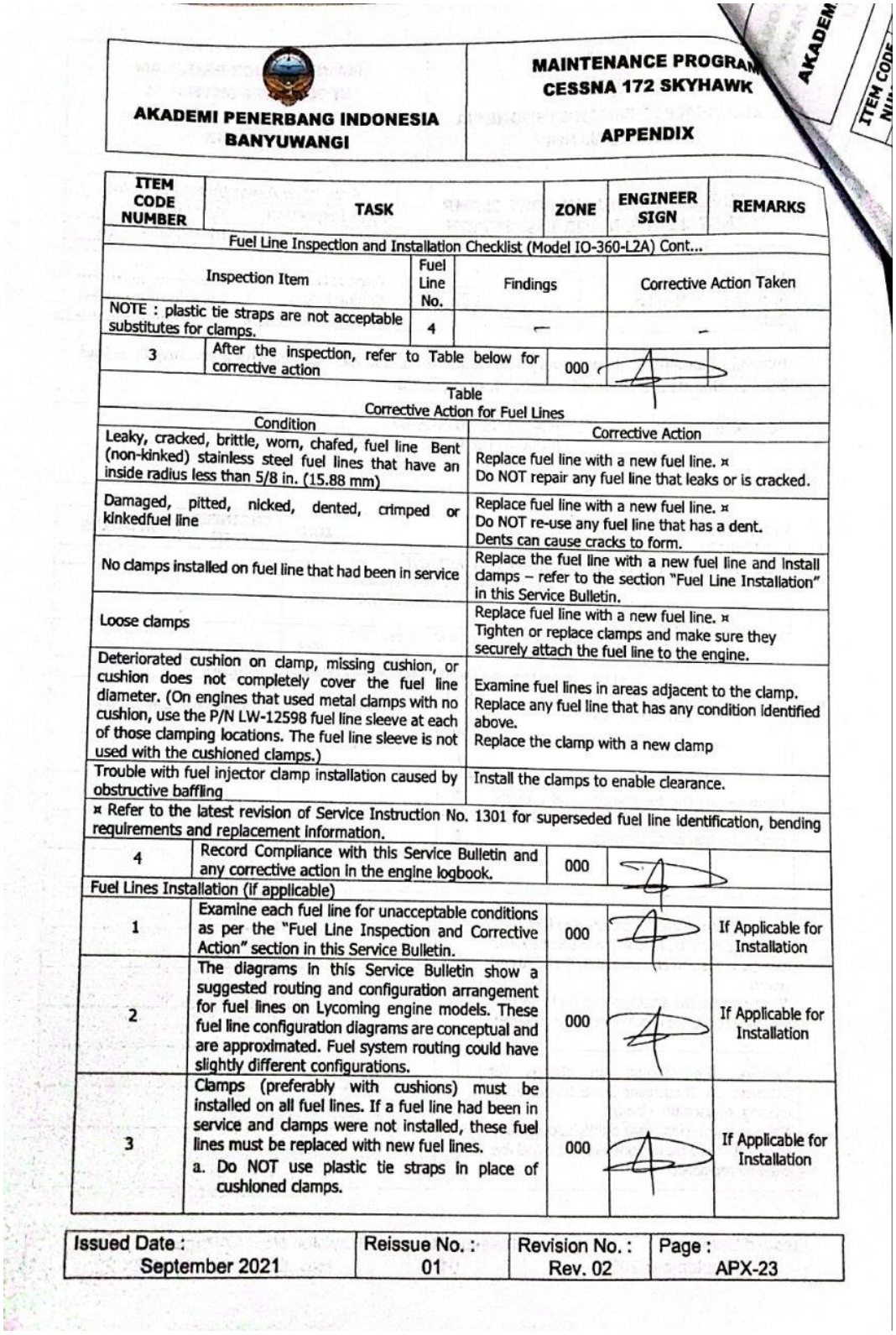
Interval : Examine fuel lines every 100 hours, annual inspection, overhaul and any time fuel lines or clamps are serviced, removed, or replaced.

Reference : FAA AD No. 2015-19-07
EASA AD No. US-2015-19-07

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
FUEL LINE INSPECTION AND CORRECTIVE ACTION				
1	Identify the fuel line by number. Four-cylinder engines usually have four fuel lines (Model IO-360-L2A)	000		
2	Examine each fuel line and record findings per Fuel Line Inspection and Installation Checklist below.	000		

Fuel Line Inspection and Installation Checklist (Model IO-360-L2A)

Inspection Item	Fuel Line No.	Findings	Corrective Action Taken
Examine fuel line for damage, leaks, dents, pits, nicks, kinks, stains caused by fuel leaks, cracks, brittleness or chaffing	1		
	2		
	3		
	4		
Clamps (with cushions) attached to fuel lines. Fuel lines must be held in place securely with clamps in position approximately 8 in. (20 cm) apart. If no clamps are attached the fuel line that was in service, the fuel line must be replaced.	1		
	2		
	3		
	4		
Examine the cushion on clamps for deterioration. If cushions are deteriorated or missing, replace the clamp. Make sure the clamp are tightly secured and attached. If the clamps are loose, the fuel line must be replaced.	1		
	2		
	3		



AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

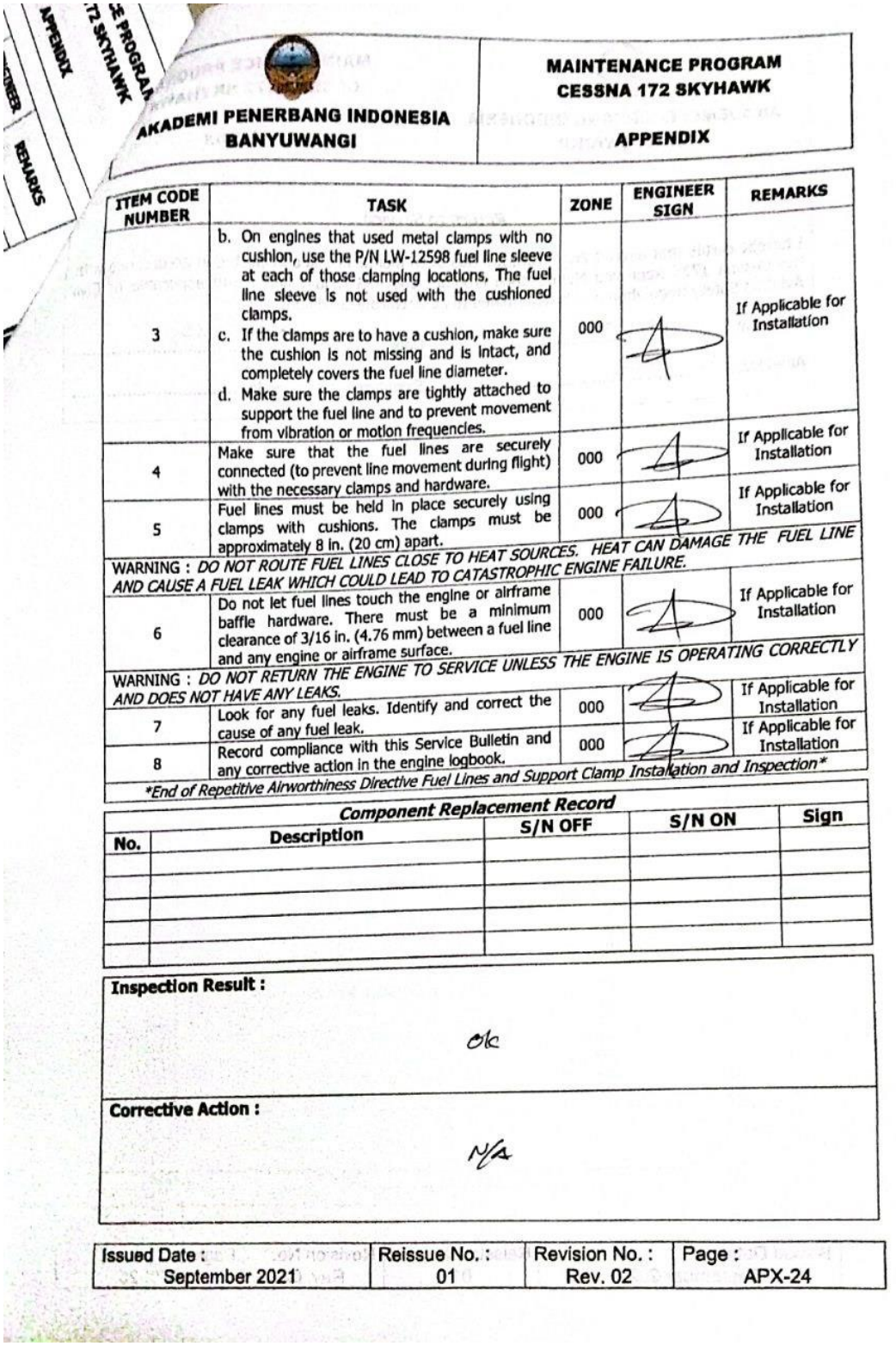
ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
Fuel Line Inspection and Installation Checklist (Model IO-360-L2A) Cont...				
Inspection Item	Fuel Line No.	Findings	Corrective Action Taken	
NOTE : plastic tie straps are not acceptable substitutes for clamps.	4	-	-	
3	After the inspection, refer to Table below for corrective action	000		

Table
Corrective Action for Fuel Lines

Condition	Corrective Action
Leaky, cracked, brittle, worn, chafed, fuel line Bent (non-kinked) stainless steel fuel lines that have an inside radius less than 5/8 in. (15.88 mm)	Replace fuel line with a new fuel line. ¤ Do NOT repair any fuel line that leaks or is cracked.
Damaged, pitted, nicked, dented, crimped or kinkedfuel line	Replace fuel line with a new fuel line. ¤ Do NOT re-use any fuel line that has a dent. Dents can cause cracks to form.
No clamps installed on fuel line that had been in service	Replace the fuel line with a new fuel line and install clamps – refer to the section "Fuel Line Installation" in this Service Bulletin.
Loose clamps	Replace fuel line with a new fuel line. ¤ Tighten or replace clamps and make sure they securely attach the fuel line to the engine.
Deteriorated cushion on clamp, missing cushion, or cushion does not completely cover the fuel line diameter. (On engines that used metal clamps with no cushion, use the P/N LW-12598 fuel line sleeve at each of those clamping locations. The fuel line sleeve is not used with the cushioned clamps.)	Examine fuel lines in areas adjacent to the clamp. Replace any fuel line that has any condition identified above. Replace the clamp with a new clamp
Trouble with fuel injector clamp installation caused by obstructive baffling	Install the clamps to enable clearance.

¤ Refer to the latest revision of Service Instruction No. 1301 for superseded fuel line identification, bending requirements and replacement information.

4	Record Compliance with this Service Bulletin and any corrective action in the engine logbook.	000		
Fuel Lines Installation (if applicable)				
1	Examine each fuel line for unacceptable conditions as per the "Fuel Line Inspection and Corrective Action" section in this Service Bulletin.	000		If Applicable for Installation
2	The diagrams in this Service Bulletin show a suggested routing and configuration arrangement for fuel lines on Lycoming engine models. These fuel line configuration diagrams are conceptual and are approximated. Fuel system routing could have slightly different configurations.	000		If Applicable for Installation
3	Clamps (preferably with cushions) must be installed on all fuel lines. If a fuel line had been in service and clamps were not installed, these fuel lines must be replaced with new fuel lines. a. Do NOT use plastic tie straps in place of cushioned clamps.	000		If Applicable for Installation



AKADEMI PENERBANG INDONESIA
BANYUWANGI

MAINTENANCE PROGRAM
CESSNA 172 SKYHAWK
APPENDIX

ITEM CODE NUMBER	TASK	ZONE	ENGINEER SIGN	REMARKS
3	b. On engines that used metal clamps with no cushion, use the P/N LW-12598 fuel line sleeve at each of those clamping locations. The fuel line sleeve is not used with the cushioned clamps. c. If the clamps are to have a cushion, make sure the cushion is not missing and is intact, and completely covers the fuel line diameter. d. Make sure the clamps are tightly attached to support the fuel line and to prevent movement from vibration or motion frequencies.	000		If Applicable for Installation
4	Make sure that the fuel lines are securely connected (to prevent line movement during flight) with the necessary clamps and hardware.	000		If Applicable for Installation
5	Fuel lines must be held in place securely using clamps with cushions. The clamps must be approximately 8 in. (20 cm) apart.	000		If Applicable for Installation
WARNING : *DO NOT ROUTE FUEL LINES CLOSE TO HEAT SOURCES. HEAT CAN DAMAGE THE FUEL LINE AND CAUSE A FUEL LEAK WHICH COULD LEAD TO CATASTROPHIC ENGINE FAILURE.*				
6	Do not let fuel lines touch the engine or airframe baffle hardware. There must be a minimum clearance of 3/16 in. (4.76 mm) between a fuel line and any engine or airframe surface.	000		If Applicable for Installation
WARNING : *DO NOT RETURN THE ENGINE TO SERVICE UNLESS THE ENGINE IS OPERATING CORRECTLY AND DOES NOT HAVE ANY LEAKS.*				
7	Look for any fuel leaks. Identify and correct the cause of any fuel leak.	000		If Applicable for Installation
8	Record compliance with this Service Bulletin and any corrective action in the engine logbook.	000		If Applicable for Installation
End of Repetitive Airworthiness Directive Fuel Lines and Support Clamp Installation and Inspection				

Component Replacement Record

No.	Description	S/N OFF	S/N ON	Sign

Inspection Result :

ok

Corrective Action :

N/A

Issued Date :	Reissue No. :	Revision No. :	Page :
September 2021	01	Rev. 02	APX-24

AKADEMI PENERBANG INDONESIA BANYUWANGI	MAINTENANCE PROGRAM CESSNA 172 SKYHAWK APPENDIX

Return to Service

I hereby certify that aircraft PK - ..... has been maintained and inspected in accordance with the Cessna 172S Approved Maintenance Program and met requirements with applicable of Civil Aviation Safety Regulation and is determined to be airworthy condition.

Issued at : API BWI Date : 07/05/2024

Amel No. : 10246 Signature : .....

Attachment 1.

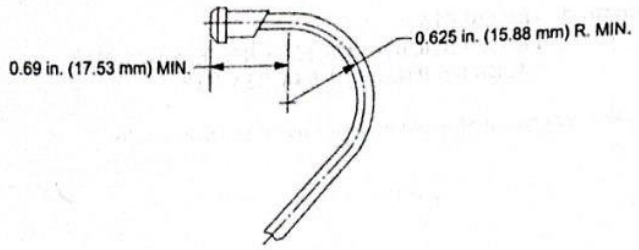


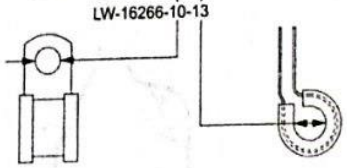
Figure 1. Fuel Line Showing Minimum Dimension for Bending

PLEASE Note ... When installing clamps, it does not matter whether the clamp is installed to the right or left of the shroud tube, only that it is clamped at that location and there is 3/16 inch (4.76 mm) clearance between the line and any engine surface.

CLAMP P/N DESIGNATION

SCREW SIZE — CLAMP DIAMETER

LW-16266-10-13

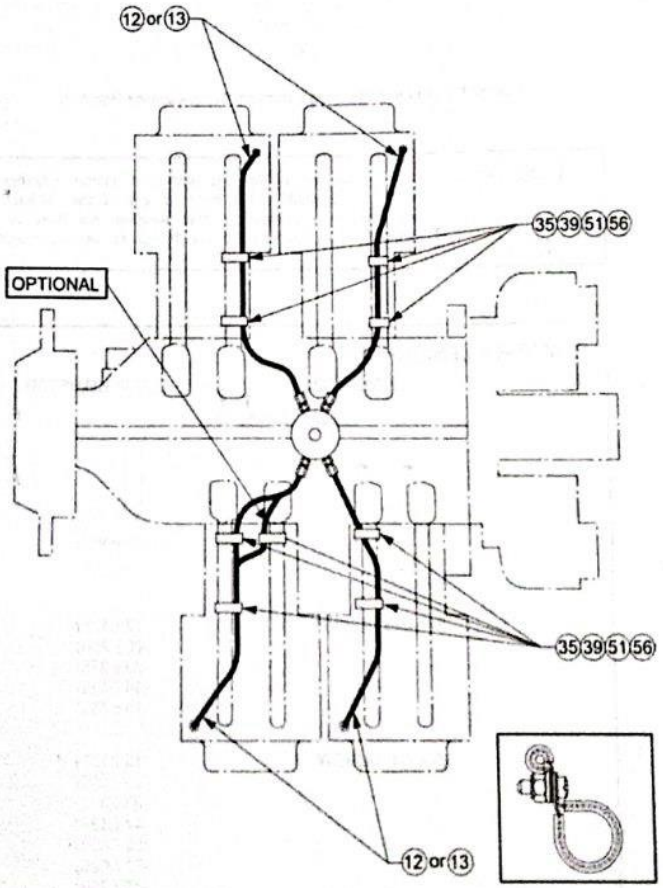


10 = #10 SCREW	-13 (.125) -25 (.250) -38 (.375) -44 (.438) -75 (.750)
25 = 1/4" SCREW	-13 (.125) -25 (.250) -38 (.375) -44 (.438) -50 (.500) -63 (.625) -75 (.750)

Attachment 2.

Diagram No. 1 --IO-320-B1A
IO-360-B1B, B1F, B2F, B2F6, B4A, F1A, L2A, M1A
AEIO-360-B1G6, B1H, B4A, H1A, H1B

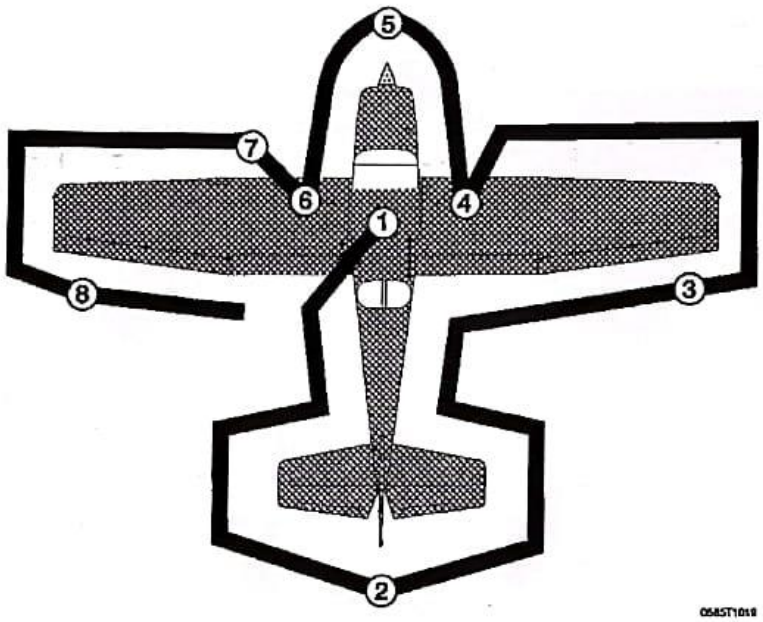
NOTE: Underlined engine models indicate new engine model added to the list



ISSUED			REVISED			PAGE NO.	REVISION	
MO	DAY	YEAR	MO	DAY	YEAR			G-Sup.1
08	29	13	--	--	--	2 of 2	---	

Lampiran 3 Procedures Preflight Inspection

NORMAL PROCEDURES
PREFLIGHT INSPECTION



NOTE

Visually check airplane for general condition during walk-around inspection. Airplane should be parked in a normal ground attitude, refer to Figure 1-1, to make sure that fuel drain valves allow for accurate sampling. Use of the refueling steps and assist handles will simplify access to the upper wing surfaces for visual checks and refueling operations. In cold weather, remove even small accumulations of frost, ice or snow from wing, tail and control surfaces. Also, make sure that control surfaces contain no internal accumulations of ice or debris. Prior to flight, check that pitot heater is warm to touch within 30 seconds with battery and pitot heat switches on. If a night flight is planned, check operation of all lights, verify all LED landing/taxi light bulbs are operational (if installed) and make sure a flashlight is available.

Figure 4-1

PREFLIGHT INSPECTION (Continued)

① CABIN

1. Pitot Tube Cover - REMOVE (check for pitot blockage)
2. Pilot's Operating Handbook - ACCESSIBLE TO PILOT
3. Garmin G1000 Cockpit Reference Guide - ACCESSIBLE TO PILOT
4. Airplane Weight and Balance - CHECKED
5. Parking Brake - SET
6. Control Wheel Lock - REMOVE

WARNING

WHEN THE MASTER SWITCH IS ON, USING AN EXTERNAL POWER SOURCE, OR MANUALLY ROTATING THE PROPELLER, TREAT THE PROPELLER AS IF THE MAGNETOS SWITCH WERE ON. DO NOT STAND, NOR ALLOW ANYONE ELSE TO STAND, WITHIN THE ARC OF THE PROPELLER SINCE A LOOSE OR BROKEN WIRE, OR A COMPONENT MALFUNCTION, COULD CAUSE THE ENGINE TO START.

7. MAGNETOS Switch - OFF
8. AVIONICS Switch (BUS 1 and BUS 2) - OFF
9. MASTER Switch (ALT and BAT) - ON
10. Primary Flight Display (PFD) - CHECK (verify PFD is ON)
11. FUEL QTY (L and R) - CHECK
12. LOW FUEL L and LOW FUEL R Annunciators - CHECK (verify annunciators are not shown on PFD)
13. OIL PRESSURE Annunciator - CHECK (verify annunciator is shown)
14. LOW VACUUM Annunciator - CHECK (verify annunciator is shown) (if installed)
15. AVIONICS Switch (BUS 1) - ON
16. Forward Avionics Fan - CHECK (verify fan is heard)

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

① CABIN (Continued)

17. AVIONICS Switch (BUS 1) - OFF
18. AVIONICS Switch (BUS 2) - ON
19. Aft Avionics Fan - CHECK (verify fan is heard)
20. AVIONICS Switch (BUS 2) - OFF
21. PITOT HEAT Switch - ON (carefully check that pitot tube is warm to the touch within 30 seconds)
22. PITOT HEAT Switch - OFF
23. LOW VOLTS Annunciator - CHECK (verify annunciator is shown)
24. MASTER Switch (ALT and BAT) - OFF
25. Elevator Trim Control - TAKEOFF position
26. FUEL SELECTOR Valve - BOTH
27. ALT STATIC AIR Valve - OFF (push full in)
28. Fire Extinguisher - CHECK (verify gage pointer in green arc)

② EMPENNAGE

1. Baggage Compartment Door - CHECK (lock with key)
2. Rudder Gust Lock - REMOVE (if installed)
3. Tail Tiedown - DISCONNECT
4. Control Surfaces - CHECK (freedom of movement and security)
5. Elevator Trim Tab - CHECK (security)
6. Antennas - CHECK (security of attachment and general condition)

③ RIGHT WING Trailing Edge

1. Flap - CHECK (security and condition)
2. Aileron - CHECK (freedom of movement and security)

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

④ RIGHT WING

1. Landing/Taxi Light(s) - CHECK (condition and cleanliness of cover) (If installed)
2. Wing Tiedown - DISCONNECT
3. Main Wheel Tire - CHECK (proper inflation and general condition (weather checks, tread depth and wear, etc.))
4. Fuel Tank Sump Quick Drain Valves - DRAIN

   Drain at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment, and proper fuel grade before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from **all** fuel drain points until **all** contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly airplane.

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard or damage to the environment.

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

5. Fuel Quantity - CHECK VISUALLY (for desired level)
6. Fuel Filler Cap - SECURE and VENT CLEAR

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

⑤ NOSE

1. Fuel Strainer Quick Drain Valve (located on bottom of fuselage) - DRAIN

   Drain at least a cupful of fuel (using sampler cup) from valve to check for water, sediment, and proper fuel grade before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from **all** fuel drain points, including the fuel reservoir and fuel selector, until **all** contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly the airplane.

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard, or damage to the environment.

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

2. Engine Oil Dipstick/Filler Cap:
   a. Oil level - CHECK
   b. Dipstick/filler cap - SECURE

NOTE

Do not operate with less than 5 quarts. Fill to 8 quarts for extended flight.

3. Engine Cooling Air Inlets - CHECK (clear of obstructions)
4. Propeller and Spinner - CHECK (for nicks and security)
5. Air Filter - CHECK (for restrictions by dust or other foreign matter)

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

⑤ **NOSE** (Continued)

6. Nosewheel Strut and Tire - CHECK (proper inflation of strut and general condition of tire (weather checks, tread depth and wear, etc.))
7. Static Source Opening (left side of fuselage) - CHECK (verify opening is clear)

⑥ **LEFT WING**

1. Fuel Quantity - CHECK VISUALLY (for desired level)
2. Fuel Filler Cap - SECURE and VENT CLEAR
3. Fuel Tank Sump Quick Drain Valves - DRAIN

Drain at least a cupful of fuel (using sampler cup) from each sump location to check for water, sediment, and proper fuel grade before each flight and after each refueling. If water is observed, take further samples until clear and then gently rock wings and lower tail to the ground to move any additional contaminants to the sampling points. Take repeated samples from **all** fuel drain points until **all** contamination has been removed. If contaminants are still present, refer to WARNING below and do not fly airplane.

NOTE

Collect all sampled fuel in a safe container. Dispose of the sampled fuel so that it does not cause a nuisance, hazard, or damage to the environment.

WARNING

IF, AFTER REPEATED SAMPLING, EVIDENCE OF CONTAMINATION STILL EXISTS, THE AIRPLANE SHOULD NOT BE FLOWN. TANKS SHOULD BE DRAINED AND SYSTEM PURGED BY QUALIFIED MAINTENANCE PERSONNEL. ALL EVIDENCE OF CONTAMINATION MUST BE REMOVED BEFORE FURTHER FLIGHT.

4. Main Wheel Tire - CHECK (proper inflation and general condition (weather checks, tread depth and wear, etc.))

(Continued Next Page)

PREFLIGHT INSPECTION (Continued)

⑦ LEFT WING Leading Edge

1. Fuel Tank Vent Opening - CHECK (blockage)
2. Stall Warning Opening - CHECK (blockage)

NOTE

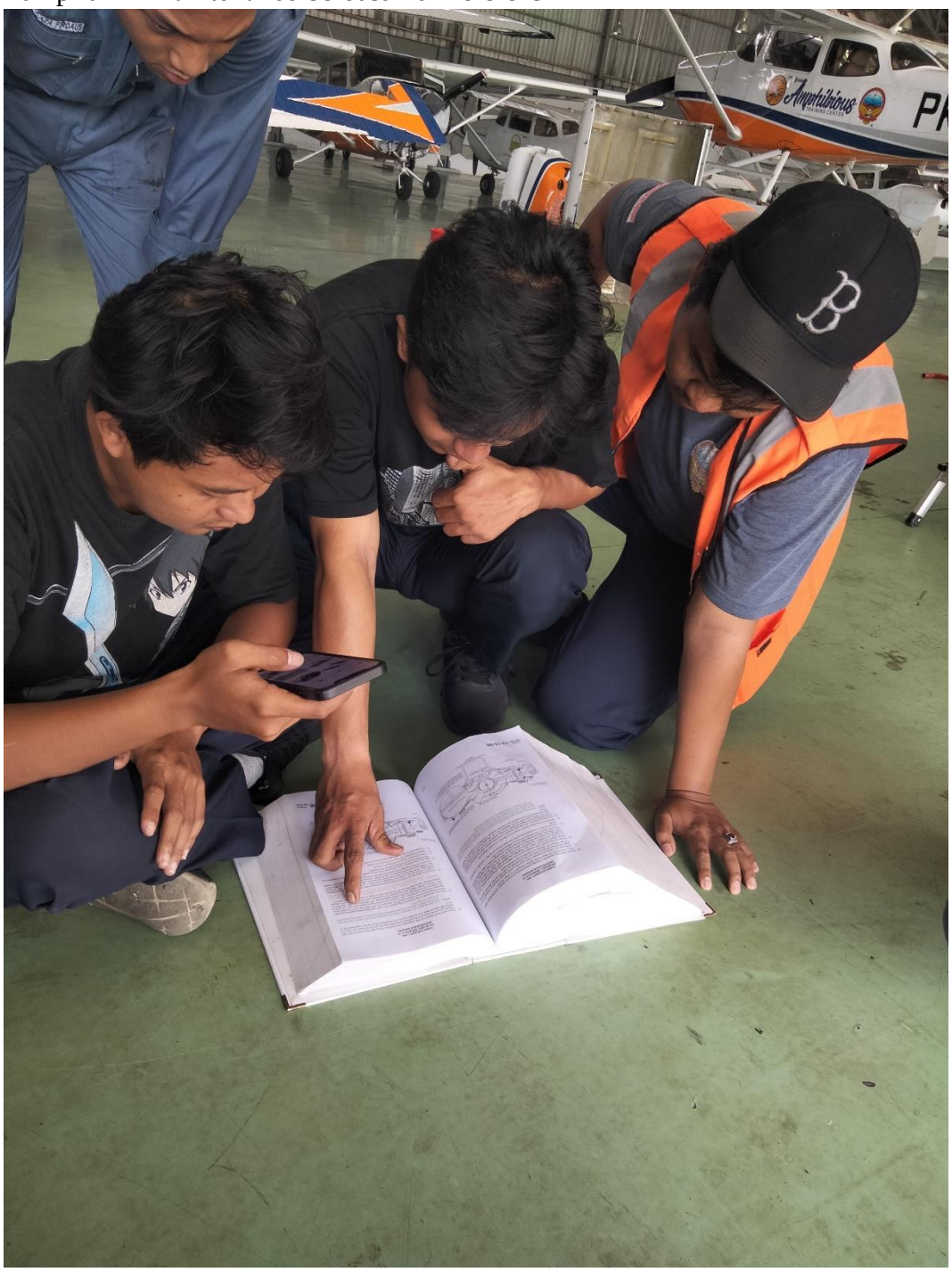
To check the system, place a clean handkerchief over the vent opening and apply suction; a sound from the warning horn will confirm system operation.

3. Wing Tiedown - DISCONNECT
4. Landing/Taxi Light(s) - CHECK (condition and cleanliness of cover)

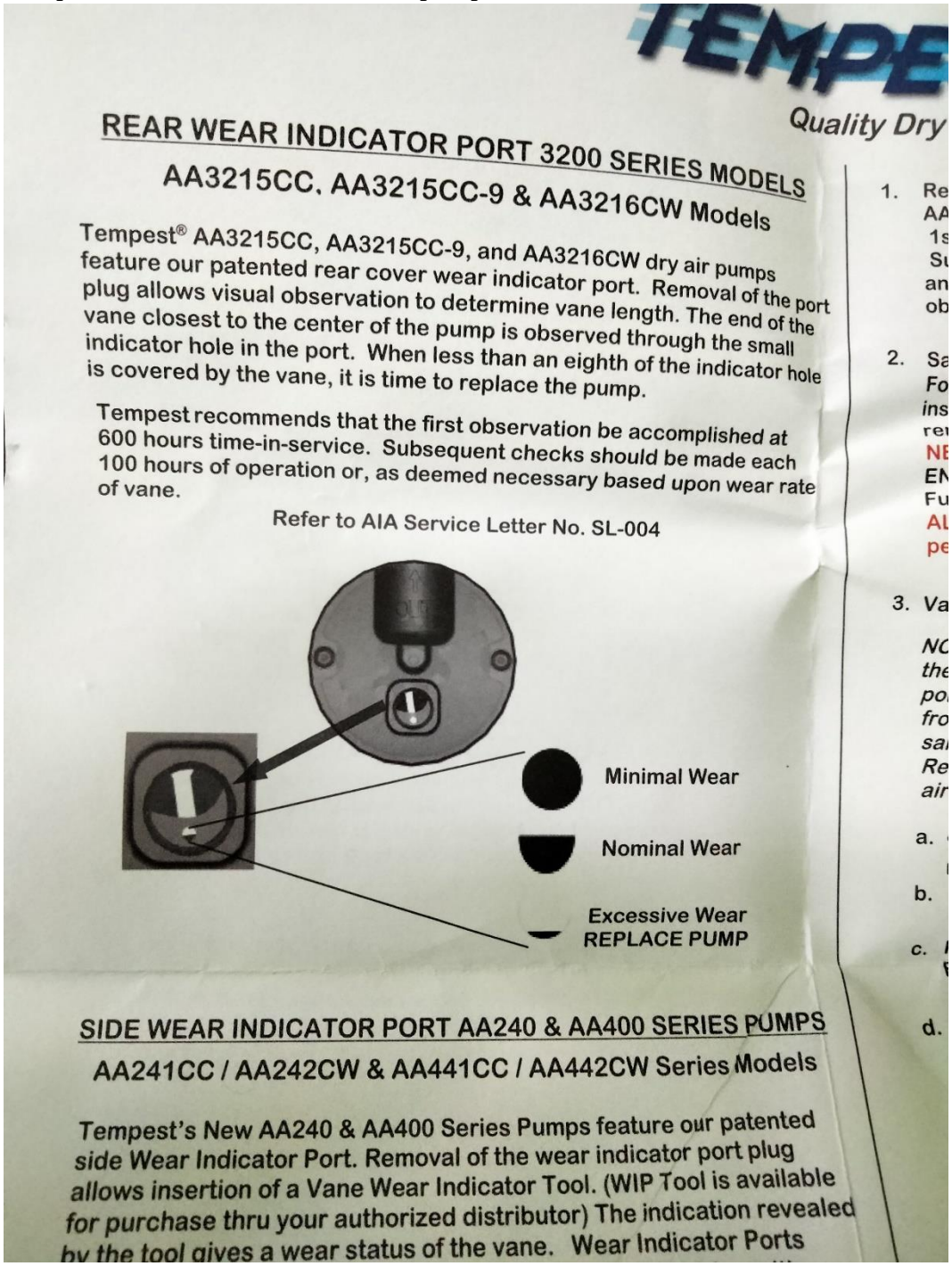
⑧ LEFT WING Trailing Edge

1. Aileron - CHECK (freedom of movement and security)
2. Flap - CHECK (security and condition)

Lampiran 4 *Maintenance* berdasarkan referensi AMM



Lampiran 5 limits brush in vacuum pump



TEMPE

Quality Dry

REAR WEAR INDICATOR PORT 3200 SERIES MODELS

AA3215CC, AA3215CC-9 & AA3216CW Models

Tempest® AA3215CC, AA3215CC-9, and AA3216CW dry air pumps feature our patented rear cover wear indicator port. Removal of the port plug allows visual observation to determine vane length. The end of the vane closest to the center of the pump is observed through the small indicator hole in the port. When less than an eighth of the indicator hole is covered by the vane, it is time to replace the pump.

Tempest recommends that the first observation be accomplished at 600 hours time-in-service. Subsequent checks should be made each 100 hours of operation or, as deemed necessary based upon wear rate of vane.

Refer to AIA Service Letter No. SL-004

SIDE WEAR INDICATOR PORT AA240 & AA400 SERIES PUMPS

AA241CC / AA242CW & AA441CC / AA442CW Series Models

Tempest's New AA240 & AA400 Series Pumps feature our patented side Wear Indicator Port. Removal of the wear indicator port plug allows insertion of a Vane Wear Indicator Tool. (WIP Tool is available for purchase thru your authorized distributor) The indication revealed by the tool gives a wear status of the vane. Wear Indicator Ports

1. Re
AA
1s
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an
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2. Sa
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EN
Fu
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the
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Re
air

a.

b.

c.

d.

Lampiran 6 *Work order replace rockerbox gasket due to oil leak.*

AKADEMI PENERBANG INDONESIA BANYUWANGI
AIRCRAFT MAINTENANCE ORGANIZATION 145D-1006

WORK ORDER

ORDER NUMBER	:				
A/C Type	: Seneca V	A/C Serial	: 3449507	A/C Reg	: PK-ARY
A/C Total flying hours	: 1398 : 17				
Place	: API BWI	Date completed	: 22/01/2024		

Description of work :	ARC	Resolved	Additional Work Required
1. Replaced Rocker box Gasket due to oil leak			
2.			
3.			
4.			
5.			

Mechanic	Engineer	Inspector
1. HENDRIK	1. Efan.	1. Fajar H
2. FADZHILA.R	2. MACHDA.P	2. Yogi.A.
3.	3.	
4.		
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8.		
9.		
10.		

Tool & Equipment

Description	Qty	Validity

Page 01

Lampiran 7 *AMM maintenance practice vacuum pump*.

CESSNA AIRCRAFT COMPANY
MODEL 172
MAINTENANCE MANUAL

VACUUM SYSTEM - MAINTENANCE PRACTICES

1. Description and Operation

A. The vacuum system has a filter, vacuum gage, vacuum instruments, regulator valve, vacuum manifold, low vacuum annunciator switches, engine-driven vacuum pumps and related plumbing.

B. On airplanes without Garmin G1000, the source of vacuum air is in the cabin and is pulled through the system by the engine-driven vacuum pumps. This air goes through the gyro filter at the cabin inlet source before it goes through the vacuum gage and gyro instruments. The vacuum is controlled by the regulator valve. The regulator valve is on the aft side of the firewall. The vacuum air is then pulled through the vacuum manifold and past the low vacuum annunciator switches and then into the vacuum pumps.

C. On airplanes without Garmin G1000, vacuum pressure is measured by the low vacuum annunciator switches in the engine compartment. The vacuum gage in the instrument panel shows the vacuum pressure.
(1) The vacuum gage gives a direct indication of the system vacuum in inches of mercury (in.hg.).
(2) The low vacuum annunciator switches are part of the panel annunciator warning system.
(a) If the left vacuum switch (SN012) senses a vacuum below 3.0 in.hg., the VAC annunciator will show L VAC.
(b) If the right vacuum switch (SN011) senses a vacuum below 3.0 in.hg., the VAC annunciator will show VAC R.
(c) If both switches sense a vacuum below 3.0 in.hg., the VAC annunciators will show L VAC R.
(3) For more information on the maintenance practices for the panel-mounted annunciator (UI005), refer to Chapter 31, Annunciator Panel - Maintenance Practices.

D. On airplanes with Garmin G1000, the source of vacuum air is in the cabin and is pulled through the system by the engine-driven vacuum pump. The vacuum pressure is measured by a vacuum transducer. The air goes through the gyro filter at the cabin inlet source before it is goes through the horizon gyro indicator. The vacuum is controlled by the regulator valve. The regulator valve and the vacuum transducer are on the aft side of the firewall.

2. Vacuum Pump Removal/Installation

NOTE: Removal/Installation is typical for the vacuum pumps.

A. Remove the Vacuum Pump (Refer to Figure 201).
(1) Remove engine cowl. Refer to Chapter 71, Cowl - Maintenance Practices.
(2) Remove the cooling shroud.
(3) Disconnect the hoses from the inlet and outlet ports of the vacuum pump.
(a) Put caps on the hoses and the vacuum pump ports to prevent entry of foreign object debris.
(4) Remove the nuts, lockwashers, and flat washers that attach the vacuum pump to the engine.
(5) Remove the vacuum pump from the engine.
(6) Remove the elbow from the pump.
(7) Replace any damaged fittings or nuts.

B. Install the Vacuum Pump (Refer to Figure 201).

Lampiran 8 *Remove and install probe CHT and EGT*

CESSNA®
MODEL 172 (SERIES 1996 AND ON)
MAINTENANCE MANUAL

ENGINE TEMPERATURE INDICATING SYSTEM - MAINTENANCE PRACTICES

1. **Description and Operation**

   A. Maintenance of the engine temperature system includes the removal and installation of the different components.

2. **EGT Indicator Removal/Installation**

   NOTE: The procedures that follow are for airplanes without Garmin G1000.

   A. Remove the EGT Indicator (Refer to Figure 201).
      (1) Get access to the forward side of the indicator.
      (2) Disconnect the electrical connector from the indicator.
      (3) Remove the screws that attach the indicator to the instrument panel and remove the indicator from the airplane.

   B. Install the EGT Indicator (Refer to Figure 201).
      (1) Put the indicator in the instrument panel and attach with the screws.
      (2) Connect the electrical connector to the indicator.

3. **EGT Probe Removal/Installation**

   NOTE: The procedures that follow are for airplanes without Garmin G1000.

   A. Remove the EGT Probe (Refer to Figure 201).
      (1) Remove the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.

      CAUTION: Make sure that the exhaust system and engine are cool before you remove the probes.

      (2) Cut the tie strap that attaches the electrical connectors (JN006) and wire.
      (3) Disconnect the probe at the electrical connector.
      (4) Remove the probe from the muffler tailpipe.

   B. Install the EGT Probe (Refer to Figure 201).
      (1) Install the probe to the muffler tailpipe.
      (2) Tighten the screw for the clamp.
      (3) Attach safety wire to the EGT probe clamp and screw. Refer to Chapter 20, Safetying - Maintenance Practices.
      (4) Connect the probe at the electrical connector (JN006).
      (5) Attach the electrical connector and wire with the tie straps.
      (6) Install the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.

4. **EGT Probe Removal/Installation (Airplanes with Garmin G1000)**

   A. Remove the EGT Probe (Refer to Figure 202)

      NOTE: The EGT probe is welded to the clamp.

      NOTE: Airplanes with Garmin G1000 have an EGT probe at each cylinder. Removal and installation of the EGT probes are typical.

      (1) Remove the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.

      CAUTION: Make sure the exhaust system and engine are cool before the probes are removed.

      (2) Disconnect the electrical connectors.
      (3) Cut and remove the safety wire from the EGT probe clamp and screw.

(4) Loosen the clamp screw.
(5) Remove the clamp with the attached probe from the exhaust pipe.

B. Install the EGT Probe (Refer to Figure 202).
(1) Attach the clamp with the EGT probe to the exhaust pipe.
(2) Tighten the screw on the clamp
(3) Attach safety wire to the EGT probe clamp and screw.
(4) Connect the electrical connectors.
(5) Attach the connectors together with a tie strap.
(6) Install the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.
(7) Make sure the EGT probe operates correctly. Refer to the Pilot's Operating Handbook.

5. EGT Probe Lead Wire Repair

A. EGT Probe Lead Wire Repair.
(1) Remove the screws to separate the EGT terminal connector housing.
(2) Cut the broken wire to a good termination.
(3) Make both wires the same length.
(4) Remove the insulation to get 1/4 inch of good wire strands.
(5) Replace the terminal connector housing if it is damaged.
(6) Wrap the wire around the terminal screws and tighten the screws.
(a) Make sure to keep the original polarity (red wire to the alumel (negative) terminal, yellow wire to the chromel (positive) terminal).
(7) Make sure the strain relief bracket is installed.

CAUTION: Damage to the lead wire can occur because of engine movement during startup and shutdown if there is not sufficient length in the lead wire.

(8) Make sure the lead wire has sufficient length.
(9) Do an operational check of the EGT indication on the ground.

6. CHT Probe Removal/Installation

A. Remove the CHT Probe (Refer to Figure 202).

NOTE: The CHT probes use a bayonet-style connector.

NOTE: Airplanes with Garmin G1000 have a CHT probe for each cylinder. Removal and installation of the CHT probes is typical.

(1) Remove the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.

CAUTION: Make sure the exhaust system and engine are cool before the probes are removed.

(2) Remove the terminal nut.
(3) Disconnect the terminal from the CHT probe.
(4) Turn the CHT probe to remove from the cylinder head.

B. Install the CHT Probe (Refer toFigure 202).
(1) Install the CHT probe into the cylinder head.
(2) Connect the terminal on the CHT probe.
(3) Install the terminal nut.
(4) Install the engine cowl. Refer to Chapter 71, Engine Cowling - Maintenance Practices.
(5) Make sure the CHT operates correctly. Refer to the Pilot's Operating Handbook.

Lampiran 9 AMM 28-20-00 fuel shutoff valve control cable/arm adjustment.

8. Fuel Shutoff Valve Control Cable/Arm Adjustment

A. Adjust the Fuel Shutoff Cable and Control Arm (Refer to Figure 205).
(1) Remove the copilot seat. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.
(2) Move the footwell carpet away from the copilot's rudder pedal shields to get access to the shield screws.
(3) Remove the screws from the pedal shields.
(4) Remove the pedal shields from the airplane.

(5) Remove the lock nut.

NOTE: Lock nuts can be used again unless they can be run-up finger tight.

NOTE: When fiber-type self-locking nuts are used again, make sure the fiber locking function has not decreased or become brittle.

(6) Remove and replace the washers.
(7) Install the lock nut and tighten to a minimum of 15 inch-pounds to attach the control cable.

NOTE: After the nut is tightened, the swivel clamp must pivot freely in the control arm.

(8) Lubricate the swivel clamp with a dry film lubricant such as Molykote 321.
(9) Make sure the control arm moves smoothly.
(10) Operate the fuel shutoff control cable knob to make sure the fuel shutoff valve control cable/arm connection moves smoothly.
(a) Adjust the control assembly until the connection operates smoothly.
(b) If adjustment does not give smooth operation, replace the assembly and adjust the control assembly until it operates smoothly.
(11) Put the copilot's rudder pedal shields in position and attach with the screws.
(12) Install the footwell carpet.
(13) Install the copilot's seat. Refer to Chapter 25, Front Seats and Rails - Maintenance Practices.

Lampiran 10 Main wheel disassembly and assembly

C. Install the Axle (Alternate Method) (Refer to Figure 201).

NOTE: If the hole diameter in the tubular strut and the axle is more than 0.0023 inch (0.0584 mm) larger than the diameter of the mounting bolt, you can bond the axle to the strut. Do not let the adhesive go into the tubular strut or axle holes, or touch the bolt threads.

(1) Before you install the new axle, clean the outer surface of the tubular strut and the inner surface of the axle with solvent.
   (a) Dry the tubular strut and axle with a clean, lint free cloth immediately.
(2) Mix EA9309 adhesive and apply a thin smooth layer to the outer surface of the tubular strut where the axle will touch.
(3) Install the bolt, washer, and nut that attach the axle to the tubular strut.
(4) Tighten the nut and install the cotter pin. Refer to Chapter 20, Safetying - Maintenance Practices.
(5) Let the adhesive dry for 24 hours at 75°F (24°C) or 30 minutes at 250°F (121°C), if heating equipment is available.
(6) Install the brake components and the speed fairing mounting plate to the axle.
(7) Install the wheel on the axle.
(8) Connect the hydraulic brake line to the wheel brake cylinder.
(9) Fill and bleed the hydraulic brake system. Refer to Brakes - Maintenance Practices.
(10) Install the main wheel speed fairing. Refer to Main Landing Gear - Maintenance Practices.

4. Main Wheel Disassembly/Assembly

A. Disassemble the Wheel (Refer to Figure 202).

WARNING: DO NOT REMOVE THE WHEEL WITH THE TIRE AND TUBE INFLATED WITH AIR. SERIOUS INJURY OR DEATH CAN RESULT.

(1) Fully deflate the tire and tube.

CAUTION: BE CAREFUL TO PREVENT TOOL DAMAGE TO THE TIRE WHEN YOU REMOVE THE TIRE FROM THE WHEEL HALVES.

(2) Break loose the tire bead.
(3) Remove the bolts that attach the wheel halves together.
(4) Separate and remove the tire and tube from the wheel halves.
(5) Remove the retaining rings, grease seal retainers, grease seal felts, grease seal retainers and bearing cones.
(6) The bearing cups (races) are a press fit in the wheel halves and must not be removed unless a new part is to be installed.
   (a) To remove the bearing cups, heat the wheel half in boiling water for 30 minutes or in an oven, not to exceed 250°F (121°C).
   (b) Use an arbor press if available, to press out bearing cup and press in a new bearing cup while the wheel half is still hot.

B. Assemble the Wheel (Refer to Figure 202).
(1) Use grease to prepare the wheel bearing for installation. Refer to Chapter 12, Lubricant - Description and Operation for list of bearing greases.
   (a) Fill the bearing cone with grease.
   (b) Add grease to the bearing seals. If felt seals are used, lightly coat all surfaces of the felt with bearing grease. If rubber seals are used, lightly coat the rubber surfaces with bearing grease.
(2) Install the bearing cone, grease seal retainer, grease seal felt, grease seal retainer and retaining ring into each wheel half.
(3) Install the tube in the tire. Make sure to align the index marks on the tire and tube.
(4) Set the wheel half into the tire and tube (side opposite valve stem).
(5) Install the bolt through the wheel half with a washer under the head of the bolt.

(6) Set the other wheel half into the other side of the tire and tube. Make sure to align the valve stem in the valve slot.
(7) Make sure the tube is not pinched between the wheel halves before you torque the nuts.

CAUTION: MAKE SURE THE NUTS HAVE THE CORRECT TORQUE. THE BOLTS CAN CAUSE DAMAGE OF THE WHEEL IF THE NUTS DO NOT HAVE THE CORRECT TORQUE.

CAUTION: DO NOT USE IMPACT WRENCHES ON THE BOLTS OR NUTS.

(8) Install the washers and nuts on the bolts.
(9) Tighten the nuts to a dry torque of 90 inch-pounds, +2 or -2 inch-pounds (10.17 N.m, +0.23 or -0.23 N.m).
(10) Inflate the tire to seat the tire beads.
(11) Adjust the air in the tire to the correct pressure.

5. Main Wheel Inspection/Check

A. Remove the Wheel. Refer to Main Wheel Removal/Installation.

B. Disassemble the Wheel. Refer to Main Wheel Disassembly/Assembly.

C. Inspect the Main Wheel (Refer to Figure 202).
(1) Clean all metal parts and grease seal felts in solvent, and dry thoroughly.

NOTE: A soft bristle brush can be used to remove hardened grease, dust or dirt.

(2) Examine the wheel halves for cracks or damage.
(3) Examine the bearing cones, cups, retaining rings, grease seal retainers, grease seal felts and grease seal retainers for wear or damage.
(4) Examine the bolts for cracks in the bolt head.
(5) Replace the wheel half if it is cracked or damaged.
(6) Replace damaged retainer rings and seals.
(7) Replace worn or damaged bearing cups and cones.
(8) Replace any worn or damaged bolts.
(9) Remove any corrosion or small nicks with a minimum of 320 grit sandpaper.
(10) Clean and paint repaired areas with a layer of clear lacquer paint. Refer to Chapter 20, Interior and Exterior Finish - Cleaning/Painting.
(11) Pack the bearings with MIL-PRF-81322 wheel bearing grease.

D. Assemble the Wheel. Refer to Main Wheel Disassembly/Assembly.

E. Install the Wheel. Refer to Main Landing Gear Wheel Removal/Installation .

6. Wheel Balancing

A. Tire wear that is not equal is usually the result of the wheel not correctly balanced. Replacement of the tire will usually correct the condition.
(1) The light weight point of the tire is marked with a red dot on the tire sidewall. The heavy weight point of the tube is marked with a contrasting color line (usually near the inflation valve stem). When you install a new tire, set the marks adjacent to each other. The wheel can be statically balanced but not dynamically balanced if a wheel shows indication of unbalance when you service it.

NOTE: Static balance is the balance of the control surface, which is balanced from its hinge point. A tire that is not dynamically balanced will cause vibration and can be examined when the tire rotates.